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**Report from the Commission to the European Parliament and the Council
assessing Member States' programmes of measures under the Marine Strategy
Framework Directive**

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Abbreviations

BWMC	Ballast Water Management Convention
CFP	Common Fisheries Policy
EIA	Environmental Impact Assessment
EQS	Environmental Quality Standards
GES	Good Environmental Status
GFCM	General Fisheries Council for the Mediterranean
HELCOM	Convention on the Protection of the Marine Environment of the Baltic Sea Area
ICCAT	International Commission for the Conservation of Atlantic Tuna
IED	Industrial Emissions Directive
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
NEC	National Emissions Ceiling Directive
OSPAR	Convention for the Protection of the marine environment of the North-east
RBMP	River Basin Management Plan
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SEA	Strategic Environmental Assessment
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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PART I — SUMMARY FINDINGS AND RECOMMENDATIONS PER MEMBER STATE ON PROGRAMMES OF MEASURES, REPORTED UNDER ARTICLE 13(9) OF DIRECTIVE 2008/56/EC

The technical assessments¹ on which this part of the annex is based analyse Member States' reporting of their programmes of measures per descriptor, under Article 13(9) of Directive 2008/56/EC². This part of the annex provides a summary assessment of how Member States cover pressures³ on the marine environment in their programme of measures, based on the descriptors identified in Annex I of the Marine Strategy Framework Directive⁴. For each of these descriptors, this part of the annex draws conclusions on the strengths and weaknesses that have been identified across the EU, while providing some recommendations for Member States to consider by the next update of their programmes of measures, or for other parts of their marine strategy.

Methodology: Member States' programmes of measures were assessed by considering whether they addressed the relevant pressures and associated activities in a marine region. By addressing the right pressures, Member States would be in a position to move closer towards achieving good environmental status (GES) within the timeline set by the Marine Strategy Framework Directive (MSFD). The assessment was based on the information reported by Member States. 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. However this assessment due to lack of information reported by

¹ The technical Member State-specific assessments were prepared for the Commission by an external consultant and are found at http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/implementation/reports_en.htm

² 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.

³ 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 enter into that assessment given defence activities are excluded from the scope of the directive (Article 2(2)).

⁴ The 11 qualitative descriptors are defined in Annex I of 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 associated to a number between 1 and 11. The numbers refer to the respective numbered points in Annex I of 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 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).

Member States has not been able to assess whether the measures will sufficiently reduce the pressures and impacts and thereby achieve good environmental status. The outcome of the assessment is therefore partly dependent on the ambition level of the Member State's determination of their GES and targets. The high-level results are presented in the Commission's report⁵. This annex further develops the assessment of the main components of Member States' programmes in relation to the pressures reported. It moreover looks at the exceptions that were 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?

The coherence of the measures in the coverage of pressures and associated activities for non-indigenous species (D2) is assessed to be *moderate to high* across the EU.

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 if shipping via anti-fouling measures is addressed.
	EE		
	LV	Partially addressed	Aquaculture is addressed. Shipping is addressed both indirectly and in the future. Latvia reports that the specific measures to reduce non-indigenous species introductions through shipping will be determined once the Ballast Water Management Convention (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		
	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.

⁵ Report from the Commission to the European Parliament and the Council assessing member States' programmes of measures under the Marine Strategy Framework Directive, COM(2018)393

Region	Member State	Assessment against pressures	Explanation
	DK		
	SE	Partially addressed	Aquaculture and shipping are addressed. On 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. On shipping, while ballast water management measures are reported; anti-fouling measures do not appear to be included in the Swedish programme.
	DK		
	DE	Addressed	Aquaculture, shipping and fishing are addressed.
	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 on 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. On shipping, while ballast water management measures are explicitly reported, it is not clear if bio-fouling is covered.
	IT	Addressed	Aquaculture, fisheries and shipping are addressed.
	MT	Addressed	Aquaculture, shipping and recreational yachting

Region	Member State	Assessment against pressures	Explanation
			are addressed.
	HR		
	SI		
	EL		
	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		

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

Conclusions

D2 — Non-indigenous species	
Strengths	New introductions of non-indigenous species are addressed by almost all Member States.
	Efforts focus on addressing this pressure from shipping through ballast water management efforts (most link to the BWMC) and from aquaculture (wherever relevant).
	Several Member States report early warning systems of non-indigenous species introductions as measures linked also to contingency plans.
	Some Member States also report efforts to remove existing non-indigenous species (although how effective these may be remains unclear).
	Most Member States include measures that are based on commitments to existing policies and legislation and therefore there is a certain degree of coherence across the programmes of measures.
	Several Member States also report research effort to better understand the impact of non-indigenous species in the environment.
	Member States that have applied for an exception under Article 14(1)(a) have provided grounded justifications for doing so (e.g. non-indigenous species introductions via neighbouring waters outside of the EU are considered beyond control of Member States).
Weaknesses	The pressure of introduction of non-indigenous species from shipping is not always fully covered, as bio-fouling is not always reported, and hull cleaning is a measure in some but not the majority of the Member States' programmes of measures.
	Transboundary aspects of this pressure and their influence on non-indigenous species introductions are mentioned by some but not the majority of Member States.

D2 — Non-indigenous species	
	<p>A number of programmes include monitoring as a measure A few Member States only report their monitoring efforts as their measures to address non-indigenous species. These are not considered to contribute to achieving targets and GES for D2.</p>
	<p>Some measures proposed by few Member States are not described clearly enough to understand how they will contribute to achieving GES and targets for D2, particularly those measures that involve developing action plan(s) to address the introduction of non-indigenous species which is what the programme should be doing.</p>
Recommendations	<p>Member States should address shipping and recreational vessels better, by including measures also targeting bio-fouling and not just ballast water management.</p>
	<p>Member States should clarify any measures that involve developing action plan(s). When not provided for, Member States should consider developing non-indigenous species early warning systems and contingency plans linked to them and registries as part of their measures. Studies assessing the impact of removal efforts should be put in place to determine their effectiveness.</p>

2. DESCRIPTOR 3 — COMMERCIAL FISH AND SHELLFISH

Have the pressures been covered by Member States?

The coherence of the measures in the coverage of pressures and associated activities for commercial fish and shellfish (D3) is assessed to be **high** across the EU.

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		
	LV	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	LT		
	PL	Partially addressed	Commercial and potentially recreational fishing is addressed. It does not address the activities related to seaweed and other sea-based food harvesting despite Poland having reported these as activities causing pressure 'extraction of species'.
	DE	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	DK		
	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.
	DK		
	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 checked.
	BE	Partially addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities. Aquaculture which is identified as a

Region	Member State	Assessment against pressures	Explanation
			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) is not 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 subregion) are also included.
	PT	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
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

Region	Member State	Assessment against pressures	Explanation
			activities.
	HR		
	SI		
	EL		
	CY	Partially addressed	Commercial fisheries for national stocks and recreational fisheries are addressed. However, Cyprus does not link its programme to the Common Fisheries Policy (CFP) ⁶ . 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		

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

Conclusions

D3 — Commercial fish and shellfish	
Strengths	The pressure ‘Extraction of species — fish and shellfish’ is consistently identified — as expected — as the main pressure on commercial fisheries, with ‘fisheries including recreational fishing’ as the main activity contributing to this, and all Member States address this pressure and activity (to varying degrees) in their programmes of measures.
	The majority of Member States consistently link their MSFD programmes to the CFP, ensuring a high level of coherence at EU level.
	The majority of Member States consistently link their programmes to Regional Fisheries Management Organisations (when available), ensuring coherence at the regional level.
	Many Member States report measures addressing recreational fishing in addition to commercial fishing (e.g. transition of recreational fishermen to commercial fishermen, controls on level of recreational fishing).
	Several Member States propose seasonal and 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.
	A few Member States also report awareness raising efforts on the state of fish stocks, targeting the public (consumers) in order to influence demand of certain fish.

⁶ 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.

	<p>All waters are generally covered, even beyond the Exclusive Economic Zone (activities of the Member States' commercial fleet, regardless of where they are operating).</p> <p>Member States that have applied for an exception under Article 14(1)(a) or Article 14(1)(e) have provided grounded justifications for doing so (e.g. will take time for stocks to respond to changes in exploitation rates and for biomass to increase to the targeted levels).</p>
Weaknesses	Recreational fishing is not always addressed by Member States where it may exert a significant pressure on stocks.
	Some programmes lack sufficient detail to determine whether stocks that are managed on a national level are addressed by the measures.
	Age/size structure is not always addressed in the programmes of measures.
Recommendations	Member States should establish measures to address recreational fishing, where it exerts a significant pressure on stocks, if they have not already done so.
	Member States should ensure that measures comprehensively address nationally-managed stocks (inshore stocks, shellfish) as well as stocks managed through the CFP.
	Member States should ensure that age/size structure is taken into account and addressed where required.

3. DESCRIPTOR 5 — EUTROPHICATION

Have the pressures been covered by Member States?

The coherence of the measures in the coverage of pressures and associated activities for eutrophication (D5) is assessed to be *moderate to high* across the EU.

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		
	LV	Addressed	Agriculture/forestry and urban areas are addressed.
	LT		
	PL	Partially addressed	Agriculture, urban areas and industry are addressed, but solid waste disposal and fishing are not (reported by the Member State as relevant to Polish marine waters).
	DE	Addressed	Agriculture/forestry, urban areas, industry and shipping are addressed.
	DK		
	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.
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		
	DE	Addressed	Agriculture/forestry, urban areas, industry, and shipping are addressed.
	NL	Addressed	Agriculture/forestry, urban areas, industry, and shipping are addressed.
	BE	Partially	Urban areas are addressed. Agriculture and

Region	Member State	Assessment against pressures	Explanation
		addressed	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, is not 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, are not 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, is not addressed.
	PT	Partially addressed	Agriculture is partly addressed by Water Framework Directive (WFD) ⁷ measures and Maritime Spatial Planning (MSP) measures. Other measures aim to identify gaps, share data, revise monitoring programmes to collect more useful, cost-effective data, etc. These actions will have no direct effects on pressures but is rather contributing 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, is not addressed.
	FR	Partially addressed	Agriculture, urban areas, shipping and industry are addressed. Aquaculture and recreational activities, identified as relevant by France in Article 8, are not 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. In relation to the measure

⁷ 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.

Region	Member State	Assessment against pressures	Explanation
			on waste water, there is currently an infringement case on the performance of the plants in the framework of the Urban Waste Water Treatment Directive (UWWTD) ⁸ . 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 those plants.
	HR		
	SI		
	EL		
	CY	Addressed	Agriculture, urban areas, industry, aquaculture and shipping are addressed.
Black Sea	BG	Partially addressed	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.
	RO		

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

Conclusions

D5 — Eutrophication	
Strengths	Member States report measures that are consistently based on the WFD. Measures for eutrophication draw from Member States' River Basin Management Plans. Under 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 (i.e. mainly agriculture, industry, waste water and flood risks). However, considering the extent to which the MSFD programme relies on WFD measures, this statement is true provided that the River Basin Management Plans (RBMPs) are assessed as adequate under the upcoming WFD assessment.
	Most Member States also utilise synergies with the UWWTD, the Nitrates Directive, Industrial Emissions Directive, the National Emission Ceilings Directive, and the processes through the Regional Sea Conventions.
	For most if not all Member States, the achievement or not of 'Good' or higher status in WFD coastal waterbodies appears to have been the principal factor determining whether new measures were developed for the MSFD.
	Most Member States refer to the International Maritime Organisation (IMO)

⁸ Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment, OJ L 135, 30.5.1991, p. 40.

D5 — Eutrophication	
	(MARPOL)) legislation when regulating shipping, particularly on NO _x emissions.
Weaknesses	Member States that have applied for an exception under Article 14(1)(a), (b), (e) or Article 14(4) have not always provided fully grounded justifications for doing so (e.g. even if the nutrient load targets are reached, recovery of the state of the marine environment will take a long time because the concentrations in marine waters can persist for a very long time).
	Some Member States do not address atmospheric deposition of nutrients.
	Most Member States do not consider additional aspects, such as improved aquaculture management practices.
Recommendations	Member States should establish measures that consider nutrient inputs from atmospheric deposition and, where relevant, aquaculture.
	If applied, exceptions should be justified better.

4. DESCRIPTOR 7 — HYDROGRAPHICAL CHANGES

Have the pressures been covered by Member States?

Coherence of the measures in the coverage of pressures and associated activities for hydrographical changes (D7) is assessed to be *moderate* across the EU.

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 ⁹ and SEA ¹⁰ 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 is not clear if and how cumulative impacts are addressed.
	EE		
	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 to hydrographical changes as relevant in its Article 8 report due to a lack of existing data. As such, the programme does not address relevant D7 pressures.
	LT		
	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 measures to address the pressures. The activities of waste disposal, shipping and tourism are not addressed. It is also 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.

⁹ 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.

¹⁰ 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
			Measures refer to the implementation of the EIA and SEA Directives. Germany addresses cumulative impacts which is positive.
	DK		
	SE	Addressed	Measures link to the implementation of MSP, water regulations, and 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 in its marine waters (in either of its subregions), it defined existing and new measures to tackle this issue. One of the new measures particularly targets urban activities. It is not clear if and how cumulative impacts are addressed.
North-East Atlantic Ocean	SE	Addressed	Measures link to the implementation of MSP, water regulations, as well as the Swedish 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 in its marine waters (in either of its subregions), it defined existing and new measures to tackle this issue. One of the new measures particularly targets urban activities. It is not clear if and how cumulative impacts are addressed.
	DK		
	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.

Region	Member State	Assessment against measures	Explanation
	BE	Partially addressed	No measures are reported specifically for hydrographical changes (D7). Nevertheless, Belgium reports a WFD measure that may address D7 in the coast (where most hydrographical changes occur), although, given the level of detail reported, this cannot be checked.
	UK	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 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 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 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 is not clear if and how cumulative

Region	Member State	Assessment against measures	Explanation
			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 measure about desalination in the Mediterranean Sea has been reported (an activity identified by Spain as relevant to its Mediterranean water). 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 powerplants (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 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 is not clear if and how cumulative impacts are addressed.
	HR		
	SI		
	EL		
	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

Region	Member State	Assessment against measures	Explanation
			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 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 is not clear if and how cumulative impacts are addressed.
	RO		

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

Conclusions

D7 — H hydrographical changes	
Strengths	Most Member States refer to existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes.
	Most Member States use synergies with the EIA and SEA Directives, as well as with the WFD.
	Desalination activities are also addressed by all Member States where this is relevant.
Weaknesses	Most Member States do not explain how they 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 most Member States.
	As there is much overlap with the WFD in coastal waters, some Member States tend to consider — without sufficient justification — that MSFD requirements (of achieving GES and targets) can be fully met by WFD measures only. Very often, Member States just transfer these measures to the MSFD programme but do not clearly explain how these will contribute to meeting MSFD objectives.
	Many national initial assessments show that past and existing activities did and do impact GES. There is a strong trend in the programmes to consider that the present state is at GES, and as such to focus measures to address only new activities and projects, without assessing the scale of past impacts.

D7 — Hydrographical changes

	<p>Few measures have been reported to address hydrographical changes beyond new individual projects. Most measures focus on implementing EIA procedures, and less so SEA procedures. MSP and Integrated coastal zone management processes could also contribute to D7, but are not referred to by most Member States.</p>
Recommendations	<p>Member States should use synergies with MSP for addressing cumulative impacts for D7.</p>
	<p>Member States should address pressures from activities not subject to local/project scale EIAs (e.g. fishing, maritime transport) better. In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.</p>
	<p>Member States 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.</p>

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

Have the pressures been covered by Member States?

Coherence of the measures in the coverage of pressures and associated activities for contaminants (D8) is assessed to be *moderate to high* across the EU.

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 report), 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 for shipping and accidental pollution are reported.
	EE		
	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		
	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 source of synthetic compounds, and shipping, responsible for accidental pollution, are addressed. Various other activities are also covered (e.g., marine mining or urban activities).
	DK		
	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 checked 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

Region	Member State	Assessment against pressures	Explanation
			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 checked based on the information reported.
	DK		
	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 or atmospheric

Region	Member State	Assessment against pressures	Explanation
			deposition are not addressed. 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		
	SI		
	EL		
	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.

Region	Member State	Assessment against pressures	Explanation
	RO		

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

Have the pressures been covered by Member States?

Coherence of the measures in the coverage of pressures and associated activities for contaminants in seafood (D9) is assessed to be **high** across the EU.

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 report), 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 for shipping are reported.
	EE		
	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		
	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 activities such as agriculture and fisheries as relevant sources of hazardous compounds are also covered.
	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		
	SE	Partially addressed	Sweden reports the same set of measures for D8 and D9. Industry, urban activities and shipping are

Region	Member State	Assessment against pressures	Explanation
			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 checked 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 checked based on the information reported.
	DK		
	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 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, as well as fisheries 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.
	ES	Addressed	Spain reports the same set of measures for D8 and D9, except one existing D9-specific measure. Industry, agriculture, urban activities, port

Region	Member State	Assessment against pressures	Explanation
			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 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, are not 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		

Region	Member State	Assessment against pressures	Explanation
	SI		
	EL		
	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 however does not focus on a specific activity).
Black Sea	BG	Partially addressed	Industry, agriculture, urban activities, port 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		

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

Conclusions

D8 and D9 — Contaminants and contaminants in seafood	
Strengths	Contaminants in the sea are addressed by all Member States through measures that target land-based (e.g. industry, urban areas), as well as sea-based sources (e.g. shipping).
	Most Member States address accidental pollution. Measures link to the International Convention for the Prevention of Pollution from Ships (IMO-MARPOL).
	Most Member States make use of synergies with existing legal acts targeting contamination which are extensively referenced in their programmes of measures (i.e. WFD, National Emission Ceiling Directive, Industrial Emissions Directive, Urban Waste Water Treatment Directive and EC Regulation on the prohibition of organotin compounds on ships among others ¹¹).
	For D9, Member States have a coherent approach in the way they address this descriptor. Most Member States do not report D9 specific measures, but rather refer to their D8 measures that are relevant to D9 as well. This approach is logical (as log as seafood origin can be traced to a specific area), as reducing the input levels of contaminants to the sea will inevitably reduce the level of contaminants in seafood.
	For D9, Member States that have applied for an exception under Article 14(1)(a) and (e) have provided fully grounded justifications for doing so (e.g. concentrations of hazardous substances in marine waters from transboundary sources. The issue cannot be solely addressed by a single Member State's programme of measures).

¹¹ They correspond to, respectively, Directives 2000/60/EC, 2016/2284/EU, 2010/75/EU, 91/271/EEC, and Regulation (EC) No 782/2003.

D8 and D9 — Contaminants and contaminants in seafood

Weaknesses	Unlike other sources of contaminants, most Member States do not address atmospheric deposition ¹² . The Member States that address this type of pollution mainly refer to the Industrial Emissions Directive and the National Emission Ceiling Directive.
	Some but not all Member States address biological effects by contaminants.
	For D9, most Member States do not make sufficient references to relevant EU policies such as EU rules on setting maximum levels for certain contaminants in foodstuffs. In addition, most Member States do not explain how their D8 measures will contribute in addressing pressures for D9 ¹³ .
	For D8, Member States that have applied for an exception under Article 14(1)(a), (e) or Article 14(4) have not always provided fully grounded justifications for doing so (e.g. few highlight historical contamination, others refer to transboundary sources of contaminants, while one refers to disproportionate costs of removing contaminants).
Recommendations	Member States should address atmospheric deposition (from sea-based and land-based sources) better.
	The manner in which the D8 measures contribute to D9 targets should be better explained in the Member State programmes.
	If applied, exceptions should be justified better.

¹² However, atmospheric deposition is indirectly reduced when reducing some land sources.

¹³ They correspond to, respectively, Regulation (EC) 1881/2006 and Regulation (EU) 589/2014.

6. DESCRIPTOR 10 — MARINE LITTER

Have the pressures been covered by Member States?

Coherence of pressures addressed by the programmes for marine litter (D10) is assessed to be *moderate to high* across the EU.

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		
	LV	Addressed	Even though marine litter has not been reported as a pressure in Latvia's Article 8 report, retail sector, tourism/recreation activities and shipping are addressed. Micro-litter is indirectly addressed.
	LT		
	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		
	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).
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		
	DE	Addressed	Fisheries, offshore structures, and shipping are addressed. Micro-litter is addressed through measures on several activities, including urban

Region	Member State	Assessment against pressures	Explanation
			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 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-

Region	Member State	Assessment against pressures	Explanation
			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		
	SI		
	EL		
	CY	Partially addressed	Urban and tourism/recreational activities are addressed. Industry and shipping are not addressed. It is not clear if micro-litter is addressed (no data).
Black Sea	BG	Addressed	Fisheries, urban activities, and shipping are addressed. It is not clear if micro-litter is addressed (no data).
	RO		

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

Conclusions

D10 — Marine litter	
Strengths	Measures cover both the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. Efforts are mostly directed towards macro-litter, through measures such as the introduction of tracking devices on fishing nets to avoid having them lost in the sea, banning the use of plastic bags, the organisation of beach clean-up days and fishing for litter initiatives targeting fisherman.
	Most Member States report measures that are linked with regional actions and coordinated by contracting parties of relevant Regional Sea Conventions. These mostly link to regional action plans for litter, such as under OSPAR, HELCOM and UNEP/MAP.
	Most Member States also report awareness raising efforts targeting not just the public, but also professional sectors that can be a source of litter (e.g. fishermen)
	Transboundary impacts of marine litter are acknowledged by most Member States.
	All Member States are aware of the problem of marine litter, including micro-litter, and most Member States have a good understanding of the main sources contributing to this problem.

D10 — Marine litter

D10 — Marine litter	
Weaknesses	Micro-litter is not yet fully covered by all Member States. Some report indirect measures to address knowledge gaps for this type of litter, which while not yet fully addressing the problem, will positively contribute to better characterising the pressure and its potential impact on fauna. Very few Member States report direct measures on micro-litter.
	Although many Member States refer to ‘degradation products’ in their GES and target definitions (in a general way), no direct measures are in place to tackle these degradation products.
	Due to the lack of knowledge and reporting on the effects of marine litter on biota, it is often unclear how Member States will interpret the issue of ‘not cause damage on the marine environment’ or ‘significant impacts on the marine ecosystem’, even though these aspects have been included in many of the GES definitions or in specific targets.
	Even though transboundary impacts of marine litter are acknowledged by most Member States, no specific actions (e.g. governance efforts) are reported.
	One Member State applied for an exception under Article 14(1)(a) but did not provide a fully grounded justification for doing so (transboundary nature of marine litter not sufficiently explained).
Recommendations	Member States should address micro-litter better, through direct measures, in addition to indirect measures, in line with recommendations of TG Litter ¹⁴ , to ensure coherence of approaches at the EU level.
	Member States should establish additional research efforts to address data gaps, increase knowledge and pave the way for direct action to address this litter segment as soon as possible.
	Member States should develop efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, aquaculture, etc.).
	Member States should develop targeted measures for products responsible for beach litter coming from both sea-based and land-based sources (such as single-use plastic items).

¹⁴ The technical group ‘TG Litter’ is a subgroup of the MSFD expert group, which provides a forum for the MSFD Common Implementation Strategy.

7. DESCRIPTOR 11 — UNDERWATER NOISE & ENERGY

Have the pressures been covered by Member States?

Coherence of programmes in the coverage of pressures and associated activities for underwater noise and energy (D11) is assessed to be *low to moderate* across the EU.

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Partially addressed	Shipping is addressed. Port operations are indirectly addressed.
	EE		
	LV	Partially addressed	The programme includes one indirect measure. Latvia does not report underwater noise as a pressure in 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		
	PL	Partially addressed	Shipping is addressed. Marine based renewable energy generation, 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 characterise 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 energy generation, industry, submarine cable/pipeline operations and offshore activities.
	DK		
	SE	Partially addressed	Marine based renewable energy generation, fisheries, offshore activities, marine research and shipping are indirectly addressed through knowledge increase efforts 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 knowledge increase

Region	Member State	Assessment against pressures	Explanation
			efforts and coordination actions. These will contribute to better understanding the pressures.
	DK		
	DE	Addressed	Marine based renewable energy generation, marine hydrocarbon extraction, fisheries, marine mining, defence operations, 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 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 is also not 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

Region	Member State	Assessment against pressures	Explanation
			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 Appropriate assessments (AA) measures will contribute to reducing noise pressures, but they will not be 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		
	SI		
	EL		
	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 characterise them, understand risks and define thresholds at the EU/(sub)regional level.
	RO		

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

Conclusions

D11 — Underwater noise and energy	
Strengths	Most Member States report research efforts, which aim to collect additional data and conduct studies to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with the TG Noise recommendation ¹⁵ .
	Some Member States have started addressing impulsive noise through measures directly targeting this pressure.
	Few Member States have also reported measures tackling other energy inputs (such as heat and light).
	Most Member States report measures that aim to implement a register for impulsive sounds.
	Some Member States have started monitoring initiatives to model / measure continuous noise, which can be seen as a progress.
	The pressure of underwater noise is at least partially addressed by most Member States. Activities covered include shipping, renewable energy generation, hydrocarbon extraction, seismic studies and marine research.
Weaknesses	The programmes of Member States are often very unclear concerning D11. It is often difficult to distinguish between planned measures and those already undertaken. Much of what is being described appears to be intentions for future actions.
	Few Member States have established synergies with existing legal acts. Some measures refer to the implementation of EIA procedures.
Recommendations	Member States should make more efforts to address data gaps and consolidate research results to move closer to characterising the noise pressure across the EU (or (sub)regionally), in line with the TG Noise recommendation. This will allow them to then define more concrete and direct measures to address underwater noise in the second MSFD implementation cycle.
	Member States should establish direct measures to address activities that are known to produce high levels of noise, as soon as possible.
	All Member States not having done so should establish a register for impulsive low-mid frequency noise. Those Member States should also ensure that data gaps are addressed for continuous low frequency sounds in line with TG Noise recommendations, to ensure coherence of approaches at the EU level.
	Member States should also establish measures that address additional aspects of this descriptor, such as heat and light.
	Member States should more consistently use synergies with relevant existing EU legal acts, such as the EIA Directive; as well as implement measures in line with relevant IMO guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.

¹⁵ The technical group ‘TG Noise’ is a subgroup of the MSFD expert group, which provides a forum for the MSFD Common Implementation Strategy.

8. DESCRIPTORS 1, 4, 6 — BIODIVERSITY

i. General biodiversity

The coherence of the programmes in addressing biodiversity is detailed in the respective sections for birds, fish and cephalopods, mammals and reptiles, water column habitats and seabed habitats.

Conclusions

D1, 4, 6 — General biodiversity	
Strengths	Member States' programmes of measures for the Descriptor themes of birds, mammals and reptiles (D1, 4) and seabed habitats (D1, 4, 6) are mostly coherent.
	Pressures are covered within the programmes, in particular for the priority pressures for particular species groups and habitats, such as by-catch (birds, mammals), noise (mammals) and trawling (seabed habitats).
	The majority of Member States use synergies with the Birds and Habitats Directive, by including relevant measures from these legal acts into their MSFD programmes. Some Member States also refer to the WFD and the CFP.
Weaknesses	The programmes of Member States for the Descriptor themes of fish and cephalopods (when relevant) (D1, 4) and water column habitats (D1, 4) are moderately coherent.
	Pressures of by-catch are addressed for fish and cephalopods, yet most Member States focus on commercial species, rather than a broader range of species. Member States do not explicitly report which measures in their programmes will contribute to addressing pressures on water column habitats. It is thus not always clear how measures will contribute to progress towards targets and GES (as defined by each Member State).
	For the most part, D4 is considered in measures related to specific species (indicator species). There is little consideration to the broader functioning of the foodweb, which would logically consider key species or functional types at various trophic levels. In some instances, this information is being gathered as part of D1, but is not considered within the framework of D4. Some Member States indicate that they do not currently know enough about the functioning of the foodweb to develop meaningful measures.
	Although links with existing legislation, conservation initiatives and projects are made, there is little linkage provided between the biodiversity descriptors and relevant pressure descriptors, which makes it difficult to assess whether certain pressures that affect biodiversity are being sufficiently addressed. In the case of non-indigenous species, for example, there is rarely any cross-referencing between strategies to address impacts of non-indigenous species within the biodiversity descriptors. Eutrophication also requires further synthesis within the biodiversity framework. Other important descriptors not considered within the framework of the biodiversity descriptors include contaminants and marine litter.
	There is rarely enough information within the programmes to determine progress towards 'addressing' pressures (i.e. stopping the pressure from damaging key features). Most measures indicate that actions to 'address' pressures will likely continue beyond 2020, but do not specify a timeline.

D1, 4, 6 — General biodiversity

	<p>The spatial measures reported do not always provide clear and specific information of the management efforts that were/are expected to be put in place. 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. Links with the other measures in the Member States' programmes is not always evidenced either.</p> <p>Data gaps are normally defined in the measures for biodiversity descriptors and it is stated that the time required to conduct research and fill the identified gaps will subsequently move the achievement of GES beyond the 2020 target and into subsequent cycles.</p> <p>There are also many inconsistencies between targets, GES definitions and the programmes of measures; some examples include indicator or protected species being identified for protection in the GES and targets, which are not specifically discussed within the programmes.</p> <p>In a number of instances for the biodiversity descriptors the targets do not adequately link with the programmes, making an assessment of progress towards GES very difficult in the future. In some instances, it appears that a completely different method of ecological appraisal has been developed for the targets and for the programmes. An example of this is the reference to target or indicator species within the targets, which are subsequently not referenced again within the programmes.</p> <p>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 the potential benefits on species groups and habitats. Furthermore, some Member States do not have a sufficient distribution of MPAs (particularly into open sea areas away from the coast).</p>
Recommendations	<p>Member States should consider establishing additional measures beyond spatial protection efforts to address species and habitats. It is important that pressures are addressed across the broader territory of each Member State.</p> <p>Member States should more clearly explain how measures for species groups contribute to D4, D3 and D6 (and vice versa). Clearer reporting on D4 in the future would improve the understanding on how food webs in particular are addressed by the programme.</p> <p>Member States should provide more specific information on measures for the biodiversity descriptors, in terms of what will be done to ensure that GES will be achieved by 2020 and if not, how and when GES is to be achieved beyond the 2020 target.</p> <p>Member States should provide more information on estimating the reductions of pressures that are expected from the measures and how this will benefit species and habitats. Many of the monitoring programmes included detailed ecological information on the dynamics of species and habitats and deviations from natural trends and it is important that this information is put in context with the programmes and when such measures will allow for GES to be achieved for species and habitats.</p>

ii. D1, 4 Birds

Have the pressures been covered by Member States?

Coherence of the programmes in the coverage of pressures and associated activities for birds (D1, 4) is assessed to be *moderate to high* across the EU.

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		
	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		
	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		
	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		
	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, 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

Region	Member State	Assessment against pressures	Explanation
			protection measures will reduce pressures on bird habitats. Visual light disturbance is indirectly addressed. Also, the measures cover impacts from non-indigenous species.
	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 in 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 subregion. 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		
	SI		
	EL		
	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

Region	Member State	Assessment against pressures	Explanation
			protection measures will reduce pressures on bird habitats.
	RO		

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

Conclusions

D1, 4 — Birds	
Strengths	By-catch for birds is addressed by almost all Member States through fisheries management measures.
	Several Member States complement their direct measures with indirect measures on awareness-raising on the impact of by-catch on birds for stakeholders of the fisheries industry and the general public.
Weaknesses	Only certain Member States address pressures beyond by-catch for birds, covering physical disturbances such as light pollution, oil pollution, effects of non-indigenous species on seabirds, the disturbance of nesting sites by predation, noise, contaminants and litter ingestion.
	Overall, birds are the most studied species group. However, bird food sources have been poorly addressed in the programmes.
Recommendations	Member States should consider establishing additional measures to address pressures on birds beyond by-catch (e.g., light and noise disturbances, disturbances on nesting sites by predation, effects of non-indigenous species, contaminants, and litter ingestion), if not already done so.

iii. D1, 4 Fish and cephalopods

Have the pressures been covered by Member States?

Coherence of the programmes in the coverage of pressures and associated activities for fish and cephalopods (D1, 4) is assessed to be *moderate to high* across the EU.

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		
	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.
	LT		
	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		
North-East Atlantic	SE	Addressed	The pressure extraction of species from commercial fisheries and hunting is addressed. Contaminants and eutrophication are addressed for fish.
	DK		
	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.

Region	Member State	Assessment against pressures	Explanation
			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. elasmobranches 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. But, illegal fishing activities, which cause by-catch for fish, are not addressed.
	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

Region	Member State	Assessment against pressures	Explanation
			pressures such as changes to hydrological processes and contaminants, but claims to cover these under D7 and D8.
	HR		
	SI		
	EL		
	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.
	RO		

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

Conclusions

D1, 4 — Fish and cephalopods	
Strengths	Some Member States complement commercial fish and shellfish (D3) measures with spatial protection measures aiming to also protect non-commercial species.
	In addition to protecting fish species, some Member States also protect functional fish habitats through spatial protection measures.
Weaknesses	Overall, fish are considered to have the weakest coverage of the biodiversity species groups. Most targets and GES definitions consider non-commercial fish species in their text, but only limited actions are provided in the measures (beyond those for commercial stocks).
	The programmes of measures do not include specific measures or plans for cephalopod species.
	Commercial fish species are more broadly considered within the programmes through measures under the CFP, and the Member States make only limited reference to non-commercial fish stocks (and cephalopods when applicable).
	In addition, further MPAs need to be considered for open sea areas to protect non-commercial fish and cephalopods species and their habitats from pressures that affect them such as non-indigenous species, by-catch, noise and contaminants. Even though area-based protection is considered within the programmes, there is little information on where fish and cephalopod species present within Member States' territorial waters are protected and how they are protected.
	Member States that have applied for an exception under Article 14(1)(e) have not always provided fully grounded justifications for doing so (e.g. time-lags for biomass increase but details are missing).

Recommendations	<p>Member States should establish measures that extend beyond CFP, Habitats Directive and WFD related efforts, and address additional fish and cephalopod species, which are non-commercial species in open sea areas. The Member States should therefore establish more measures targeting non-commercial fish and cephalopods (when relevant) in these areas.</p>
	<p>Member States should establish measures that include additional MPAs in open sea areas to protect non-commercial fish and cephalopods species from various pressures (non-indigenous species, by-catch, noise and contaminants). Information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial) and cephalopods species should be more clearly reported where fish and cephalopods species occur within Member States' territorial waters, are protected and how they are protected.</p>

iv. D1, 4 Mammals and reptiles

Have the pressures been covered by Member States?

Coherence of the programmes in the coverage of pressures and associated activities for mammals and reptiles (D1, 4) is assessed to be *moderate* across the EU.

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		
	LV	Partially addressed	By-catch from fisheries is indirectly addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats.
	LT		
	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.
	DE	Addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats. Underwater noise is addressed.
	DK		
	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		
	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 addressed	By-catch from fisheries is addressed. But, underwater noise and other shipping impacts on mammal habitats are not covered.
	UK	Addressed	By-catch from fisheries is addressed. Also,

Region	Member State	Assessment against pressures	Explanation
			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, as well as impacts from tourism and mortality of cetaceans from collisions with ships are addressed. Only impulsive underwater noise (seismic activities) is covered and continuous noise (from shipping) is not.
	HR		
	SI		
	EL		
	CY	Partially addressed	By-catch of turtles from fisheries is not addressed. Spatial protection measures will reduce pressures

Region	Member State	Assessment against pressures	Explanation
			on mammal and turtle habitats. Underwater noise will be addressed.
Black Sea	BG	Partially addressed	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.
	RO		

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

Conclusions

D1, 4 — Mammals and reptiles	
Strengths	By-catch from fisheries activities affecting mammals and reptiles (where relevant) is addressed by all Member States.
	Most Member States also report spatial protection measures to address several pressures such as underwater noise due to shipping, by-catch and habitat damage/loss.
	Furthermore, several Member States go beyond by-catch, and also address underwater noise or contaminants and their direct effects on mammals and reptiles (where relevant).
Weaknesses	Most Member States do not address other direct pressures on mammals, such as collisions with ships or underwater noise.
	Measures addressing ingestion and entanglement from marine litter are not extensively reported. This can be considered as a shortcoming in the reporting by Member States, as marine litter measures reported by all Member States are likely to address this issue.
	Most measures heavily rely on the Habitats Directive. Very little information is provided on the suitability and status of these existing, often species-specific measures. There is little reference to any additional work on species not covered within the Habitats Directive (although the majority of marine mammals and reptiles are considered under this Directive), as well as the areas not covered by the Natura 2000 network (e.g., open sea areas) where all kinds of cumulative impacts can still affect species.
Recommendations	Member States should consider establishing additional measures to address relevant pressures on mammals and reptiles beyond by-catch (e.g. collisions with ships, noise, entanglement, and ingestion of litter), if not already done so.
	Member States should establish measures beyond the remits of the Habitats Directive to strengthen marine mammal and reptile protection.

v. D1, 4 Water column habitats

Have the pressures been covered by Member States?

Coherence of the programmes in the coverage of pressures and associated activities for water column habitats (D1, 4) is assessed to be *moderate* across the EU.

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 to reducing the pressure). Marine litter will be addressed indirectly.
	EE		
	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		
	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 reduce 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 to reducing the pressure).
	DK		
	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		
	DE	Partially addressed	Spatial protection measures will reduce pressures on water column habitats (incl. improving seabed habitat conditions and reduce waste water runoff). No links are made between water column habitats and measures addressing non-indigenous species

Region	Member State	Assessment against pressures	Explanation
			(even though these measures are reported under D2 and will contribute to 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 to 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 to 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 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 to 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 to 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 to 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

Region	Member State	Assessment against pressures	Explanation
			D2, D3, D5 and D8 and will contribute to 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 to 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.
	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 to 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 to 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 to reducing the pressure).
	HR		
	SI		
	EL		
	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

Region	Member State	Assessment against pressures	Explanation
			or contaminants (even though these measures are reported under D2, D5 and D8 and will contribute to reducing the pressure).
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 to reducing the pressure).
	RO		

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

Conclusions

D1, 4 — Water column habitats	
Strengths	Member States address pressures on water column habitats via measures reported for other descriptors (namely D2, D5, D7, D8 and D10). Few Member State clearly report the group of measures that are directly relevant to water column habitats and how these will contribute to achieving GES and targets for this habitat type.
Weaknesses	<p>Member States do not explicitly report which measures in their programmes will contribute to addressing pressures on water column habitats. It is thus not always clear how measures will contribute to progress towards targets and GES (as defined by each Member State).</p> <p>The water column, although considered in other descriptors, is mainly covered by Member States 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of Member States waters, within MPAs and for foodwebs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.</p>
Recommendations	Member States should more clearly indicate which measures address pressures for these habitats, and describe how GES and targets for water column habitats are expected to be achieved.

vi. D1, 4, 6 Seabed habitats

Have the pressures been covered by Member States?

Coherence of the programmes in the coverage of pressures and associated activities for seabed habitats (D1, 4, 6) is assessed to be *moderate* across the EU, as pressures other than physical pressures are not addressed in a consistent manner.

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		
	LV	Partially addressed	Physical damage from fisheries is addressed. Physical loss caused by dumping of dredge material is partially covered.
	LT		
	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, solid waste disposal, are not directly addressed (although reported under Article 8).
	DK		
	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		
	DE	Partially addressed	Physical loss and damage from fisheries is addressed. Also, habitat loss is covered. But,

Region	Member State	Assessment against pressures	Explanation
			marine hydrocarbon extraction, marine-based renewable energy generation, 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 and gravel extraction and land claim and coastal defence are not covered by the programme. Pollution is covered for 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 on 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 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

Region	Member State	Assessment against pressures	Explanation
			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, 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 about how these measures would affect seabed habitats is not clearly made.
	HR		

Region	Member State	Assessment against pressures	Explanation
	SI		
	EL		
	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 addressed	Physical damage and loss from fisheries and dredging are addressed. Physical loss and damage caused by port operations, land claim and coastal defence are partially covered.
	RO		

Table 12 Assessment conclusions of coverage of pressures by Member States for seabed habitats (D1, 4, 6)

Conclusions

D1, 4, 6 — Seabed habitats: strengths, weaknesses and recommendations	
Strengths	Several Member States report measures to regulate and reduce pressures resulting from recreational activities, particularly in MPAs, which can be destructive to seabed habitats (i.e. vessel mooring, recreational fisheries and diving).
	Few Member States report existing and new measures that target destructive fishing practices within and outside spatially protected areas, such as via the use of less destructive gears by fishing vessels.
Weaknesses	Seabed habitats (D1, 4, 6) is normally well represented within the programmes, but in varying levels of progress towards the 2020 target, with some indicating that GES will not be achieved by 2020.
	Most Member States consider trawling restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas.
	Other pressures on seabed habitats are also mostly addressed through spatial protection measures, which will limit the extent of geographical area of where restrictions of certain practices are applied and the extent to which seabed habitats are protected.
	In several cases, the Member States do not address all the pressures reported under Article 8 or only cover these partly or through indirect measures.
	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.
	Some important pressures, particularly on coastal development and mineral/aggregate extraction from the seabed, are not considered in enough detail across most Member States under D1, 4, 6, with most measures focus on trawling limitation.

D1, 4, 6 — Seabed habitats: strengths, weaknesses and recommendations

Recommendations	Member States should establish measures that address pressures reported under Article 8 relevant to seabed habitats more extensively. In addition, measures should extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats, when not done so.
	Member States should address coastal development and aggregate extraction better within programmes as both are frequently highlighted as major threats to seabed habitats.
	Member States should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.

B. Member State conclusions and recommendations

1. Belgium

General conclusions on Belgium's programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for commercial fish and shellfish (D3), contaminants (D8) and seabed habitats (D1, 4, 6). - The Member State considers that GES will be achieved by 2020 for all descriptors, except for hydrographical changes (D7) and water column habitats (D1, 4). - The programme includes measures that are based on commitments to existing European policies, such as Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the Water Framework Directive (WFD; D5, D8), Urban Wastewater Treatment Directive (UWWTD; D5, D8), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D8) or the IMO-Ballast Water Management Convention (D2) and regional actions such as the OSPAR action plan for marine litter (D10) or OSPAR Joint Assessment and Monitoring Programme (JAMP) (D5, D8). - The programme includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures. These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures include the strengthening of MPA networks and the establishment of management measures within MPAs. - 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 efforts. - 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 likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2016-2020 (except for one measure to be implemented in 2021). - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. 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.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures partially addresses GES and targets for non-indigenous species (D2), eutrophication (D5), contaminants in seafood (D9), marine litter (D10), underwater noise and energy (D11), birds, fish, and

	<p>mammals (D1, 4).</p> <ul style="list-style-type: none"> - The programme does not include any specific measure for water column habitats (D1, 4) and hydrographical changes (D7), except a WFD measure that may address D7 in the coast, which partially addresses GES and targets definitions. - In some cases, the programme does not include sufficient links to existing European policies as well as international instruments. It is especially the case for D1, 4, 6, D9 and D11. - The Member State does not always provide sufficient details about the measures to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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 representation of species and habitats within the MPAs, the size, number, and location of MPAs, the conservation objectives of the MPAs. - 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 scope of the measures is not specified consistently across the programme. - 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), especially in the case of the existing measures. This prevents understanding how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - The programme sometimes includes data collection efforts, as measures.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses introductions of non-indigenous species through shipping via ballast water management (measures linked to the implementation of the BWMC) and anti-fouling measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address introductions of non-indigenous species from aquaculture. It is also unclear whether the measures also address recreational vessels. - The programme does not include early warning systems for introductions of non-indigenous species as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial and recreational fishing. - The programme includes seasonal and/or spatial fishing bans (for several purposes, including; stock management, biodiversity conservation, and protection of over-exploited stocks) in addition to many existing CFP measures. - The measures cover stocks managed at the national level as well as aspects that relate to age/size structure of species.
Weaknesses	<ul style="list-style-type: none"> - The programme does not cover aquaculture (an activity specified as relevant

	by Belgium).
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme addresses nutrient inputs from urban areas. - The measures for eutrophication draw from Member State’s WFD River Basin Management Plans. 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 does not address nutrient inputs from agriculture. - It also does not address atmospheric deposition of nutrients (NOx) from sea-based and land-based sources (for example, no link to IMO-MARPOL).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include measures to tackle hydrographical changes. It is possible that pressures on hydrographical changes are addressed via measures reported for non-indigenous species (D2), eutrophication (D5) and contaminants (D8); but how the programme will contribute to addressing pressures on hydrographical changes (D7) specifically cannot be determined based on the information reported.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants and accidental pollution through measures that target shipping and marine-based renewable energy generation. - The programme addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas) and sea-based sources (e.g. shipping, fisheries), as well as the biological effect of contaminants.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme addresses atmospheric deposition of contaminants. - The programme includes dedicated contaminants in seafood (D9) measures, but they do not address pressures directly. - It also does not 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 addresses marine litter, by covering fisheries, shipping, and tourism/recreational activities. - It 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 specifically covers macro-litter with measures targeting litter removal. - The programme includes indirect measures to raise awareness and monitor micro-litter, which, while not yet fully addressing the problem, will positively contribute to better characterising the pressure and its potential impact on fauna.
Weaknesses	<ul style="list-style-type: none"> - The programme does not yet fully address micro-litter, referring to knowledge gaps which the indirect measures will address.

	<ul style="list-style-type: none"> - Although the Member State makes references to ‘degradation products’ in its GES and target definitions (in a general way), no direct measures are in place to tackle this aspect. - Due to the lack of knowledge and reporting on the effects of marine litter on biota, it is unclear how the Member State will interpret the issue of ‘not cause harm to the coastal and marine environment’, although this aspect has been included in its GES definition.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses impulsive noise through measures that cover marine renewable energy production. - It includes research initiatives to model/measure continuous noise. - The programme links to international organisations (Agreement on the conservation of Small Cetaceans of the Baltic and North Seas — ASCOBANS).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address continuous noise, as shipping is not covered (only covered indirectly through awareness raising efforts). It also does not address other energy inputs (such as heat or light). - It does not refer to recommendations of TG Noise. - The programme does not refer to EIA Directive and IMO Guidelines on underwater noise.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), contamination from oil and chemical spills as well as noise and light pollution. Fisheries, shipping, and recreational activities are covered.
Weaknesses	<ul style="list-style-type: none"> - There are inconsistencies between GES and targets definitions and the programme of measures; the GES and target definitions seem to include more birds’ species than what is discussed within the programme. - It does not explain how the effects of non-indigenous species and marine litter on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), contamination from oil and chemical spills as well as abrasion (physical damage), caused by fisheries and shipping.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme includes spatial protection measures that complement commercial fish and shellfish (D3) and protect both non-commercial species as well as functional fish habitats. - Most targets and GES definitions consider non-commercial fish species in their text, but only limited actions are provided in the measures (beyond those for commercial stocks). - The programme provides little information on where and how fish species present within the Member State’s territorial waters are protected.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) from fisheries.

Weaknesses	<ul style="list-style-type: none"> - The programme does not address contaminants and impacts on mammals due to shipping (collisions). - It does not explain how the pressures of marine litter and underwater noise on mammals are addressed. It is possible that these pressures are addressed by the groups of measures reported for 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	None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include dedicated measures addressing water column habitats. It may be that pressures on water column habitats are addressed via measures reported for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10); but how the programme will contribute to addressing pressures on water column habitats (D1, 4) specifically cannot be assessed based on the information reported.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical damage from fisheries, dredging/dumping of dredge material and submarine cable and pipeline operations. - It addresses physical loss and damage from marine-based renewable energy generation and marine mining. - The programme includes existing and new measures that target destructive fishing practices (such as trawling restrictions).
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses physical loss, as land claim and coastal defence operations are not covered. - It does not cover recreational activities other than recreational fishing that could still be destructive to seabed habitats (e.g., vessels mooring). - The programme mainly includes trawling restrictions mostly within spatially protected areas. These measures are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - The programme addresses other pressures on seabed habitats through spatial protection measures mostly, which will limit the extent of geographical area of where restrictions of certain practices are applied and the extent to which seabed habitats are protected. - Most measures relate to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species (D2), eutrophication (D5) and marine litter (D10). It is possible that pressures on seabed habitats are addressed by the groups of measures reported for non-indigenous species (D2), eutrophication (D5) 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.

Recommendations for Belgium to consider in its programme of measures:

General
<ul style="list-style-type: none">- In general, the Belgium should better address certain pressures and activities. These are specified in the descriptor specific recommendations below.- GES and targets definitions should be better addressed for non-indigenous species (D2), eutrophication (D5), hydrographical changes (D7), contaminants in seafood (D9), marine litter (D10), underwater noise and energy (D11), birds, fish and mammals and water column habitats (D1, 4).- The Member State should establish more links with existing EU policies and international instruments for the biodiversity descriptors, contaminant in seafood (D9) and underwater noise and energy (D11).- The Member State should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs).- The Member State should quantify the pressures present in its waters and their expected level of 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 define the spatial scope of its measures (both existing and new) 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 all marine waters.- Belgium should make better links between the groups of 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 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, 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 cover aquaculture (reported under Article 8 as a relevant source of pressure).- It should establish early warning systems for introductions of non-indigenous species as measures.
D3 — Commercial fish and shellfish
<ul style="list-style-type: none">- The Member State should cover aquaculture (reported under Article 8 as a relevant source of pressure).
D5 — Eutrophication
<ul style="list-style-type: none">- Belgium should cover agriculture (reported under Article 8 as relevant sources of pressure).- The Member State should establish measures that consider nutrient inputs from atmospheric deposition and that could be linked to IMO-MARPOL in relation to shipping (NOx

emissions).
D7 — Hydrographical changes
<ul style="list-style-type: none"> - The Member State should establish measures to tackle hydrographical changes; or clearly report which of the other descriptor measures will contribute to addressing pressure, GES and targets for hydrographical changes (D7) and how. - It should utilise synergies with MSP for addressing cumulative impacts for D7. - 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. - 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.
D8/D9 — Contaminants and contaminants in seafood
<ul style="list-style-type: none"> - The Member State should address atmospheric deposition (from sea-based and land-based sources) better. - The Member State should establish more direct measures for contaminants in seafood (D9). - The Member State should better explain the way the contaminants (D8) measures contribute to contaminants in seafood D9 targets.
D10 — Marine litter
<ul style="list-style-type: none"> - Belgium should address micro-litter better, preferably through direct measures. - The Member State should establish measures that clearly address marine litter degradation products and ensure that litter does not cause harm to the coastal and marine environment, as suggested in its GES and targets definitions. - The Member State should establish additional research efforts to address data gaps, increase knowledge and pave the way for direct action to address micro-litter as soon as possible. - The Member State should make 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 establish direct measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. shipping for continuous noise). - The Member State should establish measures that address additional aspects of this descriptor, such as heat and light. - The Member State should address data gaps and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable to then define more concrete and direct measures to address underwater noise in the second MSFD implementation cycle.
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should consider in its programme the same bird species that those mentioned in the GES and targets definitions. - The Member State should establish additional measures to address pressures on birds beyond by-catch. Measures could target 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
<ul style="list-style-type: none"> - The Member State should establish measures that extend beyond CFP efforts, and cover additional fish species, which are non-commercial species in open sea areas, as well as functional fish habitats (including spatial protection measures).

<ul style="list-style-type: none"> - The Member State should establish measures to protect non-commercial fish species from various pressures (non-indigenous species, by-catch, noise and contaminants), 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 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 the Member State's territorial waters, and how they are protected.
<p>D1, 4 — Mammals</p>
<ul style="list-style-type: none"> - The Member State should establish additional measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammal habitats due to shipping (collision), underwater noise, contaminants, 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.
<p>D1, 4 — Water column habitats</p>
<ul style="list-style-type: none"> - The Member State should establish measures to tackle the pressure associated with water column habitats. 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.
<p>D1, 4, 6 — Seabed habitats</p>
<ul style="list-style-type: none"> - The Member State should establish measures covering land claim and coastal defence as well as all aspects of recreational activities (e.g., fishing, vessels mooring, diving). - The Member State should establish measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats. - 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. - The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.

2. Bulgaria

General conclusions on Bulgaria's programme of measures

Strengths and weaknesses	
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), contaminants in seafood (D9). - The programme includes measures that are based on commitments to existing European policies, such as the Birds and Habitats Directives (D1, 4, 6), Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the Nitrate Directive (D5), the Water Framework Directive (WFD; D5, D7, D8, D1, 4, 6), Urban Wastewater Treatment Directive (UWWTD; D5, D8), the National Emission Ceiling Directive (D5, D8), the Strategic Environmental Assessment (SEA; D7), the Maritime Spatial Planning Directive (D7), Regulation (EC) No 782/2003 on the prohibition of organotin compounds of ships (D8), the Port Reception Facilities Directive (D8, D10), Regulation (EC) No 1881/2006 on setting maximum levels for certain contaminants in foodstuffs (D9), the Waste Framework Directive (D8, D10), the Environmental Impact Assessment (EIA) Directive (D7, D11), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D8) or IMO - Ballast Water Management Convention (D2) and regional actions such as the Black Sea action plan for marine litter (D10) or the Black Sea Strategic Action Plan (D8). - The programme includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - It includes spatial protection measures (including MPAs). These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures include the strengthening of MPA networks and the establishment of management measures within MPAs. - 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 spatial scope of all measures is specified consistently across the programme. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D2, D3, 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.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for eutrophication (D5), hydrographical changes (D7), contaminants (D8), marine litter (D10), birds,

	<p>fish, mammals and water column habitats (D1, 4) as well as seabed habitats (D1, 4, 6).</p> <ul style="list-style-type: none"> - Bulgaria has not provided GES and targets definitions for underwater noise and energy (D11). - For all descriptors, the Member State reports that 2020 is an ambitious timeline but does not specify whether or not this is expected to happen. The Member State reports that it cannot estimate if GES will be achieved by 2020 because of knowledge gaps and adds that no quantitative impact assessment can be made at this stage to estimate when GES will be achieved. - In some cases, the programme does not include sufficient links to existing European policies and international instruments. It is especially the case for eutrophication (D5), hydrographical changes (D7), contaminants (D8) and underwater noise D11. - Based on the information reported by Bulgaria on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the programme is likely to be implemented. However, the lack of information provided on the costs and resource allocation, as well as the uncertainty in the timelines of implementation of measures, creates doubts about the timely implementation of the programme and thus its contribution to achieving progress towards GES. - The Member State does not always provide sufficient details about the measures (especially the existing ones) to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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 representation of species and habitats within the MPAs, the size and location of MPAs, the conservation objectives of the MPAs. - 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 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 how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - The programme sometimes includes data collection efforts as measures.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species through aquaculture and shipping via ballast water management (measures linked to the implementation of the BWMC) and anti-fouling measures. - The programme includes early detection systems for introductions of non-indigenous species as measures.
Weaknesses	<ul style="list-style-type: none"> - It is unclear whether the measures also address recreational vessels.
D3 — Commercial fish and shellfish	

Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial and recreational fishing. - It includes seasonal and spatial fishing bans (for several purposes, including stock management and biodiversity conservation, protection of over-exploited stocks) that are in addition to many existing CFP measures. - The measures cover stocks managed at the national level as well as aspects that relate to age/size structure of species. - The programme has been linked to a Regional Fisheries Management Organisation: General Fisheries Commission for the Mediterranean (GFCM). - The programme includes awareness raising measures that complement direct measures.
Weaknesses	None (except the lack of timeline for the achievement of GES mentioned above).
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme addresses nutrient inputs from urban areas. - It addresses atmospheric deposition of nutrients from sea-based and land-based sources. - The programme also considers additional aspects, such as improved aquaculture management practices. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, waste water and flood risks). However, considering the extent to which the MSFD programme relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment.
Weaknesses	- The programme does not fully address nutrient inputs from agriculture and industry (one measure concerns diffuse sources, which include agriculture and industry without further information).
D7 — Hydrographical changes	
Strengths	- The programme addresses hydrographical changes. The Member State refers to existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes.
Weaknesses	- It is not clear if the programme addresses 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 the introduction of contaminants through measures that target industrial, agricultural and urban activities. - It addresses accidental pollution by tackling port operation and shipping. - It addresses contaminant inputs to the sea from land-based (e.g. industry, agriculture, urban areas) and sea-based sources (e.g. shipping, aquaculture), as well as the biological effect of contaminants.

	<ul style="list-style-type: none"> - The programme addresses atmospheric deposition of contaminants (link to the National Emission Ceiling Directive). - It includes dedicated measures for contaminants in seafood (D9).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address accidental pollution from industrial activities. - It does not 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 addresses marine litter by covering fisheries, urban areas and shipping. - It addresses both the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter (good understanding of the main sources contributing to this problem). - The programme specifically covers macro-litter with measures targeting litter removal.
Weaknesses	<ul style="list-style-type: none"> - Even though the Member State recognises the pressure of micro-litter as a relevant and very important issue for its marine waters, the programme does not yet fully address micro-litter.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses continuous noise through measures that cover marine hydrocarbon extraction. - It includes research efforts, which aim to collect additional data and conduct studies to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with recommendation from TG Noise. - The programme includes measures that aim to implement a register for impulsive and continuous sounds. - It links to international organisations (Convention on environmental impact assessment in transboundary aspect (Espoo Convention)).
Weaknesses	<ul style="list-style-type: none"> - The programme does not directly address all sources of continuous and impulsive noise, such as dredging, land claim and coastal defence, port operations, tourism and shipping (addressed indirectly through research efforts). - It does not address other energy inputs (such as heat or light). - The programme moreover does not refer to IMO Guidelines on underwater noise.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), contaminants and marine litter. Various activities such as fisheries or tourism are covered. - It covers bird habitats and their resting and feeding sites.
Weaknesses	<ul style="list-style-type: none"> - Measures does not address the effect of non-indigenous species on seabirds. It may be that these are somewhat addressed by non-indigenous species (D2) measures, but how the they will contribute to addressing these pressures on birds (D1, 4) specifically cannot be assessed based on the information reported.
D1, 4 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental

	<p>by-catch), contaminants, marine litter as well as underwater noise from several activities such as fisheries.</p> <ul style="list-style-type: none"> - It complements commercial fish and shellfish (D3) measures with spatial protection measures aiming to also protect non-commercial species and functional fish habitats. - Most targets and GES definitions consider non-commercial fish species, and the programme covers both commercial and non-commercial fish species.
Weaknesses	<ul style="list-style-type: none"> - The programme provides little information on where and how fish species present within the Member State's territorial waters are protected.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), contaminants, marine litter and underwater noise from various activities such as fisheries. - Measures address the impact on mammal habitats due to fishing, dredging and offshore structures. - It includes spatial protection measures to address several pressures such as by-catch and habitat damage/loss.
Weaknesses	<ul style="list-style-type: none"> - The programme does not directly address impacts on mammals due to shipping (collisions).
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - None identified.
Weaknesses	<ul style="list-style-type: none"> - Even though the programme includes measures that are relevant to water column habitats, they are either indirect (monitoring and research efforts) or cover an activity that has marginal impacts on water column habitats (fisheries). - The water column, although considered in other descriptors, is mainly covered by the Member State in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is referred to in the water column habitats GES and targets definitions but not in the programme. Additionally, the water column is a key transfer route for the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses physical damage from fisheries. - It includes measures that target destructive fishing practices (trawling) within and outside spatially protected areas. - The programme addresses other pressures such as contaminants and marine litter.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address physical loss and damage from land claim, coastal defence and port operations. - It does not cover recreational activities other than recreational fishing that could also be destructive to seabed habitats (e.g. vessels mooring). - The programme does not make links to other descriptors such as non-indigenous species (D2) and eutrophication (D5).

Recommendations for Bulgaria to consider in its programme of measures:

General
<ul style="list-style-type: none">- In general, the Bulgaria should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below.- GES and targets definitions should be better addressed for eutrophication (D5), hydrological changes (D7), contaminants (D8), marine litter (D10), birds, fish, mammals and water column habitats (D1, 4) and seabed habitats (D1, 4, 6).- The Member State should provide GES and targets definitions for underwater noise (D11).- It should provide an assessment on when GES will be achieved.- The Member State should establish more links with existing EU policies and international instruments for contaminant in seafood (D9), eutrophication (D5), hydrographical changes (D7) and underwater noise and energy (D11).- The Member State should clearly identify the timelines for implementation of all measures as well as secured funding.- Bulgaria's programme should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size and location of MPAs, the conservation objectives of the MPAs).- The Member State should quantify the pressures present in its waters and their expected level of 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.- Bulgaria should make better links between the groups of 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 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, when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research measures.- Bulgaria should provide more information on estimating the reductions of pressures that are expected from the measures and how this will benefit species and habitats. Many of the monitoring programmes included detailed ecological information on the dynamics of species and habitats and deviations from natural trends and it is important that this information is put in context with the programme and when such measures will allow for GES to be achieved for species and habitats.
D2 — Non-indigenous species
<ul style="list-style-type: none">- The Member State should clearly state whether recreational vessels are covered by the measures.
D5 — Eutrophication
<ul style="list-style-type: none">- The Member State should cover agriculture and industry better.
D7 — Hydrographical changes
<ul style="list-style-type: none">- The programme should address cumulative impacts.

<ul style="list-style-type: none"> - Bulgaria's programme should utilise synergies with MSP for addressing cumulative impacts for D7. - 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.
<p>D8/D9 — Contaminants and contaminants in seafood</p>
<ul style="list-style-type: none"> - The Member State should establish measures on accidental pollution due to industrial activities. - The Member State should better explain the manner in which the contaminants (D8) measures contribute to contaminants in seafood D9 targets.
<p>D10 — Marine litter</p>
<ul style="list-style-type: none"> - The Member State should address micro-litter better, through direct measures, in addition to indirect measures, in accordance with recommendations of TG Litter. - The Member State should make efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
<p>D11 — Underwater noise and energy</p>
<ul style="list-style-type: none"> - Bulgaria should establish direct measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. dredging, shipping). - The Member State should establish measures that address additional aspects of this descriptor, such as heat and light. - It should also make more efforts to address data gaps and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable to then define more concrete and direct measures to address underwater noise in the second MSFD implementation cycle.
<p>D1, 4 — Birds</p>
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to address pressures on birds beyond by-catch. Measures could target the 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.
<p>D1, 4 — Fish</p>
<ul style="list-style-type: none"> - Bulgaria 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 the Member State's territorial waters, and how they are protected.
<p>D1, 4 — Mammals</p>
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammal habitats due to shipping (collision)). 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.
<p>D1, 4 — Water column habitats</p>
<ul style="list-style-type: none"> - The Member State should establish measures that have a more direct impact on water column habitats (and also on plankton) and cover relevant activities. - The Member State should more clearly indicate which measures reported under other descriptors address pressures for water column habitats, and elaborate on how GES and targets for water column habitats are expected to be achieved.
<p>D1, 4, 6 — Seabed habitats</p>
<ul style="list-style-type: none"> - The Member State should establish measures covering land claim and coastal defence, port operations as well as all aspects of recreational activities (e.g., fishing, vessels mooring,

diving).

- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2), the Member State should explain the expected effect that measures have on seabed habitats.
- Bulgaria should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.

3. Cyprus

General conclusions on Cyprus' programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for non-indigenous species (D2) (only GES since no targets have been defined for D2), eutrophication (D5), hydrographical changes (D7) (only GES since no targets have been defined for D7), contaminants (D8) and contaminants in seafood (D9). - The Member State considers that GES has already been achieved for eutrophication (D5), contaminants (D8) 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; D3), the Water Framework Directive (D5, D8), IMO-MARPOL and MEDPOL16 related activities (not specified) (D5, D8), the Offshore Protocol of the Barcelona Convention (D8, D9, D11), the Directives 2014/52/EU (EIA) and 2001/42/EC (SEA) (D8, D11), the Regulations 708/2007 (on the use of alien species in aquaculture) (D2), 1380/2013 (on the Common Fisheries Policy) and 1343/2011 (on provisions for fisheries), Council Regulation No 1967/2006 (sustainable exploitation of fishery resources in the Mediterranean Sea) and the ICCAT (D3), the Nitrates Directive (D5), the REACH Regulation, the Directives 89/39/EEC (on occupational Safety and Health Framework) and 2013/39/EU (on priority substances in water policy) (D8), Regulation (EC) 1881/2006 (levels of contaminants in foodstuffs) (D9), the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources (Barcelona Convention), the Strategic Action Programme (SAP-MED) to combat land-based sources in the Mediterranean, the Waste Framework Directive and the Mediterranean beach cleaning day (supported by UNEP/ MAP) (D10). - 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. - It includes spatial protection measures (including one existing MPA and other new ones which are already planned). These measures address more than one descriptor at a time (D1, 4, 6 and D3) and therefore contribute towards GES and targets for several descriptors. Measures include studies for the potential establishment of new MPAs and Fisheries' Protected Areas and the development of management plans for the existing MPAs. - 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 efforts.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for birds, fish and cephalopods, marine mammals and reptiles, water column habitats (D1, 4) and seabed habitats (D1, 4, 6), commercial fish and shellfish (D3) and marine

¹⁶ The MEDPOL programme for the Assessment and Control of Marine Pollution in the Mediterranean.

	<p>litter (D10).</p> <ul style="list-style-type: none"> - It does not address GES and targets for underwater noise and energy (D11). - Cyprus does not provide a timeline for achieving GES for biodiversity (D1, 4, 6), commercial fish and shellfish (D3), hydrographical changes (D7), marine litter (D10) and underwater noise and energy (D11). - Cyprus considers that GES will not be achieved by 2020 for non-indigenous species (D2). - In some cases, the programme does not include sufficient links to existing European policies as well as regional instruments. It is especially the case for D3 and birds, fish and cephalopods (D1, 4). - The spatial scope is not detailed for most of the measures. - The programme of measures does not report a timeline for the implementation of all its new measures (which specifically concerns non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), marine litter (D10) and biodiversity (D1, 4 and D1, 4, 6)).
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species from aquaculture. - It aims to reduce the existing population of <i>Lagocephalus</i> ssp (non-indigenous species) by its targeted fishing and removal. How effective this may be remains unclear.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the introduction of non-indigenous species from shipping and, although a justification for this is provided related to Suez Canal, no additional efforts to address this issue are reported. - The programme does not address the introduction of non-indigenous species due to land claim and coastal defence activities (identified by Cyprus as relevant in its Article 8 report).
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial and recreational fishing (this one only covered by one indirect measure). - It also includes seasonal and spatial fishing bans, as well as the management or prohibition of fishing by mobile demersal gears that affect the seabed.
Weaknesses	<ul style="list-style-type: none"> - The programme is not clearly linked with the CFP, it is therefore not clear whether all commercially-exploited species are covered.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme addresses nutrient inputs from sources such as urban, aquaculture, agriculture and forestry, shipping, and industry. - The measures for eutrophication draw from Member State's WFD River Basin Management Plans. 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 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 (NO_x) from sea-based and land-based sources.
Weaknesses	None identified.

D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses hydrographical changes from port activities, industry, coastal defence and desalination/water abstraction. - It also 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 SEA Directives, as well as with the WFD.
Weaknesses	<ul style="list-style-type: none"> - The programme does not clearly address hydrographical changes from urban and agriculture/forestry related activities (identified by Cyprus as relevant in its Article 8 report). Although these activities might be partially covered by the horizontal measure that relates to the implementation of the SEA and EIA Directives. - It 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 Cyprus.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas), as well as sea-based sources (e.g. shipping, aquaculture and marine hydrocarbon extraction). - It addresses accidental pollution and atmospheric deposition.
Weaknesses	None identified.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter from urban areas, tourism and recreation, commercial and recreational fishing.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address marine litter from shipping or industrial sources. - It does not address micro-litter (no direct or indirect measures). - The programme does not directly address the Cypriot target on reducing the mortality of turtles.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses underwater noise from marine hydrocarbon extraction activities.
Weaknesses	<ul style="list-style-type: none"> - It does not address shipping, fisheries, recreational activities, industry (oil and gas), marine research (surveys and educational activities) nor defence operation activities. - The lack of GES definition and targets hinders the general assessment of the programme for this MSFD descriptor.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses the health of bird populations via spatial protection measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not specify the bird species that are addressed. - Few measures link directly to birds or address impacts on them and their habitats. - It 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, noise, contaminants, and litter ingestion, but rather mentions vaguely ‘various pressures on bird habitats’.
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by commercial fishing. - It also includes measures on fishing bans in sensitive areas and MPAs designation and management.
Weaknesses	<ul style="list-style-type: none"> - The programme addresses the pressures with localised measures like artificial reefs and MPAs, it is therefore not clear how the diversity and abundance of species will be maintained in Cypriot waters, as a whole, from these measures. - It does not include specific measures or plans for cephalopods.
D1, 4 — Mammals and reptiles	
Strengths	<ul style="list-style-type: none"> - The programme addresses underwater noise (including a reference to the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area — ACCOBAMS) and ‘various pressures’ on mammal and reptile habitats (not specified).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address marine mammals and reptiles by-catch from fishing activities. - It does not address other pressures on mammals different than noise, such as collisions with ships.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The Member State addresses pressures on water column habitats via measures reported for other Descriptors (e.g., D5 and D8).
Weaknesses	<ul style="list-style-type: none"> - Cyprus does not clearly report all the group of measures that are directly relevant to water column habitats and how these will contribute to achieving GES and targets for this habitat type. - The programme does not directly address 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 addresses physical damage of the seafloor from fisheries, dredging and dumping of dredged material.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address physical damage from port operations, land claim and coastal defence (reported as relevant by the Member State under Article 8), as well as aquaculture, industry, agriculture, urban areas, and recreational activities; which are addressed by neighbouring countries. - Cyprus addresses various anthropogenic impacts on seabed habitats through spatial protection measures, which are often lacking detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - 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.

Exceptions

Cyprus 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'). Cyprus explains that the pressure of introductions of non-indigenous species to Cyprus' marine waters is beyond its control given the transboundary aspects of these introductions in the region, mainly coming from the Suez Canal.

The assessment finds the justification provided by Cyprus to be grounded.

Recommendations for Cyprus to consider in its programme of measures:

General

- In general, the Cyprus 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. More specifically, in a few cases (e.g. marine litter (D10) and, to a lesser extent, non-indigenous species (D2)) measures address past, ongoing, and future inputs (e.g. removal of marine litter from the marine environment, in addition to preventing ongoing and future inputs of marine litter). In other cases (e.g. contaminants (D8)), the Member State considers that it is not feasible or cost-effective to remove contaminants which have been introduced in the past and are still present in the marine environment, but rather focus on controlling ongoing and future inputs. In these cases, contaminants will continue to act as sources of the pressure on the marine environment for years to come, depending on their degradation rates.
- GES and targets definitions should be better addressed for birds, fish and cephalopods, marine mammals and reptiles, water column habitats (D1, 4) and seabed habitats (D1, 4, 6), commercial fish and shellfish (D3), marine litter (D10) and underwater noise (D11).
- The Member State should strive to determine the timelines for achieving GES (especially for D3, D7, D10, D11, D1, 4, 6). Furthermore, if GES is not expected to be achieved by 2020, then the Member State should estimate the alternative dates by when GES will be achieved.
- Cyprus should establish links with existing EU policies and international agreements (e.g. for D3 and D11). This would improve the overall coherence and coverage of the programme.
- 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.
- It should clearly identify the timelines for implementation of their new measures (i.e. for D2, D3, D5, D7, D10, D1, 4, 6), secured funding, and the entities in charge of implementation for all their measures.
- 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

<p>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.</p> <ul style="list-style-type: none"> - The Member State should ensure coherence of its determinations of GES, environmental targets and the programme. This would allow use environmental targets systematically as milestones towards achieving GES through the measures, and monitor this progress through the MSFD monitoring programmes. This is applicable mainly to birds, marine mammal and reptiles (D1, 4), non-indigenous species (D2), hydrographical changes (D7) and underwater noise and energy (D11). - Cyprus 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.
<p>D2 — Non-indigenous species</p> <ul style="list-style-type: none"> - The Member State should address the introduction of non-indigenous species in its marine waters from shipping, land claim and coastal defence activities.
<p>D3 — Commercial fish and shellfish</p> <ul style="list-style-type: none"> - The Member State should clarify the link of its programme of measures with the CFP.
<p>D7 — Hydrographical changes</p> <ul style="list-style-type: none"> - Cyprus should establish measures to tackle hydrographical changes from additional human activities such as urban areas and agriculture. - It should address cumulative impacts on habitats by multiple stressors. - The Member State should utilise synergies with MSP for addressing cumulative impacts. - Its 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.
<p>D10 — Marine litter</p> <ul style="list-style-type: none"> - The Member State should establish measures to address marine litter from shipping or industrial sources. - Its programme State should address micro-litter, preferably through direct measures. - Cyprus should conduct additional research to address data gaps, increase knowledge and pave the way for direct action as soon as possible. - The Member State should make efforts to identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.) and reduce the mortality of turtles.
<p>D11 — Underwater noise and energy</p> <ul style="list-style-type: none"> - The Member State should establish direct measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. shipping, fisheries, recreational activities, industry (oil and gas), marine research activities). - It should address data gaps 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. - The Member State should consider establishing measures that target other energy inputs if possible (e.g. heat, light).
<p>D1, 4 — Birds</p> <ul style="list-style-type: none"> - Cyprus 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 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

- The Member State should establish measures that extend beyond CFP efforts, and cover additional fish species and cephalopods, which are non-commercial species in open sea areas, as well as functional fish habitats (including spatial protection measures).
- It should establish measures that include additional MPAs in open sea areas to protect non-commercial fish species from various pressures (non-indigenous species, by-catch, noise and contaminants). 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 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

- Cyprus should establish additional measures covering by-catch from fishing activities.
- The Member State should establish 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 more clearly indicate which measures address pressures for these habitats (as well as plankton communities), and elaborate on how GES and targets for water column habitats are expected to be achieved.

D1, 4, 6 — Seabed habitats

- The Member State should establish measures covering port operations, land claim and coastal defence as well as all aspects of recreational activities (e.g., fishing, vessels mooring, diving), aquaculture, industry, agriculture and urban areas.
- It 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, D5, D10), the expected effect that measures are to have on seabed habitats should be explained.

4. Germany

General conclusions on Germany's programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme 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), birds, fish and mammals (D1, 4). - Germany has brought together and coordinated existing national measures and processes (related to the implementation of EU legal acts and regulations, as well as regional commitments to protect the marine environment more efficiently), and also established new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - The programme includes measures that are based on commitments to existing European policies and legislation, such as the Birds and Habitats Directives (D1, 4, 6), Regulations (EU) No 1143/2014 and 708/2007 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the WFD (D5, D7, D8, D1, 4, 6), the National Emission Ceilings Directive (D5, D8), the Nitrates Directive (D5), the EIA (D7, D11), Integrated coastal zone management (D7), MSP Directive (D7), the IED¹⁷ (D8), Regulation (EC) 782/2003 (D8) as well as international instruments such as IMO-MARPOL (D5, D8) and the Gothenburg Protocol (D5), and regional actions such as HELCOM and OSPAR action plan for litter (D10). - Germany's programme includes spatial protection measures (including MPAs). Often, these measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures especially include the strengthening of MPA networks and the establishment of management measures within MPAs. - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment, while simultaneously implementing measures complementing the direct measures through governance and coordination actions, as well as awareness raising 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 allows for better understanding how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - Based on the information reported by the Germany on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2016 (with few being 2018). - In this first implementation cycle of the MSFD, in relation to descriptors for

¹⁷ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), OJ L 334, 17.12.2010, p. 17.

	<p>which knowledge gaps exist (i.e. D11), the Member State reports research efforts. This will allow addressing knowledge gaps but also to build upon the results to design measures, which will contribute directly to tackling the pressures in the MSFD's second implementation cycle.</p> <ul style="list-style-type: none"> - The spatial scope of the measures is specified consistently across the programme of measures.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for underwater noise and energy (D11), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - The Member State reports that the current level of scientific knowledge does not allow an assessment on whether GES will be achieved by 2020. - In rare cases, it does not include sufficient links to existing European policies and legislation as well as international instruments. It is the case for contaminants in seafood (D9) and underwater noise (D11). - The programme includes spatial measures that 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 representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs and the policies and measures that will be in place within these areas. - 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.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species by tackling aquaculture and shipping via ballast water management (link to the BWMC) and anti-fouling measures.
Weaknesses	<ul style="list-style-type: none"> - It is unclear whether the measures cover recreational vessels. - The programme does not include early warning systems for introductions of non-indigenous species as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by covering fisheries (commercial fishing and recreational fishing) and aquaculture (an activity specified as relevant by Germany in its Article 8 report). - It also includes seasonal and spatial fishing bans (for several purposes including stock management and biodiversity conservation) that are in addition to existing CFP measures. - The measures cover stocks managed at the national level, non-targeted species as well as age/size structure.
Weaknesses	<ul style="list-style-type: none"> - None (except the lack of timeline for the achievement of GES mentioned above).
D5 — Eutrophication	
Strength	<ul style="list-style-type: none"> - The programme addresses nutrient enrichment by tackling agriculture, shipping and urban areas. - It also draws from the Member State's WFD River Basin Management Plans (RBMP). In the framework of the MSFD, most are considered likely to be sufficient to address pressures of nutrient and organic matter

	<p>enrichment in the marine environment and cover relevant human activities (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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 (NO_x) from sea-based (link to IMO-MARPOL) and land-based sources (link to the Gothenburg Protocol and the NEC¹⁸ Directive).
Weaknesses	<ul style="list-style-type: none"> - The programme does not consider additional aspects, such as improved aquaculture management practices.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses hydrographical changes. It includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - The programme also includes MSFD specific measures beyond existing regulatory frameworks. - The programme refers to MSP and Integrated coastal zone management processes. - It also addresses cumulative impacts, i.e. impacts from different/multiple human activities/projects 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.
Weaknesses	<ul style="list-style-type: none"> - The programme does not make a clear link to SEA procedures.
D8/D9 — Contaminants and contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants and accidental pollution through measures that target shipping, agriculture, industry and urban areas. - It addresses contaminant inputs to the sea from land-based (e.g. agriculture, industry, urban areas), as well as sea-based sources (e.g. shipping, marine mining). - The programme addresses atmospheric deposition of contaminants and biological effects of contaminants (oiled seabirds).
Weaknesses	<ul style="list-style-type: none"> - The programme 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 addresses marine litter by covering land-based (e.g. industry, tourism) and sea-based (e.g. fisheries, offshore structures, shipping) sources of litter. - It 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 covers both macro and micro-litter. - Measures include awareness raising efforts in addition to direct measures.

¹⁸ Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants, OJ L 309, 27/11/2001 p. 21.

Weaknesses	<ul style="list-style-type: none"> - The Member State does not seem to distinguish ‘decomposition/degradation products’ from micro-litter in its measures, although this differentiation is included in its GES definition. - Due to the lack of knowledge and reporting on the effects of marine litter on biota, it is unclear how the Member State will interpret and address the issue of having ‘no harmful effects on marine life and habitats’, although this aspect has been included in the GES definition.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses continuous and impulsive underwater noise by covering marine based renewable energy, marine mining, marine hydrocarbon exploitation, shipping, defence operations, marine research as well as fisheries. - It addresses other energy inputs (i.e. heat and light). - The programme includes measures that aim to implement a register for impulsive noise and develop standards for noise mapping. - The programme includes research efforts on the impact of light on birds.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the impact of electromagnetic fields on marine life (reported as part of the GES and targets definitions).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch), habitat loss, visual disturbances as well as the introduction of noise and energy. Fisheries, marine based renewable energy and offshore activities are covered. - It covers birds’ food sources through measures targeting fisheries management (that should also protect birds’ feeding grounds), especially in protected areas.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how the effects of non-indigenous species and marine litter on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch), physical loss and damage, fish habitat loss, obstacles for migration as well as the introduction of energy and noise. Various activities are covered such as fisheries and shipping. - It includes spatial protection measures to complement commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats. - The Member State reports that, in their MPAs, all species listed in the Habitats Directive and on the HELCOM and OSPAR lists of endangered species are covered.
Weaknesses	<ul style="list-style-type: none"> - None (except the lack of timeline for the achievement of GES mentioned above).
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), physical loss and damage, as well as the introduction of energy

	<p>and noise. Various activities such as fisheries and shipping are covered.</p> <ul style="list-style-type: none"> - It includes spatial protection measures to address several pressures such as underwater noise due to shipping, by-catch and protecting migratory species by ensuring a coherent network of MPAs.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how contaminants and marine litter on mammals is addressed. It is possible that these pressures are addressed by the groups of measures reported for 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 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme includes measures that are relevant to water column habitats (spatial protection measures and measures aiming at improving seabed habitat condition and reduce waste water runoff) although they are not specific to this habitat.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses pressures on water column habitats, as no specific water column habitat measure have been reported and the Member State does not clearly identify how measures reported under other descriptors (e.g. D2, D5, D8) will address relevant pressures on this habitat. - The water column, although considered in other descriptors, is mainly covered by the Member State 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical damage from fisheries, marine mining (including sand and gravel extraction) and shipping. - It addresses physical loss from offshore activities (among others). - The programme includes existing and new measures that target destructive fishing practices particularly in MPAs but also outside spatially protected areas. - It addresses other pressures such as by-catch, habitat loss and noise.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address physical loss from marine-based renewable energy generation, marine hydrocarbon extraction and solid waste disposal. - It is not clear whether the measures addresses recreational activities other than recreational fishing that could still be destructive to seabed habitats (e.g. vessels mooring). - The programme mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - Most measures relate to physical loss and damage to seabed habitat, with

	minimal consideration of other pressures such as non-indigenous species, eutrophication and marine litter.
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Recommendations for Germany to consider in its programme of measures:

General
<ul style="list-style-type: none"> - In general, the Germany should better address certain pressures and activities. These are specified in the descriptor specific recommendations below. - GES and targets definitions should be better covered for underwater noise and energy (D11), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - The Member State should develop more efforts to fill knowledge gaps and provide an assessment on when GES will be achieved. - Germany's programme should establish more links with existing EU policies and international instruments for contaminants in seafood (D9) and underwater noise (D11). - The programme should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs and the policies and measures that will be in place within these areas). - The Member State should quantify the pressures present in its waters and their expected level of 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.
D2 — non-indigenous species
<ul style="list-style-type: none"> - The Member State should clarify whether recreational vessels are covered by the measures. - The Member State should establish early warning systems for introductions of non-indigenous species as measures.
D5 — Eutrophication
<ul style="list-style-type: none"> - The Member State should consider covering additional aspects, such as nutrient inputs from aquaculture, if relevant.
D7 — Hydrographical changes
<ul style="list-style-type: none"> - Germany'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. - It 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.
D8/D9 — Contaminants and contaminants in seafood
<ul style="list-style-type: none"> - The Member State should better explain the manner in which the D8 measures contribute to D9 targets.
D10 — Marine litter
<ul style="list-style-type: none"> - Germany should establish measures that clearly address marine litter degradation products and ensure that litter does not cause harm to marine life and habitats as suggested in the GES definition. - It should establish research efforts to address data gaps, increase knowledge and pave the way for direct action to address degradation products as well as counter effects on marine

<p>species as specified in its GES and targets.</p> <ul style="list-style-type: none"> - The Member State should make efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
<p>D11 — Underwater noise and energy</p>
<ul style="list-style-type: none"> - The Member State should establish measures that address the impact of electromagnetic fields on marine life.
<p>D1, 4 — Birds</p>
<ul style="list-style-type: none"> - Germany should specify how pressures on birds beyond by-catch are addressed (or will be addressed), namely the effects of non-indigenous species and ingestion of litter.
<p>D1, 4 — Mammals</p>
<ul style="list-style-type: none"> - The Member State should specify how pressures on mammals beyond by-catch are addressed (or will be addressed), namely the contaminants and ingestion of litter.
<p>D1, 4 — Water column habitats</p>
<ul style="list-style-type: none"> - The Member State should more clearly indicate which measures reported under other descriptors address pressures for water column habitats (including plankton), and elaborate on how GES and targets for water column habitats are expected to be achieved.
<p>D1, 4, 6 — Seabed habitats</p>
<ul style="list-style-type: none"> - Germany should establish measures addressing marine-based renewable energy generation, marine hydrocarbon extraction and solid waste disposal as well as all aspects of recreational activities (e.g., fishing, vessels mooring). - It should establish more measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats. - Its programme should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - The Member State should more clearly indicate which measures reported under other descriptors address pressures for seabed habitats, and elaborate on how GES and targets for seabed habitats are expected to be achieved.

5. Spain

General conclusions on Spain's programme of measures:

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for all descriptors. - The Member State considers GES is already achieved for eutrophication (D5) and hydrographical changes (D7) in all its regions. - The programme includes measures that are based on commitments to existing European policies and legislation, such as the Birds and Habitats Directives (D1, 4, 6; D2, D5, D7, D9), WFD (D 1, 4, 6; D5, D7, D8, D10), Environmental Quality Standards Directive¹⁹ (D1, 4, 6; D5, D7, D8, D9, D10), Directive 2015/720 on reducing the consumption of lightweight plastic carrier bags (D1, 4, 6; D10), Directive 94/62/EC on packaging and packaging waste (D1, 4, 6; D10), the UWWTD (D1, 4, 6; D5, D7, D9, D10), the Common Fisheries Policy (D3), MSPD (D7, D9), Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (D1, 4, 6; D2), Regulation (EU) No 508/2014 on the European Maritime and Fisheries Fund (D1, 4, 6; D3), COM(2012) 665 final Action Plan for reducing incidental catches of seabirds in fishing gear (D1, 4, 6), Regulation (EC) No 812/2004 laying down measures concerning incidental catches of cetaceans in fisheries (D1, 4, 6), the Regulation (EU) No 1343/2011 on provisions for fisheries (D3), Regulations (EC) No 1224/2009 and (EU) No 404/2011 concerning the mandatory fitting of 'blue box' devices for vessels (D3), Regulation (EU) No 1967/2006 concerning management measures for the sustainable exploitation of fisheries resources in the Mediterranean Sea (D3), the Nitrates Directive (D5), Directive 2009/90/EC on the technical specifications for chemical analysis and monitoring of water status (D7, D10), Directive 2008/98/EC on waste (D7, D9), Directive 2009/16/EC on port State control (D7), Directive 2005/35/EC on ship-source pollution and on the introduction of penalties for infringements (D7, D9), Directive 2009/17/EC establishing a Community vessel traffic monitoring and information system (D7), Directive 2009/18/EC establishing the fundamental principles governing the investigation of accidents in the maritime transport sector (D7), Directive 2013/30/EU on safety of operations at sea in the hydrocarbons sector (D7), the REACH regulation (D8, D9), Directive 2013/30/EU Offshore Directive (D9), Directive 2000/59/CE on port reception facilities for ship-generated waste and cargo residues (D10), Directive 2002/96/EC on waste electrical and electronic equipment (D10), and the EIA and SEA Directives (D11), as well as other international agreements such as the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area — ACCOBAMS (D1, 4, 6), the GFCM (D1, 4, 6; D3), ICCAT (D3), IMO-MARPOL (D8), and regional actions such as references to the Barcelona and OSPAR conventions (all descriptors except

¹⁹ Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council.

	<p>D11).</p> <ul style="list-style-type: none"> - The Member State has brought together and coordinated existing national measures and processes (related to the implementation of EU legal acts and regulations, as well as regional commitments to protect the marine environment more efficiently), and also established new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - Its programme includes spatial protection measures (including MPAs). Often, these measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures especially include the strengthening of MPA networks and the establishment of management measures within MPAs. - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment, while simultaneously implementing measures complementing the direct measures through governance and coordination actions, as well as awareness raising 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 allows for better understanding how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - Based on the information reported by the Spain on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2016 (with very few being 2017). - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D11), the Member State reports research efforts. This will allow addressing knowledge gaps but also to build upon the results to design measures, which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - The spatial scope of the measures is specified consistently across the programme.
Weaknesses	<ul style="list-style-type: none"> - The Member State does not report whether GES will be achieved by 2020 for non-indigenous species (D2), commercial fish and shellfish (D3), contaminants (D8), contaminants in seafood (D9), marine litter (D10), underwater noise (D11), birds, fish and cephalopods, mammals and reptiles, seabed and water column habitats (D1, 4, 6). - 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.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species by tackling aquaculture and shipping via ballast water management (link to the BWMC) and anti-fouling measures. - It also addresses recreational activities. - The programme includes early warning systems of non-indigenous species

	introductions as measures.
Weaknesses	- None (except the lack of timeline for the achievement of GES mentioned above).
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by covering fisheries (commercial fishing and recreational fishing). - It includes seasonal and spatial fishing bans (for several purposes including stock management and biodiversity conservation) that are in addition to existing CFP measures. - The measures cover stocks managed at the national level, non-targeted species as well as age/size structure.
Weaknesses	- None (except the lack of timeline for the achievement of GES mentioned above).
D5 — Eutrophication	
Strength	<ul style="list-style-type: none"> - The programme addresses nutrient enrichment by tackling agriculture, shipping and urban activities, among many other activities. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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 (NOx) from sea-based and land based sources.
Weaknesses	- The programme of measures does not address nutrient enrichment from fisheries.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses hydrographical changes. It includes existing measures stemming from other legal acts. As such, projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - It also includes MSFD specific measures beyond existing regulatory frameworks. - The programme refers to MSP and Integrated coastal zone management processes.
Weaknesses	- The programme does not address cumulative impacts, i.e. impacts from different/multiple human activities/projects 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 addresses the introduction of contaminants and accidental pollution through measures that target shipping, agriculture, industry and urban activities among others. - It addresses contaminant inputs to the sea from land-based (e.g. agriculture, industry, urban areas), as well as sea-based sources (e.g. shipping, marine

	<p>mining).</p> <ul style="list-style-type: none"> - The programme addresses atmospheric deposition of contaminants and biological effects of contaminants (oiled seabirds). - The programme addresses contaminants in seafood (D9) via D8 and D9 measures and clearly 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.
Weaknesses	None (except the lack of timeline for the achievement of GES mentioned above).
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter by covering land-based (e.g. industry, tourism, port operations, urban areas) and sea-based (e.g. fisheries, offshore structures, shipping) sources of litter. - It 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 of measures covers both macro and micro-litter. - The programme includes indirect measures focused on awareness raising, training and education, which, while not yet fully addressing the problem, will positively contribute to better characterising the pressure and its potential impact on fauna.
Weaknesses	- None (except the lack of timeline for the achievement of GES mentioned above).
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses continuous and impulsive underwater noise by covering shipping (both commercial and recreational), sub-marine cables/pipelines and marine research. - It includes measures that aim to implement a register for impulsive noise and develop standards for noise mapping. - The programme includes research efforts to cover gaps.
Weaknesses	<ul style="list-style-type: none"> - The programme addresses fisheries by a measure that only has an indirect effect on the pressure (its aim is to raise awareness). - It does not address marine hydrocarbon extraction, port operations and extraction activities /solid waste disposal (identified as relevant by Spain in its Article 8 report).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses by-catch, habitat loss, as well as biological disturbances from non-indigenous, pollution (contaminants and light) and marine litter. - It covers birds' food sources through measures targeting fisheries management (that should also protect birds' feeding grounds), especially in protected areas.
Weaknesses	- None (except the lack of timeline for the achievement of GES mentioned above).
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme addresses by-catch from fisheries, fish habitat loss from various activities, pollution and marine litter. - It addresses aquaculture. - The programme includes spatial protection measures to complement

	<p>commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats.</p> <ul style="list-style-type: none"> - It includes specific plans for cephalopods.
Weaknesses	<ul style="list-style-type: none"> - None (except the lack of timeline for the achievement of GES mentioned above).
D1, 4 — Mammals and reptiles	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses accidental by-catch, pollution, collisions with ships, marine litter as well as the introduction of energy and noise (on mammals) and various other pressures on mammal habitats. Various activities such as fisheries and shipping are covered. - It includes spatial protection measures to address several pressures such as underwater noise due to shipping, by-catch and protecting migratory species by ensuring a coherent network of MPAs.
Weaknesses	<ul style="list-style-type: none"> - None (except the lack of timeline for the achievement of GES mentioned above).
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme includes measures that are relevant to water column habitats (spatial protection measures and measures aiming at improving seabed habitat condition and reduce waste water runoff) although they are not specific to this habitat.
Weaknesses	<ul style="list-style-type: none"> - The water column, although considered in other descriptors, is mainly covered by the Member State 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical damage from fisheries, port operations/dredging/solid waste disposal, land claim/coastal defence, shipping and tourism/recreational activities. - It addresses physical loss from land claim/coastal defence and offshore activities (such as mining, port operations/dredging/solid waste disposal, underwater cables, artificial reefs). - The programme includes existing and new measures that target destructive fishing practices particularly in MPAs, and sometimes outside of MPAs. - It also addresses other pressures such as pollution, marine litter and non-indigenous species (even though fewer measures have been reported for these pressures in relation to seabed habitats).
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme addresses physical damage from hydrocarbon extraction (reported as relevant in Article 8 by the Member State). - The programme of measures mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas.

Recommendations for Spain to consider in its programme of measures:

General
<ul style="list-style-type: none">- In general, Spain should better address certain pressures and activities. These are specified in the descriptor specific recommendations below.- The Member State should specify by when it expects GES to be achieved for all descriptors in all regions (except D5 and D7 because the Member State specifies in the programme that GES is already achieved for these descriptors).- Spain's programme should quantify the pressures present in its waters and their expected level of 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 develop more research efforts to fill knowledge gaps and provide an assessment on when GES will be achieved.
D5 — Eutrophication
<ul style="list-style-type: none">- The Member State should consider covering additional aspects, such as nutrient inputs from fisheries, if relevant.
D7 — Hydrographical changes
<ul style="list-style-type: none">- 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.- 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.
D10 — Marine litter
<ul style="list-style-type: none">- The programme should make 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 establish measures addressing fisheries, hydrocarbon extraction, port operations and extraction activities /solid waste disposal (identified as relevant by Spain in its Article 8 report), that have direct effects on the pressure.
D1, 4 — Water column habitats
<ul style="list-style-type: none">- Spain's programme should more clearly indicate which measures reported under other descriptors address pressures for water column habitats (and plankton communities), and elaborate on how GES and targets for water column habitats are expected to be achieved.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none">- The Member State should clearly explain how the measures address physical damage from hydrocarbon extraction (reported as relevant in Article 8 by the Member State).- It should establish more measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats.- The programme should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.

6. Finland

General conclusions on Finland's programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for birds, mammals, fish (D1.4), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), and contaminants and contaminants in seafood (D8, D9). - The Member State considers that GES will be achieved by 2020 for seabed habitats (D1, 4, 6), non-indigenous species (D2), marine litter (D10) and underwater noise and energy (D11). The Member State considers that GES has already been achieved for hydrographical changes (D7). - The programme includes measures that are based on commitments to existing European policies and regional conventions, such as the Habitats Directive, the Maritime Spatial Planning Directive (D1, 4, 6, D7), HELCOM (D1.4.6, D10, D11), the IMO-BMW Convention (D2), the National eel management plan (among other species-specific regulations), the Common Fisheries Policy (D3), the Water Framework Directive (D5, D7), EIA and SEA Directives (D7), the Environmental Quality Standards Directive and the Stockholm Convention (D8, D9). - It also includes both existing and new measures that complement those already in place that specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures. These measures address more than one descriptor at a time (D1, 4, 6, D2, D3, D7 and D11) and therefore contribute towards GES and targets for several descriptors. Measures include studies for the potential establishment of new MPAs and management plans for the existing MPAs. - The programme combines direct and indirect measures. Most measures directly address pressures on the marine environment. Indirect measures complement the direct ones, including awareness raising and dissemination. - Based on the information reported by Finland on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2016 (with few being 2017). - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D11), the Member State reports research efforts. This will allow addressing knowledge gaps but also to build upon the results to design measures, which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - The spatial scope of the measures is specified consistently across the programme.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for water column and seabed habitats (D1, 4, 6), non-indigenous species (D2), marine litter (D10) and underwater noise and energy (D11). - The Member State considers that GES will not be achieved by 2020 for birds,

	<p>fish, mammals, water column habitats (D1, 4), commercial fish and shellfish (D3), eutrophication (D5), contaminants (D8) and for contaminants in seafood (D9). Exceptions are applied for commercial fish and shellfish (D3), eutrophication (D5) and for contaminants in seafood (D9), but not for the other descriptors for which doubts about achieving GES by 2020 are raised.</p> <ul style="list-style-type: none"> - In rare cases, sufficient links with existing EU policies and international agreements are not made (e.g. D9 and D11). - The programme includes spatial measures that do not always provide clear and specific information on the representation of species and habitats within the MPAs, the size, number and location of MPAs and the conservation objectives of the MPAs. - 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 Member State does not make sufficient links between the existing measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This prevents understanding how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - The Member State often refers to regional agreements without providing details on actions that are/will be put in place.
D2 — Non-indigenous species	
Strengths	- The programme addresses the introduction of non-indigenous species by tackling shipping via ballast water management (link to the BWMC).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the introduction of non-indigenous species from aquaculture (identified as a source of this pressure by Finland in its Article 8 report). - It is unclear if hull-fouling in relation to shipping is addressed. - It is unclear whether the measures cover recreational vessels.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the selective extraction of species (including incidental by-catch) from fisheries, including recreational fishing. - It includes seasonal and spatial fishing bans (for several purposes including stock management and biodiversity conservation) that are in addition to existing CFP measures. - The measures cover stocks managed at the national level, non-targeted species as well as age/size structure.
Weaknesses	- None (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a grounded justification, detailed below).
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient enrichment from agriculture/forestry, industry, urban activities, shipping and fisheries. - The programme is consistently based on the WFD. Measures for eutrophication draw from Finland's River Basin Management Plan. 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 (i.e. mainly agriculture,

	<p>industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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.
Weaknesses	<ul style="list-style-type: none"> - None (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a grounded justification, detailed below).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses interferences with hydrological processes from dredging and marine mining. - It refers to existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - The programme exploits synergies with the EIA and SEA Directives, as well as with the WFD. - The programme addresses acidification.
Weaknesses	<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 Finland.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants and accidental pollution through measures that target shipping, industry and urban activities. - It addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas) and sea-based sources (e.g. shipping), as well as their impacts on marine ecosystems. - The programme addresses atmospheric deposition of contaminants.
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.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter by covering land-based (e.g. industry, tourism) and sea-based (e.g. fisheries, shipping) sources of litter. - It 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 covers both macro and micro-litter. - The programme includes awareness raising efforts in addition to direct measures.
Weaknesses	<ul style="list-style-type: none"> - None (except the fact that GES and targets are partially addressed, mentioned above).
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses underwater noise from shipping and port operations.
Weaknesses	<ul style="list-style-type: none"> - It identifies heat as a local pressure but no measures seem to address this aspect.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch) from

	<p>fisheries.</p> <ul style="list-style-type: none"> - It addresses impacts on breeding and refuge areas and biological disturbance caused by various activities (e.g. from shipping, fishing, recreation, private boat traffic).
Weaknesses	<ul style="list-style-type: none"> - Finland's programme does not explain how the effects of non-indigenous species and marine litter on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses biological disturbances from various activities (shipping, fishing, recreation and private boat traffic, activities with impacts on flow conditions and other). - It includes spatial protection measures to complement commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats.
Weaknesses	<ul style="list-style-type: none"> - The programme only addresses the extraction of species (incl. by-catch) from fisheries, indirectly.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), physical loss and damage, as well as impacts from contaminants. Various activities (e.g. fisheries and shipping, private boat traffic). - It includes spatial protection measures to address several pressures such as by-catch and protecting migratory species by ensuring a coherent network of MPAs.
Weaknesses	<ul style="list-style-type: none"> - The programme does not fully explain how impacts of marine litter and underwater noise on mammals are addressed (underwater noise is indirectly addressed). It is possible that these pressures are addressed by the groups of measures reported for marine litter (D10) and underwater noise and energy (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 includes measures that are relevant to water column habitats (spatial protection measures and measures aiming at improving seabed habitat condition and reduce waste water runoff) although they are not specific to this habitat.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses pressures on water column habitats, as no specific water column habitat measure have been reported and the Member State does not clearly identify how measures reported under other descriptors (e.g., D2, D5, D8) will address relevant pressures on this habitat. - The water column, although considered in other descriptors, is mainly covered by the Member State 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Finland's

	waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical loss from fisheries (indirectly, but bottom trawl fisheries are not occurring within Finnish waters and therefore these activities do not impact the seabed), dredging and other, not reported, activities. - It addresses physical damage from dredging, shipping and other, not reported, activities. - The programme addresses nutrient enrichment in relation to seabed habitats.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme addresses marine-based renewable energy generation (reported in Article 8 by most of the neighbouring Member States). - The programme of measures mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - Most measures relate to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species and marine litter.
Exceptions	
<p>Finland applies an exception for commercial fish and shellfish (D3). It applies Article 14(1)(e) (‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’). It will take time for the measures to actually reduce exploitation rates and allow for fish species, such as sea trout, pike, perch and other migratory whitefish species, to achieve a sustainable stock status. Finland points to an expected time-lag between measure implementation and a noticeable increase in fish abundance, thus it applies this exception.</p> <p>This assessment finds the justification to be grounded. Nevertheless, the Member State does not specify when GES is expected to be achieved as per the MSFD requirements (in relation to Article 14(1)(e)).</p>	
<p>The Member State 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’). Due to natural conditions, historically contaminated seabed sediments will recover slowly and continue to cause eutrophication effects for several years.</p> <p>This assessment finds the justification to be grounded. It should be noted that the Member State does not specify when GES is expected to be achieved as per MSFD requirements (in relation to Article 14(1)(e)). It explains that nutrient loads to the sea will not be met until the end of the next MSFD implementation cycle (2018-2024).</p>	
<p>The Member State applies an exception for contaminants in seafood (D9). It applies Article 14(1)(a) and (e) (‘action or /inaction for which the Member State is not responsible’ and ‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’). According to Finland, persistent pollutants are still found in high concentrations in sediments and biota, namely dioxins and polychlorinated biphenyls. The sources of these are identified as being past pollution events in Finland and continuing pollution from other countries in the Baltic Sea (transboundary pollution). Current pollution from Finland is addressed through the D8/D9 measures.</p>	

This assessment finds the justification to be grounded. Nevertheless, the Member State does not specify when GES is expected to be achieved as per MSFD requirements (in relation to Article 14(1)(e)).

Recommendations for Finland to consider in its programme of measures:

General

- In general, the Finland's programme of measures should better address certain pressures and activities. These are specified in the descriptor specific recommendations below.
- The Member State should fully address GES and targets for water column and seabed habitats (D1, 4, 6), non-indigenous species (D2), marine litter (D10) and underwater noise and energy (D11).
- The Member State should strive to determine the timelines for achieving GES and, where there are delays beyond 2020, to report exceptions provided these are adequately justified (relevant to D8 and biodiversity-related descriptors). Furthermore, if GES is not expected to be achieved by 2020, then the Member State should estimate the alternative dates by when GES will be achieved (relevant also to D3, D5 and D9).
- The programme of measures should establish more links with existing EU policies and international instruments for D9 and D11.
- Finland should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs and the policies and measures that will be in place within these areas).
- The Member State should quantify the pressures present in its waters and their expected level of 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 groups of existing 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 provide more details on actions put in place under regional agreements.
- The Member State should ensure coherence of its determinations of GES, environmental targets and the programme of measures. This would allow for the use of environmental targets systematically as milestones towards achieving GES through the measures, and monitor this progress through the MSFD monitoring programmes. This is applicable mainly to birds, mammals, fish, water column habitats and seabed habitats (D1, 4, 6).

D2 — Non-indigenous species

- The Member State should establish measures to address the introduction of non-indigenous species from aquaculture.
- It should establish measures to address hull-fouling in relation to shipping.
- The Member State should establish measures to address recreational activities.

D7 — Hydrographical changes

- The Member State should address cumulative impacts on habitats by multiple stressors.
- Finland 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 explain better the manner in which the D8 measures contribute to D9 targets. - It should also provide better justifications for the reported risks of not achieving GES by 2020, for contaminants (D8).
D10 — Marine litter
<ul style="list-style-type: none"> - Finland 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 establish measures to address heat pollution (local pressure identified by Finland).
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should specify how pressures on birds beyond by-catch are addressed (or will be addressed), namely the effects of non-indigenous species and ingestion of litter.
D1, 4 — Fish
<ul style="list-style-type: none"> - It should establish measures directly addressing the extraction of species from fisheries.
D1, 4 — Mammals
<ul style="list-style-type: none"> - Finland should specify how pressures on mammals beyond by-catch are addressed (or will be addressed), namely litter and underwater noise.
D1, 4 — Water column habitats
<ul style="list-style-type: none"> - The Member State should more clearly indicate which measures reported under other descriptors address pressures for water column habitats (and plankton communities), and elaborate on how GES and targets for water column habitats are expected to be achieved.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none"> - The Member State should clearly address marine-based renewable energy generation. - It should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - The Member State should more clearly indicate which measures reported under other descriptors address pressures for seabed habitats, and further elaborate on how GES and targets for seabed habitats are expected to be achieved.
Exceptions
The Member State should specify when it expects GES to be achieved in relation to Article 14 (1)(e) (relevant for D3, D5, D9).

7. France

General conclusions on France's programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme of measures addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), contaminants in seafood (D9), marine litter (D10), underwater noise and energy (D11), birds, fish, and mammals (D1, 4) and seabed habitats (D1, 4, 6). - In the Mediterranean Sea, the programme of measures addresses GES and targets for contaminants in seafood (D9), underwater noise and energy (D11), birds, fish, and mammals (D1, 4) and seabed habitats (D1, 4, 6). - The Member State considers that GES will be achieved by 2020 for all descriptors in both regions. - The programme includes measures that are based on commitments to existing European policies, such as the Birds and Habitats Directives (D1, 4, 6), Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the Water Framework Directive (WFD; D5, D7, D8, D1, 4, 6), the Strategic Environmental Assessment (SEA; D7), the Industrial Emissions Directive (D8), Regulation (EC) No 782/2003 on the prohibition of organotin compounds of ships (D8), Regulation (EC) No 1881/2006 on setting maximum levels for certain contaminants in foodstuffs (D9, in the North-East Atlantic), the Environmental Impact Assessment (EIA) Directive (D7), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D8), the IMO-Ballast Water Management Convention (D2) or IMO — Guidelines on underwater noise and energy (D11, in the North-East Atlantic) and regional actions such as the UNEP/MAP action plan for marine litter (D10). - The programme includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - It includes spatial protection measures (including MPAs). These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures include the strengthening of MPA networks, the designation of new MPAs and the establishment of management measures within MPAs. - 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. - Based on the information reported by France on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2015-2020 (except for two measure to be implemented by 2021).

	<ul style="list-style-type: none"> - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D8, D9 and 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. - The programme provides the spatial scope of all measures. - 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 allows for better understanding how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats.
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme partially addresses GES and targets for eutrophication (D5), hydrographical changes (D7), contaminants (D8) and water column habitats (D1, 4). - In the Mediterranean Sea, the it partially addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants (D8), marine litter (D10) and water column habitats (D1, 4). - In some cases, the programme does not include sufficient links to existing European policies and international instruments. It is especially the case for eutrophication (D5), hydrographical changes (D7), contaminants (D8), contaminants in seafood (D9) and underwater noise (D11). - France's 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 representation of species and habitats within the MPAs, the size, number, and location of MPAs and the conservation objectives of the MPAs. - 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.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses introductions of non-indigenous species through aquaculture and shipping (including recreational) via ballast water management (measures linked to the implementation of the BWMC) and anti-fouling measures. - In the Mediterranean Sea, the programme addresses introductions of non-indigenous species through fisheries, aquaculture and shipping (including recreational) via ballast water management (measures linked to the implementation of the BWMC). - It includes warning systems for introductions of non-indigenous species as measures in both regions.
Weaknesses	<ul style="list-style-type: none"> - In the Mediterranean Sea, the programme does not cover hull-fouling in relation to shipping.
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 in the North-East Atlantic.

	<ul style="list-style-type: none"> - It includes seasonal and spatial fishing bans (for several purposes, including; stock management, biodiversity conservation, and protection of over-exploited stocks) in addition to existing CFP measures in both regions. - The measures cover stocks managed at the national level (including non-TAC species) as well as aspects that relate to age/size structure of species in both regions.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include sufficient efforts to fully cover fisheries (commercial and recreational) in the Mediterranean Sea.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - In both regions, the programme addresses nutrient inputs from industry, agriculture, shipping and urban areas. - It draws from the Member State's WFD River Basin Management Plans (RBMP), ensuring synergies with the implementation of the WFD. 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment. - It addresses atmospheric deposition of nutrients (NOx) from various sea-based and land-based sources.
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme does not address nutrient inputs from aquaculture. - In the Mediterranean Sea, it does not address nutrient inputs from recreational activities.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses hydrographical changes due to urban areas, aquaculture, industry, agriculture, land claim and coastal defence. - In the Mediterranean Sea, the programme addresses hydrographical changes due to land claim and coastal defence. - It includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - The programme also includes MSFD specific measures beyond existing regulatory frameworks. - The programme addresses cumulative impacts, i.e. impacts from different/multiple human activities/projects 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.
Weaknesses	<ul style="list-style-type: none"> - In the Mediterranean Sea, the programme does not addresses hydrographical changes from industry and agriculture.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of contaminants and accidental pollution through measures that target industry, agriculture, urban area, port operations, the dumping of munitions, shipping and solid waste disposal in both regions (it also includes measures on wrecks in the

	<p>Mediterranean Sea).</p> <ul style="list-style-type: none"> - The programme addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas) and sea-based sources (e.g. shipping). - The programme addresses atmospheric deposition of contaminants in both regions. - In the North-East Atlantic, it includes dedicated measures for contaminants in seafood (D9).
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme addresses the biological effect of contaminants. - In the Mediterranean Sea, the programme does not include dedicated contaminants in seafood (D9) measures. - Again in the Mediterranean Sea, it does not 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 addresses marine litter, by covering fisheries, aquaculture, industry, urban areas, port operations, shipping and tourism/recreational activities in both regions. - It addresses the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter in both regions. - The programme addresses macro-litter with few measures targeting litter removal in both regions.
Weaknesses	<ul style="list-style-type: none"> - The programme does not yet fully address micro-litter in both regions (knowledge gaps are mentioned). - Although France refers to ‘degradation products’ in its GES and target definitions, no direct measures are in place to tackle these degradation products. - Due to the lack of knowledge and reporting on the effects of marine litter on biota, it is unclear how France will interpret and address the issue of having ‘no harmful effects on marine life and habitats’, although this aspect has been included in the GES definition.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses impulsive and continuous noise through measures that cover marine mining, offshore structures, urban areas, seismic research and shipping. - In the Mediterranean Sea, the programme addresses impulsive and continuous noise through measures that cover port operations, seismic research and shipping. - In both regions, the programme includes research efforts that aim to collect additional data and conduct studies to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with recommendation from TG Noise. - In the North-East Atlantic, the programme links to international organisations (Agreement on the conservation of Small Cetaceans of the Baltic and North Seas — ASCOBANS), especially in the North-East Atlantic. - Again in the North-East Atlantic, the programme refers to IMO Guidelines on underwater noise.
Weaknesses	<ul style="list-style-type: none"> - The programme addresses impacts of other energy inputs (such as heat or

	<p>light) only regarding seabirds in the Mediterranean region (other species and the North-East Atlantic are not covered).</p> <ul style="list-style-type: none"> - In both regions, the programme does not refer to the EIA Directive. - In the Mediterranean Sea, it does not refer to IMO's Guidelines on underwater noise.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses the extraction of species (incl. by-catch) and effects of marine litter on birds. - In the Mediterranean Sea, the programme addresses the extraction of species (incl. by-catch), underwater noise, non-indigenous species, and disturbances from light. - The measures covers birds' food sources in both regions.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how the effects of non-indigenous species (in the North-East Atlantic) and marine litter (in the Mediterranean Sea) on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses the extraction of species (incl. accidental by-catch), physical loss and damage, impact on fish habitats and marine litter from fisheries, marine mining and aquaculture. - In the Mediterranean Sea, the programme addresses selective extraction of species (incl. accidental by-catch), impact on fish habitats, hydromorphological changes and contaminants from various activities such as fisheries or industry. - It includes spatial protection measures to complement measures reported for commercial fish and shellfish (D3) addressing functional fish habitats in both regions.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not specify which non-commercial species it addresses. - In the Mediterranean Sea, it does not include specific measures or plans for cephalopod species.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses the extraction of species (incl. accidental by-catch), impacts on mammal habitats and marine litter from fisheries and aquaculture. - In the Mediterranean Sea, the programme addresses the extraction of species (incl. accidental by-catch), impacts on mammal habitats (due for example to shipping) and underwater noise from fisheries, shipping and recreational activities.
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme does not address the effects of underwater noise and contaminants on mammals as well as impacts of shipping (collisions with mammals). - In the Mediterranean Sea, the programme does not address the effects of contaminants and marine litter on mammals. It is possible that these pressures are addressed by the groups of measures reported for contaminants (D8),

	marine litter (D10) and underwater noise and energy (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	- In both regions, the programme includes specific measures addressing water column habitats.
Weaknesses	- Despite the fact that specific measures address these habitats in both regions, the programme of measures partially addresses pressures on water column habitats, as the Member State does not clearly identify how measures reported under other descriptors (e.g. D2, D5, D8) will address relevant pressures on this habitat. - The water column, although considered in other descriptors, is mainly covered by the Member State 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	- In the North-East Atlantic, the programme addresses physical damage from fisheries, marine mining, dredging, submarine cable, tourism and recreational activities. - In the Mediterranean Sea, the programme addresses physical damage from fisheries, dredging, tourism and recreational activities, and offshore structures. - In the North-East Atlantic, it addresses physical loss from dredging and solid waste disposal, aquaculture and submarine cable. - In the Mediterranean Sea, the programme addresses physical loss from land claim and coastal defence and solid waste disposal. - The programme includes existing measures that target destructive fishing practices (trawling), within and outside spatially protected areas. - The programme covers recreational activities other than recreational fishing that could still be destructive to seabed habitats (e.g. vessels mooring).
Weaknesses	- In the North-East Atlantic, the programme does not address physical damage from seaweed harvesting and marine research. - In the Mediterranean Sea, it is not clear whether the programme addresses physical damage from marine mining and submarine cable (they should be covered by general measures). - In the North-East Atlantic, the programme does not address physical loss from seaweed harvesting, land claim and coastal defence as well as port operations. - In the Mediterranean Sea, it is not clear whether the programme addresses physical loss due to aquaculture, port operations and submarine cables (they should be covered by general measures). - Spatial protection measures are often lacking in detail on their area coverage, 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 (D2) and eutrophication (D5) in both regions as well as marine litter (D10) in the Mediterranean Sea.
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Recommendations for France to consider in its programme of measures:

General	
<ul style="list-style-type: none"> - In general, the Member State should better address certain pressures and activities. These are specified in the descriptor specific recommendations below. - In the North-East Atlantic, GES and targets definitions should be better addressed for eutrophication (D5), hydrographical changes (D7), contaminants (D8) and water column habitats (D1, 4). In the Mediterranean Sea, GES and targets definitions should be better addressed for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants (D8), marine litter (D10) and water column habitats (D1, 4). - The programme should establish more links with existing EU policies and international instruments for eutrophication (D5), hydrographical changes (D7), contaminants (D8), contaminant in seafood (D9) and underwater noise and energy (D11). - The Member State should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs). - France should quantify the pressures present in its waters and their expected level of 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 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. 	
D2 — Non-indigenous species	
<ul style="list-style-type: none"> - The Member State should cover hull-fouling in relation to shipping in the Mediterranean Sea. 	
D3 — Commercial fish and shellfish	
<ul style="list-style-type: none"> - The Member State should establish more measures to fully cover fisheries (both commercial and recreational) in the Mediterranean Sea, where it exerts a significant pressure on stocks. 	
D5 — Eutrophication	
<ul style="list-style-type: none"> - France's programme should cover aquaculture in the North-East Atlantic and recreational activities in the Mediterranean Sea. 	
D7 — Hydrographical changes	
<ul style="list-style-type: none"> - The Member State should cover industry and agriculture in the Mediterranean region; or clearly report which of the other descriptor measures will contribute to addressing pressure, GES and targets for hydrographical changes (D7) and how. - It should consider assessing the scale of past impacts. - The Member State should clarify how it will address pressures from activities not subject to local/project scale EIAs (e.g. fishing, shipping). In some cases (e.g. hydrological changes where local dimension is important), this uncertainty may jeopardise the assessment of 	

cumulative effects.
D8/D9 — Contaminants and contaminants in seafood
<ul style="list-style-type: none"> - The Member State should establish clear measures to address the biological effect of contaminants. - The Member State should establish more dedicated measures for contaminants in seafood (D9) in the Mediterranean Sea. - The Member State should better explain the way the measures for contaminants (D8) contribute to contaminants in seafood (D9) targets, in the Mediterranean Sea especially.
D10 — Marine litter
<ul style="list-style-type: none"> - The programme should address micro-litter better, preferably through direct measures, in addition to indirect measures, in accordance with recommendations of TG Litter. - France should establish measures that clearly address marine litter degradation products and ensure that litter does not cause harm to the coastal and marine environment, as suggested in its GES and targets definitions. - The Member State should establish additional research efforts to address data gaps, increase knowledge and pave the way for direct action. - The Member State should make 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"> - France's programme should establish measures that address additional aspects of this descriptor, such as heat and light for several species groups and in both regions. - The Member State should make more efforts to address data gaps and consolidate research results in all regions to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable to then define more concrete and direct measures to address underwater noise in the second MSFD implementation cycle.
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to address pressures on birds beyond by-catch. Measures could target disturbances on nesting sites by predation in the North-East Atlantic, effects of non-indigenous species in the North-East Atlantic and litter ingestion in the Mediterranean Sea. 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"> - The Member State should establish measures that include additional MPAs in open sea areas to protect non-commercial fish species from various pressures (non-indigenous species, by-catch, noise and contaminants). 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. - In the Mediterranean Sea, France should establish specific measures or plans for cephalopod species. - The programme 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 the Member State's territorial waters, and how they are protected.
D1, 4 — Mammals
<ul style="list-style-type: none"> - The Member State should establish additional measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammal habitats due to shipping (collision), underwater noise and contaminants in the North-East Atlantic; contaminants and marine litter in the Mediterranean Sea). 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 more clearly indicate which measures reported under other descriptors address pressures for water column habitats, and elaborate on how GES and targets for water column habitats are expected to be achieved.
- France's programme should establish measures targeting plankton.

D1, 4, 6 — Seabed habitats

- In the North-East Atlantic, the Member State should establish measures covering the impacts of seaweed harvesting and marine research on physical damage, as well as measures targeting the effects of seaweed harvesting, land claim and coastal defence and port operations on physical loss. In the Mediterranean Sea, the Member State should clearly specify whether the measures cover the impacts of marine mining and submarine cables on physical damage, as well as the effects of aquaculture, port operations and submarine cable on physical loss.
- 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 in the Mediterranean Sea), the expected effect that measures are to have on seabed habitats should be explained.

8. Ireland

General conclusions on Ireland's programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Ireland's programme of measures addresses GES and targets for birds (no targets are defined), fish, mammals (D1, 4), non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants (D8), contaminants in seafood (D9) and underwater noise and energy (D11). - The Member State considers that GES will be achieved by 2020 for biodiversity (D1, 4, 6), non-indigenous species (D2), commercial fish and shellfish (D3), marine litter (D10) and underwater noise (D11). The Member State considers GES is already achieved for eutrophication (D5) and contaminants in seafood (D9). - The programme exploits synergies with existing international, EU and regional measures and processes in all descriptors. For example: the Birds and Habitats Directives (D1, 4, 6; D2), the IMO-Ballast Water Management Convention (D2), OSPAR Convention (D2, D3, D7, D9, D10), the Water Framework Directive (D2, D3, D5, D7, D8, D9), the Common Fisheries Policy (D1.4; D3) the Urban Waste Water Treatment Directive (UWWTD) (D5, D10), the Nitrates Directive (D5), the Industrial Emissions Directive (D5), the Environmental Impact Assessment Directive (D5), the Strategic Environmental Assessment Directive (D5, D7), the Maritime Spatial Planning Directive (D1, 4, 6, D5, D7, D11) and the National Emissions Ceiling Directive (D5), IMO-MARPOL and the Stockholm Convention (D8), the Environmental Quality Standards Directive (D8), the REACH Regulation and Regulation (EC) No 1881/2006 (levels of contaminants in foodstuffs) (D9). - The programme includes spatial protection measures. These measures address more than one descriptor at a time (D1, 4, 6; D3 and D7) and therefore contribute towards GES and targets for several descriptors. Measures include studies for the potential establishment of new MPAs and management plans for the reported MPAs. - IT combines direct and indirect measures. Most measures directly address pressures on the marine environment. Indirect measures complement the direct ones, focusing on awareness raising, dissemination and governance.
Weaknesses	<ul style="list-style-type: none"> - The programme only partially addresses GES and targets for water column habitats (D1, 4), seabed habitats (D1, 4, 6), and marine litter (D10). - The Member State does not provide a timeline for when GES is expected to be achieved for hydrographical changes (D7) and contaminants (D8). - The Member State does not provide sufficient details about the measures to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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 representation of species and habitats within the MPAs, the size, number, and location of

	<p>MPAs and the conservation objectives of the MPAs.</p> <ul style="list-style-type: none"> - The spatial scope of the measures is not specified for any measures. - It sometimes includes data collection efforts, as measures. - 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 Member State does not report on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation. No conclusions are therefore possible on the likelihood of the programme of measures being implemented.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species from aquaculture, shipping (ballast water and hull-fouling), tourism and recreation, including recreational yachting.
Weaknesses	None identified.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by commercial and recreational fishing. - It proposes seasonal and 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.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the extraction of species by seaweed and other sea-based harvesting, although it was identified it as relevant pressures/activities. - It lacks sufficient detail to determine whether commercially-important stocks that are not covered by the CFP will be addressed through the reported measures.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - Ireland's programme addresses nutrient enrichment from agriculture, urban activities, industry, aquaculture, shipping. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme relies on WFD measures, this statement is subject to the 2016 RBMPs being assessed as adequate under the WFD assessment. - The programme addresses atmospheric deposition of nutrients (NO_x) from sea-based (linked to IMO-MARPOL) and land-based (linked to the IED and NEC Directives) sources.
Weaknesses	- None identified.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses the interference of hydrological processes from renewable energy, dredging port operations, land claim and coastal defence, as well as marine hydrocarbon extraction. - It includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures

	are addressed in terms of hydrographical changes.
Weaknesses	- The programme does not address cumulative impacts, i.e. impacts on hydrography from different/multiple human activities/projects. 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 (D9)	
Strengths	- The programme addresses contaminant inputs to the sea from land-based (e.g. agriculture, industry, urban activities and port operations) and sea-based (e.g. shipping, marine mining, hydrocarbon extraction, dredging and aquaculture) sources, as well as the biological effect of contaminants. - It addresses accidental pollution from fisheries, shipping, hydrocarbon extraction, placement and operation of offshore structure and industry. - The programme addresses atmospheric deposition of contaminants. - It addresses contaminants in seafood (D9) via both D8- and D9-specific measures.
Weaknesses	- It however 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	- The programme addresses marine litter from fisheries, shipping, port operations, aquaculture, industry, tourism, offshore activities, urban, dredging and hydrocarbon extraction. - It addresses macro- and micro-litter. - The programme includes awareness-raising efforts.
Weaknesses	- Due to the lack of knowledge and reporting on the effects of marine litter on biota, it is unclear how Ireland will interpret and address the issue of having 'no harmful effects on marine life and habitats', although this aspect has been included in the GES definition.
D11 — Underwater noise and energy	
Strengths	- The programme addresses underwater noise from hydrocarbon extraction, pile driving and seismic surveys, shipping, marine research surveys and educational activities, fisheries, dredging, land claim and coastal defence. - The programme includes a measure that implements a register for underwater noise events.
Weaknesses	- The programme does not address other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	- The programme addresses incidental by-catch from fisheries and habitat loss. It also covers biological disturbance from fisheries, the introduction of non-indigenous species, hunting, wildlife watching, contaminants from the use of pesticides, marine operations potentially causing accidental pollution, and offshore oil and gas production.
Weaknesses	- The programme does not explain how the effects of marine litter on seabirds are addressed. It is possible that these pressures are addressed by the measures reported for marine litter (D10), but based on the information reported this cannot be confirmed.
D1, 4 — Fish	
Strengths	- The programme addresses incidental by-catch from fisheries and habitat

	<p>loss. It also covers biological disturbance from fisheries, contaminants from the use of pesticides, marine operations potentially causing accidental pollution, and offshore oil and gas production.</p> <ul style="list-style-type: none"> - It includes spatial protection measures to complement measures on commercial fish and shellfish (D3) and to protect non-commercial species as well as functional fish habitats.
Weaknesses	<ul style="list-style-type: none"> - None identified.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme address incidental by-catch from fisheries and habitat loss. It covers biological disturbance from fisheries, hunting, wildlife watching, underwater noise, contaminants from the use of pesticides, marine operations potentially causing accidental pollution, and offshore oil and gas production.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how impacts from marine litter on mammals are addressed. It is possible that these pressures are addressed by the measures reported for marine litter (D10), but based on the information reported this cannot be confirmed.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme includes measures that are relevant to water column habitats (spatial protection measures) although they are not specific to water column habitat.
Weaknesses	<ul style="list-style-type: none"> - The programme only partially addresses pressures on water column habitats, as no specific water column habitat measure have been reported and the Member State does not clearly identify how measures reported under other descriptors (e.g., D2, D5, D8) will address relevant pressures on water column habitats. - The water column, although considered in other descriptors, is mainly covered by the Member State in terms of water quality. The plankton communities of the water column are a key feature of the Ireland's monitoring programmes, but are rarely referenced in the biodiversity measures. Additionally, the water column is a key transfer route for the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, including in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical loss and damage from fisheries, dredging and disposal, marine hydrocarbon extraction (oil and gas), land claim and coastal defence, placement and operation of offshore structures, submarine cable and pipeline operations, solid waste disposal including dredge material and other non-specified activities. - The programme addresses contaminants and marine litter due to industry and aquaculture, in respect to seabed habitats.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the Ireland's programme of measures addresses recreational activities. - It mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of

bottom trawling outside of these spatially protected areas.

Recommendations for Ireland to consider in its programme of measures:

General

- In general, Ireland should better address certain pressures and activities in its programme of measures. These are specified in the descriptor-specific recommendations below.
- Ireland should establish measures to better address GES and targets for water column habitats (D1, 4), seabed habitats (D1, 4, 6) and marine litter (D10) better.
- The Member State should develop more research efforts to fill knowledge gaps and provide an assessment of when GES will be achieved.
- It should strive to determine the timelines for achieving GES and, where there are delays beyond 2020, to report exceptions provided these are adequately justified. Furthermore, if GES is not expected to be achieved by 2020, then the Member State should estimate the alternative dates by when GES will be achieved.
- The Member State should ensure coherence of its determinations of GES, environmental targets and the programme of measures. This would allow to use environmental targets systematically as milestones towards achieving GES through the measures, and monitor this progress through the MSFD monitoring programmes. This is specially missing for birds, mammals and water column habitats (D1, 4).
- Ireland 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, the conservation objectives of the MPAs).
- The Member State should define the spatial scope of its 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 all marine waters.
- It 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 quantify the pressures present in its waters and their expected level of reduction as a result of the measures being implemented. 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 to the targets and hence to the achievement of GES.
- Ireland's programme should clearly identify the timelines for implementation, secured funding, and the entities in charge of implementation for all their measures.

D3 — Commercial fish and shellfish

- The Member State should address the extraction of seaweed and other species for sea-based food harvesting.
- It should provide more detail in order to determine whether commercially important stocks that are not covered by the CFP are addressed through the reported measures.

D7 — Hydrographical changes

- Ireland should address cumulative impacts on habitats by multiple activities/developments.
- It should address better pressures from activities which are 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.
D8/9 — Contaminants and Contaminants in seafood
- The Member State should better explain the way the contaminants (D8) measures contribute to contaminants in seafood D9 targets.
D10 — Marine litter
- Ireland's programme should address litter impacts on marine biota. - It should make efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
D11 — Underwater noise
- Ireland should establish measures addressing other energy inputs (e.g. heat or light).
D1, 4 — Birds
- The Member State should specify how impacts on birds from marine litter are addressed (or will be addressed).
D1, 4 — Mammals
- The Member State should specify how impacts on mammals from marine litter are addressed (or will be addressed).
D1, 4 — Water column habitats
- The Member State should more clearly indicate which measures reported under other descriptors address pressures on water column habitats (and plankton), and elaborate on how GES and targets for water column habitats are expected to be achieved.
D1, 4, 6 — Seabed habitats
- Ireland should establish measures clearly covering recreational activities. - The Member State should establish more measures that extend beyond spatially protected areas to ensure a wider spatial coverage of measures for seabed habitats. - Its programme should provide timescales and estimates of how spatial restrictions on seabed damaging activities will allow for GES to be achieved. - The Member State should more clearly indicate which measures reported under other descriptors address pressures for seabed habitats, and elaborate on how GES and targets for seabed habitats are expected to be achieved.

9. Italy

General conclusions on Italy's programme of measures

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Italy's programme of measures addresses GES and targets for birds, mammals and reptiles (D1, 4), non-indigenous species (D2), eutrophication (D5), contaminants in seafood (D9), marine litter (D10). - The Member State has brought together and coordinated existing national measures and processes (related to the implementation of EU legal acts and regulations, as well as regional commitments to protect the marine environment more efficiently), and also established new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - The programme includes measures that are based on commitments to existing European policies and legislation, as well as regional and international agreements, such as the Barcelona Convention (D2, D3, D5, D10, D1, 4, 6), the Birds and Habitats Directives (D1, 4, 6, D2, D3), the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area — ACCOBAMS (D1.4.6), Regulation (EC) No 708/2007 on the use of alien species aquaculture (D2), Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (D2), the General Fisheries Commission for the Mediterranean (GFCM; D1, 4, 6; D3), the Common Fisheries Policy (D1, 4, 6; D3), the Bern Convention on the Conservation of European Wildlife and Natural Habitats (D3), the CITES Convention (D3), the Water Framework Directive (WFD; D5, D7, D8), the SEA and EIA Directive (D7, D10), the MSP Directive (D7), the REACH regulation (D8), the Environmental Quality Standards Directive (D8), the Bathing Water Directive (D8), the Waste Directive and Directive 2000/59/EC on port reception facilities (D10). - The programme includes spatial protection measures (including MPAs). Often, these measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures especially include the strengthening of MPA networks and the establishment of management measures within MPAs. - It combines direct and indirect measures, thus directly addressing pressures on the marine environment, while simultaneously implementing measures complementing the direct measures through governance and coordination actions, as well as awareness raising efforts. - Based on the information reported by Italy on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2016. - The spatial scope of the measures is specified consistently across the programme of measures. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D2, D8, D10), the Member State reports

	<p>research efforts. This will allow addressing knowledge gaps but also to build upon the results to design measures, which will contribute directly to tackling the pressures in the MSFD's second implementation cycle.</p>
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for fish and cephalopods, water column habitats (D1, 4) and seabed habitats (D1, 4, 6), commercial fish and shellfish (D3), hydrological changes (D7), contaminants (D8), underwater noise and energy (D11). - 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 how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - Italy reports that the current level of scientific knowledge does not allow an assessment on whether GES will be achieved by 2020. - The Member State does not report a timeline for the achievement of GES for any descriptor. - 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.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species by tackling aquaculture, fisheries, tourism/recreational activities and shipping (including ballast water). - The programme addresses hull-fouling in relation to shipping, indirectly. - It includes early warning systems of non-indigenous species introductions as measures.
Weaknesses	<ul style="list-style-type: none"> - None (except the lack of timeline for the achievement of GES, mentioned above).
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by tackling fisheries (incl. recreational fishing). - It includes seasonal and 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.
Weaknesses	<ul style="list-style-type: none"> - The programme does not directly target sharks, as specified in Italy's targets.
D5 — Eutrophication	
Strength	<ul style="list-style-type: none"> - The programme addresses nutrient enrichment by tackling agriculture, urban areas, aquaculture, tourism and industry. - It draws from the Italy's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). 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.

Weaknesses	- None (except the lack of timeline for the achievement of GES, mentioned above).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses hydrological processes from various activities. - It includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - The programme includes MSFD specific measures, in addition to WFD measures. - It refers to EIA and SEA procedures, in addition to MSP.
Weaknesses	- Italy 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 the introduction of contaminants and accidental pollution through measures that target shipping, hydrocarbon extraction, offshore structures, agriculture aquaculture and fisheries. - It addresses contaminant inputs to the sea from land-based (agriculture), as well as sea-based sources (e.g. shipping, fisheries). - The programme also addresses accidental pollution. Measures link to the International Convention for the Prevention of Pollution from Ships (IMO-MARPOL). - It addresses contaminants in seafood (D9) via both D8 and D9 measures. - Several measures in the programme specifically address contaminants in seafood (D9) through introduction of contaminants by tackling industry, aquaculture, fisheries, agriculture and shipping. - It clearly 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.
Weaknesses	- The programme does not address urban activities nor port operations.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter by covering land-based (e.g. tourism, urban activities) and sea-based (e.g. shipping, aquaculture) sources of litter. - It addresses the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. - It also covers both macro and micro-litter, including micro-plastics.
Weaknesses	- The programme only indirectly covers tourism/recreational activities (despite being reported as a relevant source of litter in Article 8).
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses continuous and impulsive underwater noise by covering marine hydrocarbon extraction, marine research and port operations. - It includes measures that aim to implement a register for impulsive noise and develop standards for noise mapping.
Weaknesses	- The programme does not cover impacts of underwater noise on marine life.

	- It is not clear whether the programme addresses other energy inputs (e.g. heat and light).
D1, 4 — Birds	
Strengths	- The programme of measures addresses the extraction of species (incl. by-catch) and habitat loss. It also addresses trade of endangered species.
Weaknesses	- The programme does not explain how the effects of non-indigenous species and marine litter on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch) and habitat loss. It also addresses trade of endangered species and pollution impacts on fish. - It includes spatial protection measures to complement commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats. - The Member State reports that, in their MPAs, they protect all species listed in the Habitats Directive and on the Barcelona Convention list of endangered species. - The programme of measures includes awareness raising efforts.
Weaknesses	<ul style="list-style-type: none"> - The Member State's gap analysis identified a need to stimulate and increase sustainable practices for the exploitation of coastal fish species and to implement more rigorous management measures for fisheries control. It is unlikely that the awareness raising measure will be sufficient to address this gap for coastal 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 addresses the extraction of species (incl. by-catch) and habitat loss. It also addresses underwater noise and contaminants and their direct effects on mammals and reptiles. Various activities covered, including shipping and fisheries. - It includes spatial protection measures to address several pressures such as underwater noise due to shipping, by-catch and protecting migratory species by ensuring a coherent network of MPAs.
Weaknesses	- The programme does not explain how the impact of marine litter on mammals and reptiles is addressed. It is possible that these pressures are addressed by the groups of measures reported for 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 — Water column habitats	
Strengths	- The programme includes measures that are relevant to water column habitats (spatial protection measures and measures aiming at improving seabed habitat condition and reduce wastewater runoff) although they are not specific to this habitat.
Weaknesses	- The programme partially addresses pressures on water column habitats, as

	<p>no specific water column habitat measure have been reported and Italy does not clearly identify how measures reported under other descriptors (e.g., D2, D5, D8) will address relevant pressures on this habitat.</p> <ul style="list-style-type: none"> - The water column, although considered in other descriptors, is mainly covered by the Member State 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical loss and damage from fisheries, hydrocarbon exploitation and dredging. - It includes existing and new measures that target destructive fishing practices particularly in MPAs. - The programme includes measures that focus on territorial waters (but also include other spatial scopes).
Weaknesses	<ul style="list-style-type: none"> - The programme indirectly addresses physical loss and damages from underwater cables and pipelines, port operations, land claim, coastal defence, solid waste disposal. - It mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - Most measures relate to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species, eutrophication and marine litter.

Recommendations for Italy to consider in its programme of measures:

General
<ul style="list-style-type: none"> - In general, Italy should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below. - GES and targets definitions should be better addressed for fish and cephalopods, water column habitats (D1, 4), seabed habitats (D1.4.6), commercial fish and shellfish (D3), hydrographical changes (D7), contaminants (D8), underwater noise and energy (D11). - Its programme should make better links between the groups of 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 develop more research efforts to fill knowledge gaps and provide an assessment on when GES will be achieved. - Italy should quantify the pressures present in its waters and their expected level of 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.

D3 — Commercial fish and shellfish
- The Member State should establish measures specifically for sharks, as specified in its targets.
D7 — Hydrographical changes
- Italy'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
- The Member State should establish measures addressing urban activities and port operations.
D10 — Marine litter
- Italy should establish direct measures covering tourism/recreational activities. - The Member State should make efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
D11 — Underwater noise
- The Member State should establish measures addressing the impact of underwater noise on marine life and other energy inputs (e.g., heat and light).
D1, 4 — Birds
- Italy should specify how pressures on birds beyond by-catch are addressed (or will be addressed), namely the effects of non-indigenous species and ingestion of litter.
D1, 4 — Fish and cephalopods
- The Member State should consider establishing measures to directly support sustainable practices for the exploitation of coastal fish species, as well as implementing more rigorous management for fisheries control, beyond awareness raising measures. - It should clearly indicate whether it developed measures for cephalopods.
D1, 4 — Mammals
- The Member State should specify how pressures on mammals beyond by-catch are addressed (or will be addressed), namely the effects of ingestion of litter.
D1, 4 — Water column habitats
- The Member State should more clearly indicate which measures reported under other descriptors address pressures for water column habitats (and plankton), and elaborate on how GES and targets for water column habitats are expected to be achieved. - The Member State should address water column habitats beyond water quality indicators.
D1, 4, 6 — Seabed habitats
- Italy should establish direct measures covering underwater cables and pipelines, port operations, land claim, coastal defence, solid waste disposal. - It should establish more measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats. - The programme should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - The Member State should address pressures beyond physical loss and damage to seabed habitats and more clearly indicate which measures reported under other descriptors (e.g., non-indigenous species, eutrophication and marine litter) address pressures for seabed habitats, and elaborate on how GES and targets for seabed habitats are expected to be achieved.

10. Latvia

General conclusions on Latvia's programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Latvia's programme of measures addresses GES and targets for commercial fish and shellfish (D3), eutrophication (D5), contaminants (D8), contaminants in seafood (D9) and marine litter (D10). - It includes measures that are based on commitments to existing European policies, such as the Birds and Habitats Directives (D1, 4, 6), Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the Nitrate Directive (D5), the Water Framework Directive (WFD; D5, D8), Urban Wastewater Treatment Directive (UWWTD; D5), the National Emission Ceiling Directive (D5, D8), the Industrial Emissions Directive (D5, D8), the Maritime Spatial Planning Directive (all descriptors), Regulation (EC) No 782/2003 on the prohibition of organotin compounds of ships (D8) 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) or the IMO-Ballast Water Management Convention (D2) and regional actions such as HELCOM action plan on marine litter (D10) or the HELCOM Baltic Sea action plan (all descriptors). - The programme includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - It 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 efforts. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. all descriptors), 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 partially addresses GES and targets for birds, fish, mammals and water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - The measures do not address GES and targets for non-indigenous species (D2), hydrographical changes (D7), underwater noise and energy (D11). - Latvia does not report any timeline for achieving GES for non-indigenous species (D2), commercial fish and shellfish (D3), contaminants in seafood (D9), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). This may jeopardise the ability of the Member State to determine progress toward achieving GES by 2020. - Latvia reports that GES will not be achieved by 2020 for eutrophication (D5). - It also does not define GES for hydrographical changes (D7), contaminants (D8), marine litter (D10), underwater noise (D11), birds, fish and mammals (D1, 4).

	<ul style="list-style-type: none"> - In some cases, the programme does not include sufficient links to existing European policies as well as international instruments. This is the case for biodiversity (D1, 4, 6), hydrographical changes (D7), contaminants (D8), contaminants in seafood (D9) and underwater noise (D11). - The programme includes spatial protection measures. These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors, through the strengthening of MPA networks and the establishment of management measures within MPAs. However, they have indirect impacts on the pressure (research). - Even though, based on the information reported by Latvia on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high, most new measures have indirect impacts on the pressures and the timeline for implementing them is 2020. This may compromise the achievement of GES by 2020. - The Member State does not always provide sufficient details about the new measures to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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 representation of species and habitats within the MPAs, the size, number, and location of MPAs and the conservation objectives of the MPAs. - 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 scope of the measures is only specified for the new measures (not for the existing ones). It is therefore not clear whether all waters are covered. - The programme sometimes includes data collection efforts, as measures. - It over-relies on indirect measures for several descriptors (most of the new measures have indirect impacts).
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses introductions of non-indigenous species through aquaculture.
Weaknesses	<ul style="list-style-type: none"> - The programme does not directly address introduction of non-indigenous species from shipping (ballast water and anti-fouling). It is also unclear whether the measures also concern recreational vessels. - It does not include early warning systems for introductions of non-indigenous species as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial and recreational fishing. - It refers to existing CFP measures. - The measures cover stocks managed at the national level as well as aspects that relate to age/size structure of species.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme includes seasonal and/or spatial fishing bans (that could be used for several purposes, including; stock management,

	<p>biodiversity conservation, and protection of over-exploited stocks).</p> <ul style="list-style-type: none"> - The new measure aiming to develop research studies for the creation of a possible new MPA and to assess important fish spawning and nursery areas, will only be implemented in 2020, which is not in line with the MSFD timeline.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from agriculture, industry and urban areas. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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 (NO_x) (link to the Industrial Emissions Directive and the National Emission Ceiling Directive).
Weaknesses	<ul style="list-style-type: none"> - The programme does not consider additional aspects, such as improved aquaculture management practices.
D7 — Hydrographical changes	
Strengths	None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include measures to tackle hydrographical changes. It may be that pressures on hydrographical changes are addressed via measures reported for non-indigenous species (D2), eutrophication (D5) and contaminants (D8); but how the programme will contribute to addressing pressures on hydrographical changes (D7) specifically cannot be assessed based on the information reported. - Even though the programme includes a measure on cumulative impacts (i.e. impacts from different/multiple human activities on hydrography), it has an indirect impact on the pressures (research measure to define a methodology for spatial cumulative impact assessment for a variety of marine space uses).
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants through measures that target industry and urban areas. - It also addresses accidental pollution through measures that target shipping and port operations. - The programme addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas) and sea-based sources (e.g. shipping). - In its programme, Latvia addresses atmospheric deposition of contaminants (link to Industrial Emissions Directive and the National Emission Ceiling Directive).
Weaknesses	<ul style="list-style-type: none"> - The programme does not include specific measures for contaminants in seafood (D9). - It does not explain how measures for contaminants (D8) will contribute to addressing pressures for contaminants in seafood (D9) and allow progress towards GES and targets for this descriptor.

D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter by covering shipping and tourism/recreational activities. - It 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 specifically covers macro-litter with measures targeting litter removal. - It includes efforts to address knowledge gaps for micro-litter, which, while not yet fully addressing the problem, will positively contribute to better characterising the pressure and its potential impact on fauna.
Weaknesses	<ul style="list-style-type: none"> - The programme does not yet fully address micro-litter, referring to knowledge gaps which the indirect measures will address.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes efforts to address knowledge gaps for underwater noise.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address continuous and impulsive noise from any human activity. - It however does not address other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses accidental by-catch and other pressures on bird species and habitats through fisheries management measures, to some extent.
Weaknesses	<ul style="list-style-type: none"> - The programme only includes general biodiversity measures and does not include dedicated measures addressing bird species. - It does not explain how the effects of non-indigenous species, contaminants, marine litter as well as noise and light pollution on seabirds, disturbances on nesting sites by predation on birds are addressed, and does not cover birds' food sources. It is possible that these are addressed by the groups of measures for non-indigenous species (D2), contaminants (D8), marine litter (D10) and underwater noise and energy (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 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) and other pressures on fish species and habitats through fisheries management measures, to some extent.
Weaknesses	<ul style="list-style-type: none"> - The programme only includes general biodiversity measures and does not include dedicated measures addressing fish species (commercial and non-commercial), as the effect of measures under other descriptors for fish biodiversity is unclear. - Even though the programme includes a spatial protection measure to complement commercial fish and shellfish (D3), it is a research effort to determine justifications for the designation of new MPAs, in particular for functional fish habitats (i.e. spawning grounds and fish juvenile habitats). - Latvia's programme provides little information on where and how fish species present within the Member State's territorial waters are protected.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses accidental by-catch and other pressures on mammal species and habitats through fisheries management measures, to

	some extent.
Weaknesses	<ul style="list-style-type: none"> - The programme only includes general biodiversity measures and does not include dedicated measures addressing mammals. - It does not address impacts of contaminants and of shipping (collisions, underwater noise) on mammals. - The programme does not explain how contaminants and marine litter on mammals are addressed. It is possible that these pressures are addressed by the groups of measures reported for 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 does not include spatial protection measures to protect mammals.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses contaminants and nutrient enrichment and other pressures regarding water column habitats (although no specific human activity has been mentioned), to some extent.
Weaknesses	<ul style="list-style-type: none"> - The programme only includes general biodiversity measures and does not include dedicated measures addressing water column habitats. It is possible that pressures on water column habitats are addressed via measures reported for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10); but how the programme will contribute to addressing pressures on water column habitats (D1, 4) specifically cannot be determined based on the information reported. - 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme is likely to address physical loss from the dumping of dredge material. - It addresses physical damage through fisheries management measures. - The programme includes existing measures that target destructive fishing practices (trawling) especially in coastal areas.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme covers recreational activities other than recreational fishing that could still be destructive to seabed habitats (e.g. vessels mooring). - Some important pressures, particularly relating to coastal development and mineral/aggregate extraction from the seabed, are not considered in enough detail in the programme of measures. - Spatial protection measures are often lacking in detail on their area coverage, temporal ranges of restrictions. - Other pressures such eutrophication (D5) and marine litter (D10) have not been considered. It is possible that pressures on seabed habitats are addressed via measures reported for eutrophication (D5) and marine litter (D10); but

	how the programme will contribute to addressing pressures on seabed habitats (D1, 4, 6) specifically cannot be determined based on the information reported.
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Exceptions

The Member State 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'). Latvia states that GES cannot be achieved by 2020 because of natural conditions (very slow water exchange rates between the Baltic Sea and the North Sea).

This assessment finds the justification to be grounded. The Member State has estimated that it will take at least 30 to 50 years to achieve GES (this time-period was being given in the HELCOM eutrophication assessment).

Recommendations for Latvia to consider in its programme of measures:

General

- In general, the Latvia should better address certain pressures and activities in its HELCOM eutrophication assessment of measures. These are specified in the descriptor specific recommendations below.
- GES and targets definitions should be better addressed for non-indigenous species (D2), hydrographical changes (D7) and underwater noise (D11), birds, fish, mammals, water column habitats (D1, 4) and seabed habitats (D1, 4, 6).
- The Member State should strive to determine the timelines for achieving GES.
- GES and targets should be defined for hydrographical changes (D7), contaminants (D8), marine litter (D10), underwater noise and energy (D11), birds, fish and mammals (D1, 4).
- The Member State should establish more links with existing EU policies and international instruments for the biodiversity descriptors (D1, 4, 6), hydrographical changes (D7), contaminants (D8), contaminant in seafood (D9) and underwater noise and energy (D11).
- Latvia's programme should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs) and establish additional ones that have direct effects on the pressures.
- The Member State should establish more measures that have a direct impact on the pressures and implement them before 2020.
- It should provide more details about its new measures. This will allow for a better understanding of how the programme will support progress towards targets and GES for all descriptors.
- The Member State should quantify the pressures present in its waters and their expected level of 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.
- Latvia should define the spatial scope of all its measures (both existing and new) 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 all marine waters.
- It 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

<p>and effectiveness in meeting targets and GES, are measured through the monitoring programmes.</p> <ul style="list-style-type: none"> - 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.
<p>D2 — Non-indigenous species</p> <ul style="list-style-type: none"> - The Member State should establish measures having direct impact on non-indigenous species from shipping (ballast water and anti-fouling, including recreational vessels). - It should establish early warning systems for introductions of non-indigenous species as measures.
<p>D3 — Commercial fish and shellfish</p> <ul style="list-style-type: none"> - Latvia should establish measures that implement seasonal and/or spatial fishing bans in its programme. - The Member State should implement new measures within the MSFD established time-frame.
<p>D5 — Eutrophication</p> <ul style="list-style-type: none"> - The Member State should establish measures covering additional aspects, such as nutrient inputs from aquaculture.
<p>D7 — Hydrographical changes</p> <ul style="list-style-type: none"> - Latvia should establish measures to tackle hydrographical changes; or clearly report which of the other descriptor measures will contribute to addressing pressure, GES and targets for hydrographical changes (D7) and how. - It should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, shipping). In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.
<p>D8/D9 — Contaminants and contaminants in seafood</p> <ul style="list-style-type: none"> - The Member State should establish dedicated measures for contaminants in seafood (D9); or should better explain the way the contaminants (D8) measures contribute to contaminants in seafood D9 targets.
<p>D10 — Marine litter</p> <ul style="list-style-type: none"> - The Member State should address micro-litter better, preferably through direct measures. - It should establish additional research efforts to address data gaps, increase knowledge and pave the way for direct action. - In its programme, Latvia should make efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
<p>D11 — Underwater noise and energy</p> <ul style="list-style-type: none"> - The Member State should establish direct measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. shipping for continuous noise). - It should consider establishing measures that target other energy inputs if possible (e.g. heat, light).
<p>D1, 4 — Birds</p> <ul style="list-style-type: none"> - Latvia should establish additional and dedicated measures to address pressures on birds beyond by-catch. Measures could target disturbances on nesting sites by predation, effects of non-indigenous species, contaminants, noise and light pollution as well as litter ingestion. The measures should also cover 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
<ul style="list-style-type: none"> - The Member State should establish additional and dedicated measures with direct effect on pressures that include additional MPAs in open sea areas to protect commercial and non-commercial fish species from various pressures (non-indigenous species, by-catch, noise and contaminants). 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. - It 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 the Member State's territorial waters, and how they are protected.
D1, 4 — Mammals
<ul style="list-style-type: none"> - The Member State should establish additional and dedicated measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammal habitats 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
<ul style="list-style-type: none"> - The Member State should establish dedicated measures to tackle the pressure associated with water column habitats (and plankton). If these are to be addressed via measures reported for other descriptors (such as D2, D5, D8, D10), the expected effect that measures are to have on water column habitats should be explained.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none"> - Latvia should establish measures covering all aspects of recreational activities (e.g. fishing, vessels mooring, diving) and important pressures (e.g. coastal development and mineral/aggregate extraction from the seabed). - It should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - The Member State should establish measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats. - 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.

11. Malta

General conclusions on Malta's programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Malta's 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), birds, mammals and water column habitats (D1, 4). - The Member State reports that GES will be achieved by 2020 for eutrophication (D5). - The programme includes measures that are based on commitments to existing European policies, such as the Birds and Habitats Directives (D1, 4, 6, D10, D11), Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6, D10), the Nitrates Directive (D5), the Water Framework Directive (WFD; D2, D5, D7, D8, D10, D1, 4, 6), Urban Wastewater Treatment Directive (UWWTD; D5), the Strategic Environmental Assessment (SEA; D7, D11), the Port Reception Facilities Directive (D5, D8, D10), the Industrial Emissions Directive (D8, D9), Regulation (EC) No 1881/2006 on setting maximum levels for certain contaminants in foodstuffs (D9), the Waste Framework Directive (D8, D10, D1, 4, 6), the Environmental Impact Assessment (EIA) Directive (all descriptors), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D3, D5, D8, D10) or IMO — Ballast Water Management Convention (D2) and regional actions such as the UNEP/MAP Regional Plan for the Marine Litter (D10) or UNEP/MAP Action Plan on Introductions of Species and Invasive Species (D2). - The programme includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - It includes spatial protection measures (including MPAs). These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures include the strengthening of MPA networks, the designation of new MPAs and the establishment of management measures within MPAs. - 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 spatial scope of all measures is specified consistently across the programme of measures. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D8, D10, D11, D1, 4, 6), 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 partially addresses GES and targets for contaminants (D8), underwater noise and energy (D11), fish (D1, 4) and seabed habitats (D1, 4, 6). - The Member State reports that GES will not be achieved by 2020 for non-indigenous species (D2), commercial fish and shellfish (D3), contaminants (D8), contaminants in seafood (D9), marine litter (D10). Exceptions are applied (except for D8), the justifications of which are either grounded or partially grounded (please see section below on exceptions). - The Member State reports that it cannot estimate if GES will be achieved by 2020 for hydrographical changes (D7), underwater noise and energy (D11), birds, fish, mammals (D1, 4) and seabed habitats (D1, 4, 6) because of knowledge gaps. - The Member State did not define GES for water column habitats (D1, 4). - In some cases, the programme does not include sufficient links to existing European policies and international instruments. It is especially the case for eutrophication (D5), hydrographical changes (D7), contaminants (D8) and underwater noise (D11). - 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. However, the implementation timeline for the new measures spans from 2017 to 2019, which creates doubts about the timely implementation of the programme and thus its contribution to achieving progress towards GES. - The Member State does not always provide sufficient details about the measures (especially the existing ones) to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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. - Except in few cases, 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 how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - The programme sometimes includes data collection efforts as measures.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species through aquaculture, recreational yachting and shipping via ballast water management and anti-fouling measures (measures linked to the implementation of the BWMC and the Antifouling Convention²⁰). - It includes early detection systems for introductions of non-indigenous species as measures.

²⁰ International Convention on the Control of Harmful Anti-fouling Systems on Ships (IMO).

Weaknesses	- None identified (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a grounded justification, detailed below).
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial (including for vessels larger than 12 m) and recreational fishing (although there is some uncertainty about the extent to which the measure addresses this activity as the scope of the measure is limited). - It includes bans for specific fishing tools in sensitive areas (spatial bans put in place for several purposes) that are in addition to existing CFP measures. - The programme covers stocks managed at the national level as well as aspects that relate to age/size structure of species. - The programme has been linked to a regional fisheries management organisation: General Fisheries Commission for the Mediterranean (GFCM). - It also includes awareness raising and educational measures that complement direct measures.
Weaknesses	- None (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a grounded justification, detailed below).
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme addresses nutrient inputs from aquaculture, agriculture, urban activities (including municipal waste water discharge), shipping, industry and recreational boating activities. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment, which will be finalised in May 2018.
Weaknesses	- The programme does not address atmospheric deposition of nutrients from sea-based and land-based sources.
D7 — Hydrographical changes	
Strengths	- The programme of measures addresses hydrographical changes. The Member State refers to existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes such as land claim and coastal defence, port operations, industry and dredging (as well as desalination/water abstraction to some extent).
Weaknesses	- It is not clear if the Malta's programme addresses 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	- The programme addresses the introduction of contaminants through measures that target industrial and urban activities, as well as desalination

	<p>and aquaculture.</p> <ul style="list-style-type: none"> - It addresses accidental pollution by tackling industry, port operation and shipping. - Malta's programme addresses contaminant inputs to the sea from land-based (e.g. industry, agriculture, urban areas) and sea-based sources (e.g. marine hydrocarbon extraction, shipping, aquaculture, dredging). - It includes dedicated measures on contaminants in seafood (D9).
Weaknesses	<ul style="list-style-type: none"> - The programme addresses atmospheric deposition of contaminants through an indirect measure (investigations about the potential contribution of contaminants to coastal waters by atmospheric deposition). - It is not clear whether biological effects by contaminants are covered by the measures. - The programme 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 addresses marine litter by covering fisheries, tourism/recreational activities and shipping. - It addresses both the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. - The programme specifically covers macro-litter.
Weaknesses	<ul style="list-style-type: none"> - Malta's programme does not specifically cover microplastics (Malta reports that no information is yet available in relation to microplastics).
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses impulsive noise through measures that cover marine hydrocarbon extraction. - It mentions that the establishment of a noise register for impulsive sound has been included as part of its MSFD monitoring actions, which will also contribute towards achievement of the D11 target. - The programme links to international organisations (Bonn Convention²¹ and ACCOBAMS).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address continuous noise from shipping. - It does not include research efforts which would aim to collect additional data and conduct studies to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with recommendation from TG Noise. - The programme does not address other energy inputs (such as heat or light). - It does not refer to IMO Guidelines on underwater noise.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), light disturbance and noise. Various activities such as fisheries, activities attracting predators (rats) or shipping are covered. - It covers bird habitats and their breeding sites.
Weaknesses	<ul style="list-style-type: none"> - Malta's programme does not address the effect of non-indigenous species, contaminants and marine litter on seabirds. It may be that these are somewhat addressed by non-indigenous species (D2), contaminants (D8)

²¹ The Convention on Migratory Species.

	and marine litter (D2) measures, but how the programme will contribute to addressing these pressures on birds (D1, 4) specifically cannot be assessed based on the information reported.
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) from fisheries. - The measures addresses contaminants and changes in hydrographical processes through the D8 and D7 measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include spatial protection measures for fish and cephalopods (D1, 4). While bans for specific fishing tools in sensitive areas have been included under D3 and could have impacts on fish (D1, 4) the Member State did not make the link. - Even though the programme complements commercial fish and shellfish (D3) measures with additional measures, more measures aiming to also protect non-commercial species and functional fish habitats are missing to achieve GES. - It is not clear whether the programme includes specific measures or plans for cephalopod species. - The programme provides little information on where and how fish species present within the Member State’s territorial waters are protected. - The programme does not address the effect of non-indigenous species, marine litter and underwater noise on fish. It may be that these are somewhat addressed by non-indigenous species (D2), marine litter (D10) and underwater noise (D11) measures, but how it will contribute to addressing these pressures on fish (D1, 4) specifically cannot be assessed based on the information reported.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) from fisheries, collision with vessels (due to shipping) and underwater noise from seismic and sonar surveys. - It addresses impact on mammal habitats due to tourism. - The programme includes spatial protection measures to address various impacts on mammal and reptile habitats and populations.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address impacts of underwater noise on mammals due to shipping. - It does not address the effect of contaminants and marine litter on marine mammals. It may be that these are somewhat addressed by contaminants (D8) and marine litter (D10) measures, but how the programme will contribute to addressing these pressures on mammals (D1, 4) specifically cannot be assessed based on the information reported.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses eutrophication on water column habitats from various human activities such as agriculture, urban, shipping, industry and tourism.
Weaknesses	<ul style="list-style-type: none"> - The water column, although considered in other descriptors, is mainly covered by the Member State in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is referenced in the water column habitats GES and targets definitions but not

	<p>enough in the programme. Additionally, the water column is a key transfer route for the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to foodwebs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.</p>
<p>D1, 4, 6 — Seabed habitats</p>	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical loss from port operations and offshore structures. - Its measures address physical damage from fisheries, dredging and tourism/recreational activities (including yachting).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address physical damage from industry and urban activities. They are likely to be covered by measures defined under other descriptors, however, the link about how these measures would affect seabed habitats is not clearly made. - Even though the programme of measures covers destructive fishing practices (trawling), their impacts are primarily addressed in MPAs and deep sea but not in Malta's entire waters. Therefore, impacts from fisheries are covered only in certain areas and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - The programme does not make links to other descriptors such as non-indigenous species (D2), contaminants (D8) and marine litter (D10).
<p>Exceptions</p>	
<p>Malta 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') in its territorial waters. Malta states that, while it can take measures to prevent the introduction of non-indigenous species into Maltese waters from anthropogenic activity, it is not responsible for the management of the marine areas at the entry point of non-indigenous species from the Suez Canal into the Mediterranean region. Malta cannot take measures to control the secondary dispersal of species introduced through the Suez Canal into the Mediterranean, which may compromise the achievement of GES in Maltese waters. This justification is found to be grounded.</p>	
<p>The Member State 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') within its exclusive economic zone. Malta points to the exploitation of shared commercial stocks so as to ensure maximum sustainable yield. It states that while its existing and new measures are adequate to achieve environmental targets and contribute to the achievement of GES within its waters, the achievement of regional GES does not depend on Malta's efforts alone but requires efforts at a regional scale by both EU and third countries.</p> <p>This exception is found to be grounded. The measures reported by Malta include a long-term strategy to improving fisheries management and governance in the region, including by both EU Member States and third countries, which will address issues reported under this exception.</p>	
<p>Malta applies an exception for Contaminants in seafood (D9). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible') for the entire exclusive economic zone. The exception is applied for contaminants exceeding regulatory levels in retail samples of pelagic fish. Malta justifies the application of this exception by</p>	

stating that the concentrations in seafood are not only impacted by contamination from Maltese sources, but also by regional sources, and its own measures alone might not be sufficient to avoid harmful contaminant levels in seafood. In detailing its gap analysis, Malta refers to occasional high levels of mercury in seafood and it is likely that this exception applies to levels of this contaminant. This exception is found to be grounded.

The Member State 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') in its territorial waters. The exception concerns levels of litter, in particular microlitter, in the marine environment. Malta justifies the application of the exception by pointing to the transboundary nature of marine litter, stating that actions by other Mediterranean countries may interfere with Malta's efforts to reduce marine litter in line with achieving GES. Nevertheless, Malta does not report on what basis it applies this exception, for example if it has identified reasonable amounts of litter originating from neighbouring Member States through monitoring. The Member State also does not report by when it expects GES to be achieved alternatively. Hence, this exception is found to be partially grounded.

Recommendations for Malta to consider in its programme of measures:

General

- In general, Malta should better address certain pressures and activities in its programmes of measures. These are specified in the descriptor specific recommendations below.
- GES and targets definitions should be better addressed for contaminants (D8), underwater noise and energy (D11), fish (D1, 4) and seabed habitats (D1, 4, 6).
- The Member State should strive to determine the timelines for achieving GES (relevant for hydrographical changes (D7), underwater noise and energy (D11), birds, fish, mammals (D1, 4) and seabed habitats (D1, 4, 6)) and, where there are delays beyond 2020, to report exceptions provided these are adequately justified (relevant for marine litter (D10)).
- The Member State should provide GES definitions for water column habitats (D1, 4).
- The Member State's programme should establish more links with existing EU policies and international instruments for eutrophication (D5), hydrographical changes (D7), contaminants (D8) and underwater noise (D11).
- The Member State should clearly explain whether the programme will be timely implemented (new measures in place after 2016).
- Malta should provide more information about its measures (especially the existing ones) to understand how they will contribute to progress towards targets and GES (as defined by the Member State).
- The Member State should quantify the pressures present in its waters and their expected level of 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.
- Malta should make better links between the groups of 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.
- It should ensure better linkages between its programme 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.

<ul style="list-style-type: none"> - 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.
<p>D5 — Eutrophication</p>
<ul style="list-style-type: none"> - Malta should establish measures to address atmospheric deposition of nutrients from sea-based and land-based sources.
<p>D7 — Hydrographical changes</p>
<ul style="list-style-type: none"> - Malta’s programme should address cumulative impacts. - It should utilise synergies with MSP for addressing cumulative impacts for D7.
<p>D8/D9 — Contaminants and contaminants in seafood</p>
<ul style="list-style-type: none"> - The Member State should establish direct measures on atmospheric deposition of contaminants. - It should clearly explain if and how measures cover the biological effects of contaminants. - The programme should better explain the manner in which the contaminants (D8) measures contribute to contaminants in seafood D9 targets.
<p>D10 — Marine litter</p>
<ul style="list-style-type: none"> - The Member State should address micro-litter better, through direct measures, in addition to indirect measures, in accordance with recommendations of TG Litter. - It should make efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
<p>D11 — Underwater noise and energy</p>
<ul style="list-style-type: none"> - The Member State should establish measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. shipping). - Malta should make more efforts to address data gaps and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable to then define more practical and direct measures to address underwater noise in the second MSFD implementation cycle. - The Member State should establish measures that address additional aspects of this descriptor, such as heat and light.
<p>D1, 4 — Birds</p>
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to address pressures on birds beyond by-catch. Measures could target the effects of non-indigenous species, 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.
<p>D1, 4 — Fish and cephalopods</p>
<ul style="list-style-type: none"> - Malta should establish spatial protection measures for fish and cephalopods. - It should establish additional measures aiming to protect non-commercial species and functional fish habitats. - The Member State should clearly indicate whether it developed measures for cephalopods. - It should provide better information on the level of protection provided for fish (commercial and non-commercial), in relation to where fish species occur within the Member State’s territorial waters, and how they are protected. - Malta should consider establishing additional measures to address pressures on fish beyond by-catch. Measures could target the effects of non-indigenous species, 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 fish should be explained.
<p>D1, 4 — Mammals</p>

- The Member State should consider establishing additional measures to address relevant pressures on mammals beyond by-catch (e.g. underwater noise due to shipping, 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 mammals should be explained.

D1, 4 — Water column habitats

- The Member State should more clearly indicate which measures reported under other descriptors address pressures for water column habitats (and plankton).

D1, 4, 6 — Seabed habitats

- The Member State should establish measures addressing physical damage from industry and urban activities. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on seabed habitats should be explained.

- It should establish measures covering destructive fishing practices (trawling) beyond MPAs and deep sea areas.

- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2, D8, D10), the Malta should explain the expected effect that measures have on seabed habitats.

Exceptions

- The Member State should provide more robust justifications for its exceptions, when these are assessed as partially grounded (marine litter (D10)).

12. The Netherlands

General conclusions on the Netherlands' programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for almost all descriptors. - The Member state considers that GES will be achieved by 2020 for marine litter (D10) and underwater noise and energy (D11). - The Member State considers that GES is already achieved for hydrographical changes (D7) and contaminants in seafood (D9). - The Member State has brought together and coordinated existing national measures and processes (related to the implementation of EU legal acts and regulations, as well as regional commitments to protect the marine environment more efficiently), and also established new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - The programme includes measures that are based on commitments to existing European, regional and international policies, such as the Birds and Habitats Directives (D1, 4, 6, D2, D7, D11), Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (D1, 4, 6, D3), the Nitrates Directive (D5), the Water Framework Directive (WFD; D1, 4, 6, D5, D7, D8), the Urban Wastewater Treatment Directive (UWWTD; D5), the Industrial Emissions Directive (IED) (D8), Regulation (EC) No 1881/2006 on setting maximum levels for certain contaminants in foodstuffs (D9), the Port Reception Facilities Directive (D10), the Environmental Impact Assessment (EIA) Directive (D1, 4, 6, D7), the Waste Framework Directive (D10), the OSPAR (D1, 4, 6, D2, D8, D10, D11) and the Ballast Water conventions (D2, D8) as well as IMO-MARPOL (D2, D5, D8, D10) and IMO — Guidelines on underwater noise (D11). - It includes both existing, and new measures that complement those already in place that specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures (including MPAs). These measures address more than one descriptor at a time and therefore contribute towards GES and targets for several descriptors. Measures especially include the strengthening of MPA networks and the establishment of management measures. - It combines direct and indirect measures. Most measures directly address pressures on the marine environment. Indirect measures complement the direct ones, through governance and coordination actions, as well as awareness raising efforts. - Based on the information reported by the Netherlands on cost and resource allocations, as well as the responsible bodies for implementation, the measures are likely to be implemented in the future and will thus contribute to achieving GES by 2020. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D11), the Member State reports research

	<p>efforts. This will allow addressing knowledge gaps but also to build upon the results to design measures, which will contribute directly to tackling the pressures in the MSFD's second implementation cycle.</p> <ul style="list-style-type: none"> - The spatial scope of the measures is specified consistently across the programme of measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not fully address GES and targets for water column habitats (D1, 4) for which no targets are defined. - The Member State considers that GES will not be achieved by 2020 for biodiversity (D1, 4, 6), commercial fish and shellfish (D3), eutrophication (D5) and contaminants (D8). - In its programme of measures, the Netherlands does not provide a timeline for the achievement of GES for non-indigenous species (D2). - Exceptions are applied for eutrophication (D5) and contaminants (D8), but not for the other descriptors for which doubts about achieving GES by 2020 are raised. Not enough justifications are provided for the reasons why GES will not be achieved by 2020 for commercial fish and shellfish (D3), and the biodiversity descriptors (D1, 4, 6). - In some cases, the programme does not include sufficient links to existing European policies and international instruments. It is especially the case for eutrophication (D5), hydrographical changes (D7) and contaminants (D8). - 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. - It includes spatial measures whose exact geographical coverage was not clear at the time of reporting. Therefore, it is not possible to provide a clear and specific assessment on the management efforts in place (or to be implemented in the future). - The Netherlands does not report a timeline for the implementation of its measures (due to national or international processes, implementation of some measures may be delayed, but all measures are expected to contribute to progress towards GES by 2020).
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species by tackling aquaculture and shipping via ballast water management (link to the BWMC) and anti-fouling measures.
Weaknesses	<ul style="list-style-type: none"> - It is unclear whether the measures cover recreational vessels. - The programme does not include early warning systems of non-indigenous species introductions as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by covering fisheries (commercial fishing). - It includes seasonal and spatial fishing bans (for several purposes including stock management and biodiversity conservation) that are in addition to existing CFP measures. - The measures cover stocks managed at the national level, non-targeted species as well as age/size structure
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether recreational fishing is addressed (although reported in

	Article 8 by the Member State and the neighbouring countries).
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme addresses nutrient enrichment from agriculture, urban, industry and shipping sources. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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 (NO_x).
Weaknesses	None (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a partially grounded justification, detailed below).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses the interference with hydrological processes from various activities, though these are nevertheless not specified. - It includes a single existing measure for D7, which stems from other legal acts. As such, all new projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - The programme utilises synergies with the EIA and SEA Directives, as well as with the WFD.
Weaknesses	- 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 the Netherlands.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants from land-based sources (i.e. industry, agriculture, urban activities, recreation/tourism) and sea-based sources (i.e. shipping, marine hydrocarbon extraction), as well as the effect of contaminants on biodiversity. - It addresses accidental pollution from shipping and marine hydrocarbon extraction. - The programme addresses atmospheric deposition of contaminants.
Weaknesses	- 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 addresses marine litter by covering land-based (e.g. industry, tourism) and sea-based (e.g. fisheries, shipping) sources of litter. - It 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 covers both macro and micro-litter (focused on industry, namely cosmetics).
Weaknesses	- None identified.

D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses underwater noise from marine-based renewable energy generation, shipping, marine hydrocarbon extraction and other, not detailed, activities. - It addresses other energy inputs (light).
Weaknesses	<ul style="list-style-type: none"> - None identified.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch) from fisheries. - It addresses impacts on breeding and refuge areas and biological disturbance caused by various activities (e.g. land claim, dredging, sand extraction, civil aviation, maintenance of cables and pipelines).
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how the effects of non-indigenous species and marine litter on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch) from fisheries, and the extraction of species affecting migratory fish. - The measures address biological disturbances from various activities. - It includes spatial protection measures to complement commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats.
Weaknesses	<ul style="list-style-type: none"> - None (except the fact that GES will not be achieved by 2020, mentioned above).
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch), and biological disturbances. Various activities such as fisheries and dredging are covered.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how contaminants and marine litter on mammals is addressed. It is possible that these pressures are addressed by the groups of measures reported for 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 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme includes measures that are relevant to water column habitats (spatial protection measures and measures aiming at improving seabed habitat condition and reduce waste water runoff) although they are not specific to this habitat.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses pressures on water column habitats, as no specific water column habitat measure have been reported and the Member State does not clearly identify how measures reported under other descriptors (e.g., D2, D5, D8) will address relevant pressures on this habitat. - The water column, although considered in other descriptors, is mainly covered by the Member State 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical damage caused from fisheries, dredging, maintenance of cables and pipelines. - It addresses physical loss caused from dredging, land claim, sand and gravel extraction and coastal defence. - Measures address biological disturbance from various activities such as recreation or fishing, among others. - It includes measures that target destructive fishing practices particularly in MPAs but also outside spatially protected areas.
Weaknesses	<ul style="list-style-type: none"> - The programme mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - Most measures relate to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species, eutrophication and marine litter.
Exceptions	
<p>The Netherlands applies an exception for eutrophication (D5). It applies Article 14(4) ('No significant risks and disproportionality of costs'), Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible') and Article 14(1)(b) ('natural causes'). The exception includes several aspects, such as nitrogen during high-volume river discharges (due to climate change), sediment as a source of phosphorus, and nutrient emissions from upstream countries affecting their rivers and eventually marine waters. Furthermore, the Member State reports that there are limited eutrophication effects in its marine waters, yet OSPAR's reports contradict this last statement.</p> <p>This assessment finds that the justifications provided are partially grounded, as even though natural and transboundary effects reduce the likelihood of achieving GES for D5 for the Netherlands and the costs to remove historically contaminated sediments are high, the risk of eutrophication in the Dutch North Sea is important (according to OSPAR). Furthermore, no ad-hoc measures appear to have been reported in relation to Article 14(1)(b) ('natural causes') as per MSFD requirements.</p>	
<p>The Netherlands 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 exception states that the reported measures represent the maximum effort that can be made to achieve GES for D8. However, there are no technical measures that could prevent the presence of hazardous substances in the Dutch part of the North Sea and, because of the natural conditions, the situation cannot improve quickly enough.</p> <p>This assessment finds that the justification of the exception provided is partially grounded. Historical contamination of the North Sea is an issue, but natural conditions represent part of</p>	

the reason why the achievement of GES will be delayed beyond 2020. It should be noted that the Member State does not specify when GES is expected to be achieved as per MSFD requirements (in relation to Article 14(1)(e)).

Recommendations for the Netherlands to consider in its programme of measures:

General

- In general, the Netherlands should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below.
- It should establish additional measures to fully address GES definition for water column habitats (D1, 4) and define targets for this descriptor.
- The Member State should strive to determine the timelines for achieving GES (relevant for non-indigenous species (D2)) and, where there are delays beyond 2020, to report exceptions provided these are adequately justified (relevant for biodiversity (D1, 4, 6) and commercial fish and shellfish (D3)). Furthermore, if GES is not expected to be achieved by 2020, then the Member State should estimate the alternative dates by when GES will be achieved (relevant to D5 and D8).
- The programme of the Netherlands should establish more links with existing EU policies and international instruments for eutrophication (D5), hydrographical changes (D7) and contaminants (D8).
- The Member State should quantify the pressures present in its waters and their expected level of 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.
- It should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs and the policies and measures that will be in place within these areas).
- The programme should indicate a timeline for the implementation of the measures (especially for biodiversity (D1, 4, 6), non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), marine litter (D10) and underwater noise and energy (D11)).
- The Netherlands should develop more research efforts to fill knowledge gaps and provide an assessment on when GES will be achieved.
- The Member State should ensure coherence of its determinations of GES, environmental targets and the programme of measures. This would allow to use environmental targets systematically as milestones towards achieving GES through the measures, and monitor this progress through the MSFD monitoring programmes. This is applicable mainly to birds, mammals, fish, water column habitats and seabed habitats (D1, 4, 6).

D2 — Non-indigenous species

- The Member State should specify whether its measures cover recreational activities.
- It should consider developing non-indigenous species early warning systems and registries as part of their measures.

D3 — Commercial fish and shellfish

- The Member State should cover recreational fishing activities (if relevant).

D7 — Hydrographical changes

<ul style="list-style-type: none"> - The Netherlands should address cumulative impacts on habitats by multiple stressors. - It should utilise synergies with MSP for addressing 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.
D8/D9 — Contaminants and contaminants in seafood
<ul style="list-style-type: none"> - The Member State should better explain the manner in which the D8 measures contribute to D9 targets.
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should make efforts to identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.).
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should specify how pressures on birds beyond by-catch are addressed (or will be addressed), namely the effects of non-indigenous species and ingestion of litter.
D1, 4 — Mammals
<ul style="list-style-type: none"> - The Netherlands should specify how pressures on mammals beyond by-catch are addressed (or will be addressed), namely the contaminants and litter.
D1, 4 — Water column habitats
<ul style="list-style-type: none"> - The Member State should more clearly indicate which measures reported under other descriptors address pressures for water column habitats (and plankton), and elaborate on how GES and targets for water column habitats are expected to be achieved.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none"> - The Netherlands should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - It should more clearly indicate which measures reported under other descriptors (such as non-indigenous species (D2), eutrophication (D5) and marine litter (D10)) address pressures for seabed habitats, and further elaborate on how GES and targets for seabed habitats are expected to be achieved.
Exceptions
<p>The Member State should provide more robust justifications for its exceptions, when these are assessed as partially grounded (relevant for D5 and D8). It should also report ad-hoc measures in relation to Article 14(1)(b) and specify when it expects GES to be achieved in relation to Article 14(1)(e).</p>

13. Poland

General conclusions on the Polans's programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Poland's programme of measures addresses GES and targets for non-indigenous species (D2), contaminants (D8), contaminants in seafood (D9), birds, fish (D1, 4) and seabed habitats (D1, 4, 6). - The Member State reports that GES will be achieved by 2020 for birds (D1, 4). - The programme includes measures that are based on commitments to existing European policies as well as regional and international agreements, such as the Birds and Habitats Directives (D1, 4, 6), Regulation (EU) No 1143/2014 (D2), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the Nitrate Directive (D5), the Water Framework Directive (WFD; D5, D8), Urban Wastewater Treatment Directive (UWWTD; D5), the National Emission Ceiling Directive (D5, D8), the Industrial Emissions Directive (D5, D8), the EIA Directive (D7), the Maritime Spatial Planning Directive (all descriptors), Regulation (EC) No 782/2003 on the prohibition of organotin compounds of ships (D8) 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) or the IMO-Ballast Water Management Convention (D2) and regional actions such as HELCOM action plan on marine litter (D10) or the HELCOM Baltic Sea action plan (all descriptors); among many others. - It includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures. These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors, through the strengthening of MPA networks and the establishment of management measures within MPAs. - It 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 efforts. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. all descriptors), 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 partially addresses GES and targets for commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), marine litter (D10), underwater noise and energy (D11), mammals and water column habitats (D1, 4). - It does not report any timeline for achieving GES for commercial fish and shellfish (D3), hydrographical changes (D7), contaminants in seafood (D9),

	<p>marine litter (D10), underwater noise and energy (D11) and water column habitats (D1, 4). This may jeopardise the ability of Member States to determine progress toward achieving GES by 2020.</p> <ul style="list-style-type: none"> - The Member State reports that GES will not be achieved by 2020 for non-indigenous species (D2), eutrophication (D5), contaminants (D8), fish, mammals (D1, 4) and seabed habitats (D1, 4, 6). Exceptions are applied, the justifications of which are either grounded, partially grounded or not grounded (please see section below on exceptions). - In rare cases, the programme does not include sufficient links to existing European policies as well as international instruments. It is the case for the biodiversity descriptors, hydrographical changes (D7) and underwater noise (D11). - 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 likelihood of implementation is moderate. Timelines are not consistently provided. - The Member State does not always provide sufficient details about the measures to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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 representation of species and habitats within the MPAs, the size, number, and location of MPAs and the conservation objectives of the MPAs. - 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 scope of the measures is only specified for the new measures (not for the existing ones). It is therefore not clear whether all waters are covered. - The programme sometimes includes data collection efforts, as measures.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses introductions of non-indigenous species through aquaculture and shipping (ballast water and anti-fouling). - It includes early warning systems for introductions of non-indigenous species as measures. - The programme covers recreational activities.
Weaknesses	<ul style="list-style-type: none"> - None (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a grounded justification, detailed below).
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial and recreational fishing. - It proposes seasonal and 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.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the extraction of species from 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 addresses nutrient enrichment from agriculture, urban activities, industry, aquaculture and shipping. - It draws from the Member State’s WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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 (NOx) from sea-based (link to IMO-MARPOL) and land-based sources (link to the IED and NEC Directives).
Weaknesses	<ul style="list-style-type: none"> - The programme does not address nutrient enrichment from solid waste disposal and fishing (which were both reported as relevant by the Member State in its Article 8).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes.
Weaknesses	<ul style="list-style-type: none"> - The measures does not clearly address waste disposal, shipping and tourism (identified by Poland as relevant in its Article 8 report). - The programme does not address cumulative impacts, i.e. impacts from different/multiple human activities/projects 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. - It does not make a clear link to SEA procedures.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction contaminants from industry, urban activities, agriculture, fisheries, shipping. The measures also cover accidental pollution (mainly due to shipping). - It addresses atmospheric deposition of contaminants (link to Industrial Emissions Directive and the National Emission Ceiling Directive). - The programme includes specific measures for contaminants in seafood (D9). - It also explains how measures for contaminants (D8) will contribute to addressing pressures for contaminants in seafood (D9) and allow progress towards GES and targets for this descriptor.
Weaknesses	<ul style="list-style-type: none"> - None (except the fact that GES for D8 will not be achieved by 2020, mentioned above, which is explained by a grounded justification, detailed below, and no timeline is provided for D9, also highlighted above).
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter by covering shipping, fisheries, ports, urban areas, agriculture and tourism/recreational activities. - It 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 specifically covers macro-litter with measures targeting litter

	<p>removal.</p> <ul style="list-style-type: none"> - It includes efforts to address knowledge gaps for micro-litter, which, while not yet fully addressing the problem, will positively contribute to better characterising the pressure and its potential impact on fauna.
Weaknesses	<ul style="list-style-type: none"> - The programme does not yet fully address micro-litter, referring to knowledge gaps which the indirect measures will address.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses underwater noise caused by shipping and port operations. - It includes efforts to address knowledge gaps for underwater noise.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address underwater noise from marine-based renewable energy, fisheries. - It is not clear whether the programme addresses other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses accidental by-catch and other pressures on bird species and habitats, such as oil pollution, through fisheries and shipping management measures.
Weaknesses	<ul style="list-style-type: none"> - It does not explain how the effects of non-indigenous species, marine litter as well as light pollution on seabirds are addressed, and does not cover birds' food sources. It is possible that these are addressed by the groups of measures for non-indigenous species (D2), marine litter (D10) and underwater noise and energy (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 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme addresses accidental by-catch and other pressures on fish species and habitats through fisheries management measures. - It includes spatial protection measures to complement commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats.
Weaknesses	<ul style="list-style-type: none"> - None (except the fact that GES will not be achieved by 2020, mentioned above, which is explained by a partially grounded justification).
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - Poland's programme addresses by-catch due to fisheries, oil pollution due to shipping and other impacts on marine mammals (biological disturbance) such as habitat loss.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how impacts from underwater noise and marine litter on mammals are addressed. It is possible that these pressures are addressed by the groups of measures reported for 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 addresses contaminants and eutrophication as well as other pressures on water column habitats (no human activity has been specified).
Weaknesses	<ul style="list-style-type: none"> - The programme does not include dedicated measures addressing water column habitats. It is possible that pressures on water column habitats are

	<p>addressed via measures reported for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10); but how the programme will contribute to addressing pressures on water column habitats (D1, 4) specifically cannot be determined based on the information reported.</p> <ul style="list-style-type: none"> - 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme addresses physical loss and physical damage caused by bottom-trawl fishing, marine renewable energy and dumping of sediments; as well as pollution from urban waste water. - It includes existing measures that target destructive fishing practices (trawling).
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme of measures covers recreational activities. - Spatial protection measures are often lacking in detail on their area coverage, temporal ranges of restrictions. - Other pressures such as eutrophication (D5) and marine litter (D10) have not been considered. It is possible that pressures on seabed habitats are addressed via measures reported for eutrophication (D5) and marine litter (D10); but how the programme will contribute to addressing pressures on seabed habitats (D1, 4, 6) specifically cannot be determined based on the information reported.
Exceptions	
<p>Poland 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'). Poland reports that the likelihood of achieving GES for D2 by 2020 is low, and it applies an exception. The justification provided for the application of the exception is that the introductions of non-indigenous species are from transboundary sources, with specific reference to non-indigenous species being introduced from bordering waters that are outside of EU control.</p> <p>The provided justification is grounded as indeed it is likely that already introduced non-indigenous species in the Baltic Sea could spread into Polish marine waters and it is very difficult to control this spread once these species have entered the marine environment. Furthermore, the Member State has defined relevant new measures to address non-indigenous species introduction from national sources.</p>	
<p>Poland applies an exception for eutrophication (D5). 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'). Poland applies this exception for 'most of environmental targets related to D5', which covers all of its marine waters. Poland states that it will take decades for the ecosystem to start recovering, considering that water residence time in the Baltic is approximately 20 years and that internal loading will continue to play a significant role even after external</p>	

loading is curbed. This mainly relates Article 14(1)(e).

This assessment finds the justification provided for not reaching GES for D5 by 2020 is grounded. 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 reduced, which would indeed influence GES being achieved.

The Member State 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 exception is applied for only one marine area (area 62) where the status is considered to be below GES. Poland clarified that the initial assessment for contaminants (D8) determined that GES has been achieved in all other marine areas, and that the new measures complement the existing ones and will contribute to the maintenance of GES. The justification is that some substances concerned have long decay periods and it is highly unlikely they will decompose or be absorbed into sediments fast enough to reach GES by 2020. At the same time Poland adds that loads and concentrations of contaminants have been generally decreasing in the past 20 years, although this downward trend is clearer in the case of heavy metals than in the case of particulate organic carbons.

This assessment finds the justifications provided by Poland to be grounded as indeed some contaminants (heavy metals, dioxins and particulate organic carbons) are persistent and take a long time to break down in the marine environment. Nevertheless, Poland does not provide a date of when GES is expected to be achieved as required by the MSFD (in relation to Article 14(1)(e)).

The Member State applies an exception for fish (D1, 4). It applies Article 14(1)(e) ('natural conditions which do not allow timely improvement in the status of the marine waters concerned'). Poland states that the LFI (Large Fish Indicator) is dependent on the size of cod, which is strongly correlated to climatic conditions of temperature and salinity. In order to fully assess this exception, Poland needs to provide more detail, such as evidence for changing trends in indicators linked to predictable changes in temperature and salinity. Based on the information provided it is not clear if the justification provided for the exception is based on assumptions or actual scientific analysis.

This assessment finds the provided justification is partially grounded. It is indeed true that temperature, salinity, climatic conditions can affect the LFI (linked here in particular to cod by Poland), however, this justification is not fully grounded. For the application of the exception the Member State should provide more detail, such as evidence for changing trends in indicators linked to predictable changes in temperature and salinity. Nevertheless, Poland does not provide a date of when GES is expected to be achieved as required by the MSFD (in relation to Article 14(1)(e)).

Poland applies an exception for mammals (D1, 4). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible'). Poland states that it cannot reduce by-catch levels of harbour porpoises effectively because such by-catch mainly occurs outside of its territory.

The justification of the exception is not found to be grounded. This assessment finds that this could be at least partially addressed through regional cooperation (either establishing regional cooperation or if there, enforcing it better). It could be though that by-catch rates are too high, and this may need to be addressed through more direct measures.

The Member State applies an exception for seabed habitats (D1, 4, 6). Poland does not specify which article it applies.

Firstly, it reports that benthic ecosystems and species are characterised by slow growth. Expected changes leading to improved ecosystems of the seabed can be a slow and long-term process and, consequently, targets linked to a recovery of species and expansion of habitat distribution, will not be achieved by 2020. The assessment finds that this justification is grounded.

Secondly, Poland reports that it has introduced a biotic index for seabed habitats (B) to complement the criteria of the WFD, as this index will reflect the abundance and species richness in the structure of benthic communities, in addition to their sensitivity to eutrophication depending on their location. Poland states two invasive non-indigenous species have significant impact on the indicator index B, one polychaete species (*Marenzelleria sp.*) and one bivalve species (*Mya arenaria*). These species spread easily and occur in abundance in some areas, which will inhibit the achievement of GES even after the implementation of new measures. Measures to control non-indigenous species have been reported by Poland under D2, furthermore seabed mapping is identified as a measure, which implies that further work is required to understand the distribution and quality of seabed habitats. This assessment finds that it is true that an increase in *Mya arenaria* density have been observed overall in the Baltic, which have been associated with increases in organic material. Furthermore, interspecific interactions occur in the Baltic, causing *Macoma balthica* to decrease in biomass in places where *M. arenaria* is abundant. *Marenzelleria spp.* are known to have invaded soft sediments across the Baltic and are considered to be causing significant impacts on ecosystem functioning. One issue is that Poland applies this exception to all seabed habitats without attempting to say which specific habitats are affected by these two species. The exception needs to be more specific. Therefore, this assessment finds the provided justification partially grounded.

Thirdly, in certain areas of the Baltic Sea, a regular decrease in oxygen occurs, which is regulated by occasional influx of water with high salinity and oxygen from areas of the Kattegat. Poland states that these conditions are natural and that the implementation of its conservation activities will not change or improve benthic habitats in these areas. If the oxygen levels are indeed natural, then there is nothing for the benthic habitats to recover from. However, the vast majority of oxygen depletion in the Baltic is considered to be due to nutrient enrichment (D5) with scientific papers showing the changes in extent of oxygen depletion over the past 100 years. Hence this justification is found to be not grounded.

Recommendations for Poland to consider in its programme of measures:

General

- In general, Poland should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below.
- GES and targets definitions should be better addressed for commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), marine litter (D10), underwater noise and energy (D11), mammals and water column habitats (D1, 4).
- The Member State should strive to determine the timelines for achieving GES for all descriptors, except birds (D1, 4) (the Member State reports that GES will be achieved by

2020).

- Poland's programme should establish more links with existing EU policies and international instruments for the biodiversity descriptors, hydrographical changes (D7) and underwater noise and energy (D11).
- The Member State should clearly identify the timelines for implementation for all new measures.
- It 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.
- Poland should quantify the pressures present in its waters and their expected level of 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 define the spatial scope of all its measures (both existing and new) 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 all marine waters.
- Poland 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.

D3 — Commercial fish and shellfish

- The Member State should address the extraction of species from seaweed and other sea-based food harvesting.

D5 — Eutrophication

- Poland's programme should establish measures to tackle nutrient enrichment from solid waste disposal and fishing.

D7 — Hydrographical changes

- Poland should establish measures to tackle hydrographical changes addressing waste disposal, shipping and tourism (identified as relevant by Poland in its Article 8 report).
- It should address cumulative impacts on habitats by multiple stressors.
- The Member State should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, shipping). In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.

D10 — Marine litter

- The programme should address micro-litter better, preferably through direct measures.
- Poland should establish additional research efforts to address data gaps, increase knowledge and pave the way for direct action.
- It should make 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 establish direct measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. marine-based renewable energy, fisheries). - It 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 and dedicated measures to address pressures on birds beyond by-catch. Measures could target effects of non-indigenous species, light pollution as well as litter ingestion. The measures should also cover 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 — Mammals
<ul style="list-style-type: none"> - The Member State should establish additional measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammal habitats due to shipping (collisions or underwater noise) or marine 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
<ul style="list-style-type: none"> - The Member State should establish dedicated measures to tackle the pressure associated with water column habitats. 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 cover plankton populations in its measures.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none"> - The Member State should establish measures covering all aspects of recreational activities (e.g. fishing, vessels mooring, diving). - The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - The Member State should establish measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats. - 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.
Exceptions
<p>The Member State should provide more robust justifications for its exceptions, when these are assessed as partially (fish (D1, 4) and seabed habitats (D1, 4, 6)) or not grounded (mammals (D1, 4)). It should also specify when it expects GES to be achieved in relation to Article 14(1)(e).</p>

14. Portugal

General conclusions on Portugal's programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Portugal's programme includes measures that are based on commitments to existing European policies, such as the Birds and Habitats Directives (D1, 4, 6), the Common Fisheries Policy (CFP; D3, D1, 4, 6), the Water Framework Directive (WFD; D5, D8, D1, 4, 6), the Maritime Spatial Planning Directive (D7), as well as international instruments such as the International Commission for the Conservation of Atlantic Tunas (ICCAT) (D3) and the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D8). - The programme of measures includes both existing and new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - It includes spatial protection measures. These measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures include the strengthening of MPA network, including the designation of new MPAs and the establishment of management measures within them. - 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 efforts. - Based on the information reported by Portugal on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the programme is likely to be implemented. Nevertheless, as most measures are in fact monitoring and research activities rather than environmental management and protection measures, it is not clear whether the programme supports the achievement of GES by 2020. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D2, D5, D7, D10, 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.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), contaminants (D8), contaminants in seafood (D9), marine litter (D10), underwater noise and energy (D11), birds, fish, mammals and water column habitats (D1, 4) as well as seabed habitats (D1, 4, 6). - The programme does not address GES and targets for hydrographical changes (D7). - The Member State does not report any timeline for achieving GES. - In some cases, the programme does not include sufficient links to existing European policies as well as international instruments. It is the case for D2, D5, D7, D8, D9, D10 and D11.

	<ul style="list-style-type: none"> - The Member State does not always provide sufficient details about the measures to understand how they will contribute to progress towards targets and GES (as defined by the Member State). - 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 representation of species and habitats within the MPAs, the size, number, and location of MPAs, the conservation objectives of the MPAs. - 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 scope of the measures is not specified (only the subdivision is reported). - 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 how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - The programme sometimes includes data collection efforts, as measures. - It over-relies on indirect measures without sufficiently addressing specific pressures on their marine environment (D2, D7, D10 and D1, 4, 6).
D2 — Non-indigenous species	
Strengths	- None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address introductions of non-indigenous species from shipping (ballast water and anti-fouling) and aquaculture (reported as relevant by Portugal in its Article 8 report). It is also unclear whether the measures address recreational vessels. - It includes an alert system for introductions of non-indigenous species as measures but only for the Azores.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species from commercial and recreational fishing. - It includes seasonal and/or spatial fishing bans (for several purposes, including; stock management, biodiversity conservation, and protection of over-exploited stocks) in addition to existing CFP measures. - The measures cover stocks managed at the national level.
Weaknesses	- It is not clear whether the programme covers aspects that relate to age/size structure of species and all relevant nationally managed stocks in all subdivisions.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme addresses nutrient inputs from agriculture, industry and urban areas. - It draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the

	extent to which the MSFD programme 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 partially addresses atmospheric deposition of nutrients (NO_x) from sea-based and land-based sources (for example, no link to IMO-MARPOL). - It does not consider additional aspects, such as improved aquaculture management practices.
D7 — Hydrographical changes	
Strengths	- None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address hydrographical changes. It is possible that hydrographical changes are addressed by the groups of measures reported for non-indigenous species (D2), eutrophication (D5) and contaminants (D8), but based on the information reported this cannot be determined. This does not allow for an understanding of how this descriptor will benefit from these measures. - For the Azores, one research effort is reported as relevant to hydrographical changes although this will not have direct effects on pressures. - The programme of measures 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 Portugal.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants through measures that target shipping. - It addresses contaminant inputs to the sea from sea-based (e.g. shipping, fisheries, dredging) and land-based sources (e.g. port operations, and potentially industry, urban areas, agriculture). - The programme is likely to address biological effects of contaminants.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address accidental pollution due to marine hydrocarbon extraction. - It does not address atmospheric deposition of contaminants. - While the programme includes dedicated measures for contaminants in seafood (D9), but half of them do not address the pressures directly. - The programme 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 addresses marine litter by covering fisheries, shipping, and port operations. - It specifically covers macro-litter through waste management on ships.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address marine litter from aquaculture, urban areas, tourism and recreational activities. - It is not clear whether 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.

	<ul style="list-style-type: none"> - It is also not clear whether the programme addresses micro-litter. - Although Portugal makes references to ‘degradation products’ in its GES and target definitions, no direct measures are in place to tackle this aspect. - Due to the lack of knowledge and reporting on the effects of marine litter on biota, it is unclear how the Member State will interpret the issue of ‘risk not being present on the coastal and marine environment’, although this aspect has been included in its GES definition.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme includes research efforts (targeting shipping and marine research) which aim to collect additional data and conduct studies to better characterise the pressure of noise in line with recommendation from TG Noise.
Weaknesses	<ul style="list-style-type: none"> - The programme does not directly address continuous and impulsive noise. - It does not address other energy inputs (such as heat or light). - The programme does not refer to the EIA Directive and IMO’s Guidelines on underwater noise.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses pressures on bird habitats in all subdivisions (from non-specified sources).
Weaknesses	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) from fisheries but only in the continental subdivision (not in the Azores and Madeira). - It does not address the effects of non-indigenous species and marine litter on seabirds, and does not cover birds’ food sources. It is possible that these pressures are addressed by the groups of measures reported 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 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) from fisheries in all subdivisions. - It includes spatial protection measures to complement commercial fish and shellfish (D3) measures reported also as relevant to fish biodiversity (D1, 4).
Weaknesses	<ul style="list-style-type: none"> - It is not clear to what extent non-commercial species and functional fish habitats are protected. - The programme does not include specific measures or plans for cephalopod species (for relevant waters). - It provides little information on where and how fish and cephalopod species present within the Member State’s territorial waters are protected.
D1, 4 — Mammals and reptiles	
Strengths	<ul style="list-style-type: none"> - The programme addresses selective extraction of species (incl. accidental by-catch) from fisheries in all subdivisions. - It includes spatial protection measures to develop the network of MPAs and create new ones for cetaceans.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address contaminants and impacts on mammals due to shipping (collisions), and underwater noise. - It does not appear to include measures addressing ingestion and entanglement from marine litter. It is possible that these pressures are addressed by the

	<p>groups of measures reported for 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.</p> <ul style="list-style-type: none"> - The programme of measures does not cover marine reptiles.
D1, 4 — Water column habitats	
Strengths	- None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses pressures on water column habitats, as no specific water column habitat measure has been reported. It possible that pressures on water column habitats are addressed by measures reported for non-indigenous species (D2), eutrophication (D5), hydrographical changes (D7), contaminants (D8) and marine litter (D10); but how it will contribute to addressing pressures on water column habitats (D1, 4) specifically cannot be determined based on the information reported. - Even though the programme includes measures that are relevant to water column habitat, they are spatial protection measures relevant for all descriptors. - The water column, although considered in other descriptors, is mainly covered by the Member State in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which referred to in the water column habitats GES and targets definitions but not in the programme of measures. Additionally, the water column is a key transfer route for the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	- The programme addresses pressures on seabed habitats through CFP measures that are relevant to commercial fish and shellfish (D3).
Weaknesses	<ul style="list-style-type: none"> - The programme does not directly address physical loss due to fisheries, marine mining, dredging, port operations, submarine cables, land claim and coastal defence; as well as physical damage from fisheries and dredging. Only measures with indirect effects (research and monitoring) have been reported. - It does not cover recreational activities that could still be destructive to seabed habitats (e.g., vessels mooring, recreational fishing). - The programme aims to address trawling through research efforts, which will not have direct effects on the pressure. - The programme includes spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas (except for research). - Other pressures such as non-indigenous species (D2), eutrophication (D5) and marine litter (D10) have minimal consideration in the programme. It may be that pressures on seabed habitats are addressed via measures reported for non-indigenous species (D2), eutrophication (D5) and marine litter (D10); but how the programme will contribute to addressing pressures on seabed habitats (D1, 4) specifically cannot be determined based on the information reported.

Recommendations for Portugal to consider in its programme of measures:

General
<ul style="list-style-type: none">- In general, Portugal should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below.- GES and targets definitions should be better addressed for all descriptors.- The Member State should strive to determine the timelines for achieving GES.- It should establish more links with existing EU policies and international instruments for non-indigenous species (D2), eutrophication (D5), hydrographical changes (D7), contaminants (D8), contaminant in seafood (D9), marine litter (D10) and underwater noise and energy (D11).- The Member State should provide more information about its measures and especially its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs).- Portugal should quantify the pressures present in its waters and their expected level of 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 define the spatial scope of its measures (both existing and new) in detail. Furthermore, the spatial scope of measures should be expanded to cover marine waters beyond coastal waters, where relevant pressures are present. Portugal should consider establishing additional measures beyond spatial protection efforts to address species and habitats. It is important that pressures are addressed across all marine waters.- The Member State should make better links between the groups of 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.- Portugal 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.- It 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 ensure a better balance in between direct and indirect measures when many indirect measures have been reported (relevant for D2, D7, D10 and D1, 4, 6).
D2 — Non-indigenous species
<ul style="list-style-type: none">- Portugal's programme should cover shipping (ballast water and anti-fouling, including for recreational vessels) and aquaculture.- The Member State should establish early warning systems for introductions of non-indigenous species as measures in all its subdivisions.
D3 — Commercial fish and shellfish
<ul style="list-style-type: none">- It should establish measures addressing clearly age/size structure of species as well as all relevant nationally managed stocks in all subdivisions.
D5 — Eutrophication
<ul style="list-style-type: none">- Portugal should establish measures that fully consider nutrient inputs from atmospheric deposition and that could be linked to IMO-MARPOL in relation to shipping (NOx

emissions). - It should establish more measures covering agriculture (beyond WFD and MSP).
D7 — Hydrographical changes
- The Member State should establish direct measures to tackle hydrographical changes in all subdivisions from relevant activities; or clearly report which measures reported for other descriptors contribute to addressing pressure, GES and targets for hydrographical changes (D7) and how. - The programme should establish measures to address cumulative impacts. - Portugal should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, shipping). 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
- The Member State should establish measures to address accidental pollution due to marine hydrocarbon extraction. - It should address atmospheric deposition (from sea-based and land-based sources) better. - The Member State should establish more direct measures for contaminants in seafood (D9). - Portugal should better explain the way the contaminants (D8) measures contribute to contaminants in seafood (D9) targets.
D10 — Marine litter
- The Member State should address marine litter, both in coastal areas and in the open sea, from aquaculture, urban areas, tourism and recreational activities, as well as the removal of existing litter. - It should address micro-litter better, preferably through direct measures, in addition to indirect measures, in accordance with recommendations of TG Litter. - The programme should establish measures that clearly address degradation products and ensure that litter does not present risk for the coastal and marine environment, as included in its GES and targets definitions. - Portugal should establish additional research efforts to address data gaps, increase knowledge and pave the way for direct action. - The Member State should make 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
- Portugal should establish direct measures to cover activities that are known to produce high levels of continuous and impulsive noise, as soon as possible (e.g. shipping for continuous noise). - It should consider establishing measures that target other energy inputs if possible (e.g., heat, light). - The Member State should make more efforts to address data gaps and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable to then define more concrete and direct measures to address underwater noise in the second MSFD implementation cycle.
D1, 4 — Birds
- Portugal should consider establishing additional measures to address by-catch of birds in all subdivisions and pressures on birds beyond by-catch. Measures could target disturbances on nesting sites by predation, effects of non-indigenous species, contaminants and litter ingestion, light and noise disturbances, 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

- The Member State should establish measures that extend beyond CFP efforts, and cover additional fish species, which are non-commercial species in open sea areas, and cephalopods, as well as functional fish habitats (including spatial protection measures).
- It should establish measures or plans for cephalopods species.
- The Member State should provide better information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial) and cephalopods, in relation to where fish and cephalopods species occur within the Member State's territorial waters, and how they are protected.

D1, 4 — Mammals and reptiles

- Portugal should establish additional measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammal habitats 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.
- It should establish measures targeting marine reptiles.

D1, 4 — Water column habitats

- The Member State should establish measures (including spatial protection measures but not only) to tackle the pressure associated with water column habitats (and plankton communities). 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.

D1, 4, 6 — Seabed habitats

- The Member State should establish measures covering fisheries (trawling), marine mining, dredging, port operations, submarine cables, land claim and coastal defence, that will have direct impacts on physical loss and damage.
- Portugal should establish measures covering all aspects of recreational activities (e.g., fishing, vessels mooring, diving).
- The Member State should establish measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats.
- It 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.

15. Sweden

General conclusions on Sweden's programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - Sweden's programme of measures addresses GES and targets for fish, mammals (D1, 4), eutrophication (D5), hydrological changes (D7), contaminants and contaminants in seafood (D8, D9), and marine litter (D10). - The Member State considers GES to be already achieved for hydrological changes (D7). - The programme includes measures that are based on commitments to existing national and European policies and legislation, as well as regional and international agreements, such as the Birds and Habitats Directives (D1.4.6), Regulation (EU) No 1143/2014 (D1, 4, 6, D2), Council Regulation (EC) No 708/2007 on non-indigenous species in aquaculture (D1, 4, 6, D2), the WFD (D2, D5, D7, D8, D10), Common Fisheries Policy (D1.4.6, D3), UWWTD (D5, D8/9), the Nitrates Directive (D5), the Industrial Emissions Directive (D5), the IMO-NECA (NOx Emission Control Area) (D5), the REACH regulation (D8/9), Regulation (EC) No 782/2003 on the prohibition of organotin compounds of ships (D8), the Regulation (EC) 1881/2006 on setting maximum levels for certain contaminants in foodstuffs (D9), the EIA Directive (D1.4.6; D7, D8/9), the SEA Directive (D7) and the Maritime Spatial Planning Directive (D1, 4, 6, D11), IMO-BWC (D2) OSPAR (D1.4.6; D2, D5, D7, D8/9, D10) and HELCOM (D1.4.6; D2, D3, D5, D7, D8/9, D10). - The Member State has brought together and coordinated existing national measures and processes (related to the implementation of EU legal acts and regulations, as well as regional commitments to protect the marine environment more efficiently), and also established new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D1, 4, 6; D2, D11), Sweden reports research efforts. This will allow addressing knowledge gaps but also to build upon the results to design measures, which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - Based on the information reported by Sweden on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high — most measures have secured funding and the timeline for implementing them is 2016 (with some being 2017-18, and just a few without implementation timeline). - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment, while simultaneously implementing measures complementing the direct measures through governance and coordination actions, as well as awareness raising efforts. - It includes spatial protection measures (including MPAs). Often, these

	<p>measures address more than one descriptor and therefore contribute towards GES and targets for several descriptors. Measures especially include the strengthening of MPA networks and the establishment of management measures within MPAs.</p> <ul style="list-style-type: none"> - The spatial scope of the measures is specified consistently across the programme.
Weaknesses	<ul style="list-style-type: none"> - The programme partially addresses GES and targets for birds and seabed habitats (D1, 4, 6), non-indigenous species (D2), commercial fish and shellfish (D3) and underwater noise and energy (D11). - The Member State reports that given the current level of knowledge gaps, it cannot report when GES will be achieved for biodiversity (D1, 4, 6), non-indigenous species (D2), commercial fish and shellfish (D3), marine litter (D10) and underwater noise and energy (D11). It acknowledges that there are risks of not achieving GES for these descriptors. - Sweden reports that GES will not be achieved by 2020 for eutrophication (D5), contaminants (D8) and contaminants in seafood (D9). Exceptions are applied for eutrophication (D5) and contaminants (D8), which are both found to be grounded (see below). - The Member State does not report any GES and targets definition for water column habitats (D1, 4). - In some cases, the programme does not include sufficient links to existing European policies and international instruments. It is especially the case for hydrographical changes (D7), contaminants (D8), marine litter (D10) and underwater noise (D11). - Some measures do not include timelines of implementation. - The programme includes spatial measures that 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 representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs and the policies and measures that will be in place within these areas. - 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 Member State often reports existing measures implementing existing legislation without providing details on actions that are/will be put in place. - Sweden's programme often refers to regional agreements without providing details on actions that are/will be put in place.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introductions of non-indigenous species by tackling aquaculture and shipping via ballast water management (link to the BWMC). - It includes early warning systems of non-indigenous species introductions as a measure. - Sweden plans to increase its monitoring and awareness-raising programmes to address knowledge gaps.
Weaknesses	<ul style="list-style-type: none"> - The programme does not cover non-indigenous species introduction due to

	<p>hull fouling in relation to shipping.</p> <ul style="list-style-type: none"> - It is unclear whether the programme covers recreational vessels.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species by tackling fisheries (including recreational fishing). - It includes measures on research and possible establishment of seasonal and spatial fishing bans (especially on coastal areas, for several purposes including stock management and biodiversity conservation), in addition to existing CFP measures.
Weaknesses	<ul style="list-style-type: none"> - It is unclear whether the programme covers age and size structure for CFP stocks.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme is likely to address nutrient enrichment from agriculture/forestry, urban activities and industry. - It is consistently based on the WFD. Measures for eutrophication draw from Sweden's River Basin Management Plan. 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme 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 does not clearly specify how atmospheric deposition of nutrients is addressed, although it reports an agreement for the establishment of NOx emission control areas (NECA), which would potentially cover this pressure.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme addresses interferences with hydrological processes. - It includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes. - The programme includes MSFD specific measures, in addition to WFD measures. - It utilises synergies with the EIA and SEA Directives, as well as with the WFD.
Weaknesses	<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 Sweden.
D8/D9 — Contaminants and contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of contaminants and accidental pollution through measures that target shipping, industry and urban activities. - It addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas), as well as sea-based sources (e.g. shipping), and the biological effects of contaminants.

	<ul style="list-style-type: none"> - The programme addresses atmospheric deposition of contaminants. - It contains measures that address contaminants in seafood (D9) via the D8 measures.
Weaknesses	<ul style="list-style-type: none"> - It is unclear if agriculture is addressed.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme addresses marine litter by covering land-based (e.g., industry, agriculture, urban areas) and sea-based (e.g. fisheries, shipping) sources of litter, as well as the removal of existing litter. - It also addresses micro-plastics from urban areas and industry. - The Member State reports measures that are linked with regional actions and coordinated by contracting parties of relevant Regional Sea Conventions. These mostly link to regional action plans for litter under OSPAR and HELCOM.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether tourism/recreational activities are directly addressed (however, measures on awareness raising and beach cleaning may indirectly cover them).
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme addresses continuous and impulsive underwater noise. Although no direct measure has been reported for any activity, several indirect measures cover marine-based renewable energy generation, shipping, fisheries, placement and operation of offshore structures, marine research and surveys. - The Member State reports research efforts which aim to collect additional data and conduct studies to better characterise the pressure of noise, and impact on fauna (mainly marine mammals), with a clear focus on shipping, including the development of a national noise register. - The programme includes one measure which has a direct effect on the pressure of underwater noise, while the others focus on addressing data and knowledge gaps.
Weaknesses	<ul style="list-style-type: none"> - In its programme Sweden has not established synergies with existing legal frameworks, such as the implementation of EIA procedures. - It does not address other energy inputs (e.g. heat and light).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (incl. by-catch), changes on hydrographical conditions, marine litter and micro-litter, and pressures on threatened bird species and habitats. Hunting, fisheries, urban areas, boat traffic and wind farms are covered. - It covers birds' food sources through measures targeting fisheries management (that should also protect birds' feeding grounds), especially in protected areas.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how the effects of non-indigenous species on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported for non-indigenous species (D2), 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	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (including by-catch),

	<p>changing hydrographical conditions, marine litter and micro-litter, non-indigenous species, nutrient enrichment and contamination. Various activities are covered, such as fisheries and aquaculture.</p> <ul style="list-style-type: none"> - Sweden complements commercial fish and shellfish (D3) measures with spatial protection measures aiming to also protect non-commercial species.
Weaknesses	<ul style="list-style-type: none"> - None (except the lack of timeline for the achievement of GES, mentioned above).
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme addresses the extraction of species (including by-catch), changing hydrographical conditions, marine litter and micro-litter, and pressures on threatened mammal species and habitats. Various activities are addressed, such as fisheries, boat traffic and hunting. - It includes spatial protection measures to address several horizontal pressures and protecting species such as the harbour porpoises.
Weaknesses	<ul style="list-style-type: none"> - The programme does not explain how contaminants and underwater noise on mammals is addressed. It is possible that these pressures are addressed by the groups of measures reported for contaminants (D8) and underwater noise and energy (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 addresses pressures on water column habitats (i.e. introduction of non-indigenous species, eutrophication, hydrographical changes and contamination) via measures reported for other Descriptors (namely D2, D5, D7 and D8).
Weaknesses	<ul style="list-style-type: none"> - The water column, although considered in other descriptors, is mainly covered by Sweden 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 the majority of non-seabed species and needs to be considered as part of the broader ecological coherence of the Member State's waters, within MPAs and in relation to food webs. The water column is often discounted from such measures due to a lack of scientific knowledge of these habitat types.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme is likely to address physical loss due to marine-based renewable energy generation, dredging, land claim/coastal defence, port operations and solid waste disposal, through MPA measures. - It addresses physical damage due to fisheries. - The programme addresses additional pressures such as the extraction of species (incl. by-catch) due to fisheries, non-indigenous species from aquaculture, changing hydrographical conditions, nutrient enrichment and contamination from various activities. - The Member State reports existing and new measures that target destructive fishing practices within and outside spatially protected areas.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address physical damage from shipping and tourism/recreational activities (although reported under Article 8 by Sweden).

	- It mainly includes fisheries restrictions within spatial protection measures, which are often lacking in detail on their area coverage, temporal ranges of restrictions and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas.
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Exceptions

Sweden has applied an exception for eutrophication (D5). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible'). Sweden states that even if the nutrient load targets are reached, recovery of the state of the marine environment will take a long time because the concentrations in marine waters can persist for a very long time. This assessment finds the justification to be grounded.

The Member State has applied an exception for contaminants (D8). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible'). Sweden states that inputs of contaminants from atmospheric deposition are transboundary in nature. Therefore, Sweden reports that a reduction of contaminant inputs through its measures will not be sufficient to achieve GES and that actions and inactions of neighbouring Member States will impact the achievement of GES. Additional justifications that relate to persistent contaminants from historical contamination are also mentioned, although these do not directly relate to Article 14(1)(a). This assessment finds the justification to be grounded.

Recommendations for Sweden to consider in its programme of measures:

General

- In general, Sweden should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below.
- GES and targets definitions should be better addressed for birds (D1, 4) and seabed habitats (D1.4.6), non-indigenous species (D2), commercial fish and shellfish (D3) and underwater noise and energy (D11).
- The Member State should develop more research efforts to fill knowledge gaps and provide an assessment on when GES will be achieved (especially for D1, 4, 6, D2, D3, D10, D11).
- It should define GES and targets definitions for water column habitats (D1, 4).
- The Member State should establish more links with existing EU policies and international instruments for hydrographical changes (D7), contaminants (D8), marine litter (D10) and underwater noise (D11).
- Sweden should report an implementation timeline for all measures.
- It should provide more information about its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs and the policies and measures that will be in place within these areas).
- The Member State should quantify the pressures present in its waters and their expected level of 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 programme should provide more details on actions put in place by existing measures and regional agreements. This will allow for a better understanding of how the Sweden's programme will support progress towards targets and GES for all descriptors.

<ul style="list-style-type: none"> - The Member State should ensure coherence of its determinations of GES, environmental targets and the programme of measures. This would allow to use environmental targets systematically as milestones towards achieving GES through the measures, and monitor this progress through the MSFD monitoring programmes. This is applicable mainly to birds, mammals, fish, water column habitats and seabed habitats (D1, 4, 6). - 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.
D2 — Non-indigenous species
<ul style="list-style-type: none"> - The Member State should address the introduction of non-indigenous species from shipping by covering hull fouling. - The Member State should clarify whether recreational vessels are covered by the measures.
D3 — Commercial fish and shellfish
<ul style="list-style-type: none"> - The Member State should clarify whether the programme addresses age and size structure of commercial species.
D5 — Eutrophication
<ul style="list-style-type: none"> - The Member State should clarify how atmospheric deposition of nutrients will be addressed (considering its agreement with the IMO for the designation of the Baltic and North Sea as NOx emission control areas (NECA)).
D7 — Hydrographical changes
<ul style="list-style-type: none"> - Sweden's programme should address cumulative impacts on habitats by multiple stressors. - The Member State should utilise synergies with MSP for addressing cumulative impacts. - It 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 clarify whether the programme addresses agriculture. If not, the Member State should establish measures to address contaminants from agriculture.
D10 — Marine litter
<ul style="list-style-type: none"> - Sweden should establish measures to address marine litter from tourism/recreation and that have a direct impact on the pressure. - It should establish research efforts to address data gaps, increase knowledge and pave the way for direct action to address degradation products as well as counter effects on marine species as specified in its GES and targets. - The Member State should make 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 establish synergies with relevant existing legal frameworks, such as the EIA procedures. - It 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 specify how pressures on birds beyond by-catch are addressed (or will be addressed), namely the effects of non-indigenous species.
D1, 4 — Mammals

- The Member State should specify how pressures on mammals beyond by-catch are addressed (or will be addressed), namely the effects of contaminants and underwater noise.

D1, 4 — Water column habitats

- The Member State should establish measures targeting plankton, key feature for water column habitats.

D1, 4, 6 — Seabed habitats

- Sweden should directly address shipping, tourism/recreational activities, dredging, marine-based renewable energy, port operations, land claim and solid waste disposal; since they have been identified as relevant pressures for seabed habitats.
- It should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.
- The Member State should more clearly indicate which measures reported under other descriptors address pressures for seabed habitats, and further elaborate on how GES and targets for seabed habitats are expected to be achieved.

16. United Kingdom

General conclusions on the United Kingdom's programme of measures

General strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the United Kingdom's programme of measures addresses GES and targets for commercial fish and shellfish (D3), eutrophication (D5), contaminants (D8), marine litter (D10), birds (D1, 4) and fish (D1, 4). In Gibraltar, the programme addresses GES and targets for non-indigenous species (D2), contaminants in seafood (D9), marine litter (D10) and birds (D1, 4). - In the North-East Atlantic, the Member State considers that GES will be achieved by 2020 for all descriptors except commercial fish and shellfish (D3), contaminants (D8) and fish (D1, 4). In Gibraltar, the United Kingdom considers that GES is already achieved for hydrographical changes (D7) and water column habitats (D1, 4) and will be achieved by 2020 for non-indigenous species (D2), eutrophication (D5), marine litter (D10), underwater noise (D11), birds and mammals (D1, 4) as well as seabed habitats (D1, 4, 6). In Gibraltar, the Member State considers that GES is already achieved for hydrographical changes (D7) and water column habitats (D1, 4). - In the North-East Atlantic, the programme has brought together and coordinated existing national measures and processes. It includes measures that are based on commitments to existing European, regional and international policies, such as the Maritime Spatial Planning Directive (all descriptors), the Environmental Impact Assessment Directive and the Strategic Environmental Assessment (all descriptors); the Common Fisheries Policy (D3, D1, 4, 6), the Urban Wastewater Treatment Directive (D5, D10), the National Emissions Ceiling Directive (D5), the Water Framework Directive (WFD) (D5, D7, D8), the Habitats Directive (D7, D1, 4, 6), the Industrial Emissions Directive (IED) (D8, D9), Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs (D9), the Birds Directive (D1, 4, 6), the OSPAR convention (D2, D6, D8, D10) and the IMO (D2, D5, D8). - In Gibraltar, the programme includes measures that are based on commitments to existing European policies, such as the Birds and Habitats Directives (D1, 4, 6), Regulation (EU) No 1143/2014 (D2), the Water Framework Directive (WFD; D5, D7, D8, D1, 4, 6), Urban Wastewater Treatment Directive (UWWTD; D5), the National Emission Ceiling Directive (D5), the Industrial Emissions Directive (D5, D8), the Maritime Spatial Planning Directive (D7), Regulation (EC) No 1881/2006 on setting maximum levels for certain contaminants in foodstuffs (D9), the Environmental Impact Assessment (EIA) Directive (D7, D11), as well as international instruments such as or the IMO-Ballast Water Management Convention (D2). - In both regions, the programme includes spatial protection measures (including MPAs). These measures address more than one descriptor at a time and therefore contribute towards GES and targets for several

	<p>descriptors. Measures especially include the strengthening of MPA networks and the establishment of management measures within MPAs.</p> <ul style="list-style-type: none"> - In both regions, the programme combines direct and indirect measures. Most measures directly address pressures on the marine environment. Indirect measures complement these, through governance and coordination actions, as well as awareness-raising efforts. - Based on the information reported by the United Kingdom on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the likelihood of implementation is high in both regions — most measures have secured funding and the responsible bodies for implementation have been clearly identified. Nevertheless, a reporting gap is noted in its reporting, as the timeline of implementation of existing but not yet implemented measures is not specified. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. especially D10 in Gibraltar and D11 in the North-East Atlantic), the Member State reports research efforts. This will allow addressing knowledge gaps, but also to build upon the results to design measures which can contribute directly to tackling underwater noise, in the MSFD's second implementation cycle. - The spatial scope of the measures is specified consistently across the programme in the North-East Atlantic only.
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme only partially addresses GES and targets for non-indigenous species (D2), hydrographical changes (D7), contaminants in seafood (D9), underwater noise (D11), mammals (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). In Gibraltar, it partially addresses GES and targets for commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants (D8), underwater noise and energy (D11), fish and mammals (D1, 4), and seabed habitats (D1, 4, 6). - In Gibraltar, the programme does not include specific measures for water column habitats (D1, 4). - In the North-East Atlantic, the Member State considers that GES will not be achieved by 2020 for commercial fish and shellfish (D3), contaminants (D8) and fish (D1, 4). In Gibraltar, no GES definitions have been provided for commercial fish and shellfish (D3) and contaminants in seafood (D9), and the programme does not include any timeline for the achievement of GES for contaminants (D8), which also cannot be estimated for fish (D1, 4). - In the North-East Atlantic, exceptions are applied for fish biodiversity (D1, 4), commercial fish and shellfish (D3), and contaminants (D8). - In the North-East Atlantic, while GES is not expected to be achieved by 2020 for several descriptors, the Member State has not defined any new measures. - In Gibraltar, the programme does not include new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered. - In Gibraltar, in some cases, the programme does not include sufficient links to existing European policies, international instruments and regional

	<p>actions. It is especially the case for D5, D7, D8, D9, D10 and D11.</p> <ul style="list-style-type: none"> - In the North-East Atlantic, the programme includes spatial measures whose exact geographical coverage was not clear at the time of reporting. Therefore, it is not possible to provide a clear and specific assessment on the management efforts in place (or to be implemented in the future). In Gibraltar, the programme also does not provide details on spatial protection measures. However, the Member State stated for each descriptor (D2, D3, D5, D7-11) and species group and habitat (D1, 4, 6) whether the measures are contributing to the MPA network under the MSFD. 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 and the policies and measures that will be in place within these areas. - In both regions, but especially in Gibraltar, the Member State does not make sufficient links between the measures for the pressure descriptors and how they may benefit state (biodiversity) descriptors. This prevents making clear links between the measures and the targets and GES for state descriptors and having a comprehensive view of the benefits of the measures. - A quantification of what the measures will achieve has not been provided in neither of the two regions; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - In Gibraltar, the spatial scope of the measures is not specified consistently across the programme. - In Gibraltar, the programme sometimes includes few data collection efforts, as measures. - In both regions, the United Kingdom does not always provide sufficient details about the measures to understand how they will contribute to progress towards targets and GES (as defined by the Member State).
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme addresses the introduction of non-indigenous species by tackling aquaculture (only in the North-East Atlantic) and shipping via ballast water management (linked to the BWMC) and anti-fouling measures (in both regions). - In the North-East Atlantic, the programme addresses recreational vessels. - In the North-East Atlantic, the programme also covers the oil and gas activities as a source of introductions of non-indigenous species. - In Gibraltar, the programme includes early warning systems for introductions of non-indigenous species as measures.
Weaknesses	<ul style="list-style-type: none"> - In Gibraltar, the programme does not address introductions of non-indigenous species from tourism/recreational activities (including recreational vessels), as well as aquaculture and fisheries (reported as relevant in the region by neighbouring Member States). - In the North-East Atlantic, it does not include early warning systems of non-indigenous species introductions as measures. - In the North-East Atlantic, the programme does not tackle the development of action plans for key high-risk marine non-indigenous species.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses the extraction of

	<p>species by commercial fishing.</p> <ul style="list-style-type: none"> - In Gibraltar, it addresses the extraction of species from recreational fishing. - In the North-East Atlantic, the programme includes seasonal and spatial fishing bans (for several purposes including stock management and biodiversity conservation) that are in addition to existing CFP measures. - The measures cover stocks managed at the national and international level, non-targeted species (in the North-East Atlantic) as well as age/size structure (in both regions). - In the North-East Atlantic, most waters are covered, even beyond the Exclusive Economic Zone (activities of the Member States' commercial fleet, regardless of where they are operating). - In Gibraltar, the programme refers to a Regional Fisheries Management Organisation: ICCAT. - In Gibraltar, it includes blanket bans for fisheries (for the protection of all species listed in ICCAT).
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, it is not clear if recreational fishing is addressed. - In Gibraltar, the programme does not cover illegal fishing.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - In both regions, the programme addresses nutrient enrichment from urban, industry and shipping sources, while in the North-East Atlantic, it also covers agriculture, and waste water sources. - In both regions, the programme draws from the Member State's WFD River Basin Management Plans (RBMP). 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 (i.e. mainly agriculture, industry, wastewater and flood risks). However, considering the extent to which the MSFD programme relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment. - In both regions, the measures address atmospheric deposition of nutrients (NOx).
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme does not cover aquaculture. - The programme for Gibraltar includes plans to build a sewage treatment plant, but no such plant currently exists.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses the interference of hydrological processes from marine-based renewable energy, oil and gas installations, marine mining (gravel) and port operations (activities reported as relevant by the United Kingdom), as well as land claim/coastal defence (reported as relevant by most neighbouring Member States). - In both regions, the programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisation and regulatory procedures are addressed in terms of hydrographical changes (including land claim/coastal defence, dredging, industry and urban area in Gibraltar). - In the North-East Atlantic, the programme utilises synergies with the EIA and SEA Directives, as well as with the WFD.
Weaknesses	<ul style="list-style-type: none"> - In both regions, the programme of measures does not explain how it will

	<p>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 the United Kingdom.</p> <ul style="list-style-type: none"> - In Gibraltar, the programme does not include measures targeting desalination plants. - In Gibraltar, as there is much overlap with the WFD in coastal waters and other existing policies, the Member State tends to consider — without sufficient justification — that MSFD requirements (of achieving GES and targets) can be fully met by the measures defined under other policies (such as the WFD). The measures for hydrographical changes (D7) are a transfer of these measures into the MSFD programme but it is not clearly explained how these will contribute to meeting MSFD objectives. - In Gibraltar, since the Member State considers that the present state is at GES, the programme focuses on measures to address new activities and projects, without assessing the scale of past impacts. - In Gibraltar, the programme does not include measures on implementing SEA procedures. Integrated coastal zone management processes could also contribute to D7 but are not referred to by the Member State.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of contaminants from land-based sources (e.g. industry (in both regions) and recreation/tourism (in the North-East Atlantic)) and sea-based sources (e.g. shipping (in both regions)). Additional activities covered are oil and gas extraction (in the North-East Atlantic), port operations (in Gibraltar) and urban areas (in both regions). - In Gibraltar, the programme does not specifically cover agriculture but agricultural discharges do not originate from activities within Gibraltar's territory. - It addresses accidental pollution from shipping (in both regions) and marine hydrocarbon extraction (in the North-East Atlantic). - In both regions, the programme addresses atmospheric deposition of contaminants. - In the North-East Atlantic, it addresses the biological effects of contaminants. - In both regions, the programme includes measures dedicated to contaminants in seafood (D9) (but they only refer to existing policies).
Weaknesses	<ul style="list-style-type: none"> - In both regions, 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. - In Gibraltar, it is not clear whether the programme covers the biological effect of contaminants (oiled seabirds).
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme of measures addresses marine litter by covering land-based (e.g. industry, tourism) and sea-based (e.g.

	<p>fisheries) sources of litter. In Gibraltar, the programme addresses marine litter through measures covering shipping and tourism/recreational activities.</p> <ul style="list-style-type: none"> - In both regions, the United Kingdom’s programme addresses the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. - In the North-East Atlantic, it is likely to cover both macro and micro-litter (although it is not completely clear). - In Gibraltar, the programme specifically covers macro-litter with measures targeting litter removal and is likely to also address micro-litter through links with other existing policies. - In Gibraltar, the programme includes indirect measures to address knowledge gaps for marine litter, which, while not yet fully addressing the problem, will positively contribute to better characterising the pressure and its potential impact on fauna.
Weaknesses	<ul style="list-style-type: none"> - In the North-East Atlantic, it is not clear whether micro-litter is addressed by the measures. - In both regions, although the GES definition refers to ‘degradation products’, it is not clear whether direct measures are in place to tackle these degradation products. - In both regions, due to the lack of knowledge and reporting on the effects of marine litter on biota, it is unclear how the Member State will interpret the issue of ‘do not pose a significant risk to the coastal and marine environment, either as a result of direct mortality such as through entanglement, or by way of indirect impacts such as reduced fecundity or bioaccumulation of contaminants within food chains’, although this aspect has been included in its GES definition.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses continuous and impulsive underwater noise from marine-based renewable energy generation, marine hydrocarbon extraction, dredging, land claim/coastal defence and shipping. - In Gibraltar, it addresses impulsive noise through general measures about EIA that are likely to cover dredging activities (port maintenance). - In the North-East Atlantic, the programme includes measures which aim to implement a register for noise-generating activities.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address underwater noise from marine research (reported as relevant in Article 8 for the North-East Atlantic), as well as other sources of impulsive noise, such as anchoring, and continuous noise due to shipping and recreational activities (reported as relevant in Article 8 for Gibraltar). - In both regions, the programme does not address other energy inputs (e.g. light and heat).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme addresses incidental by-catch by fisheries (in both regions), shipping and recreational activities (in Gibraltar), as well as the effects of non-indigenous species, contaminants, marine litter, habitat loss and visual disturbances (in the North-East Atlantic).

	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses biological disturbance caused by various activities.
Weaknesses	<ul style="list-style-type: none"> - In Gibraltar, the programme does not explain how the effects of non-indigenous species, contaminants, marine litter, noise and light pollution on seabirds are addressed. It is possible that these pressures are addressed by the groups of measures reported for non-indigenous species (D2), 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 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - In both regions, the programme of measures addresses incidental by-catch by fisheries. - In the North-East Atlantic, the programme addresses biological disturbances from various activities. - In the North-East Atlantic, the programme includes spatial protection measures to complement measures for commercial fish and shellfish (D3) and protect non-commercial species as well as fish habitats.
Weaknesses	<ul style="list-style-type: none"> - In Gibraltar, the programme of measures does not address illegal fishing. - In Gibraltar, it also does not include specific information about individual spatial protection measures to complement commercial fish and shellfish (D3) and protect non-commercial species as well as functional fish habitats (the Member State however specifies whether the measures are contributing to the MPA network under the MSFD, which is the case for fish (D1, 4)). - In Gibraltar, the programme does not include specific measures or plans for cephalopod species.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the programme addresses incidental by-catch by fisheries, collision with ships as well as prey depletion/competition. Contaminants, underwater noise and biological disturbances are also addressed. - In Gibraltar, the programme addresses pressures on mammal habitats through existing regulations. - In the North-East Atlantic, the programme also includes spatial protection measures to address several pressures such as by-catch and underwater noise.
Weaknesses	<ul style="list-style-type: none"> - In Gibraltar, the programme does not specifically address selective extraction of species (incl. accidental by-catch) from fisheries, as well as contaminants, underwater noise and impacts on mammals due to shipping (collisions). - The United Kingdom's programme does not explain how the effect of marine litter (in both regions), contaminants and underwater noise (in Gibraltar) on mammals is addressed. It is possible that these pressures are addressed by the measures reported for contaminants (D8), marine litter (D10) and underwater noise (D11), but this cannot be confirmed from the information reported (it can therefore be considered as a shortcoming in the reporting).
D1, 4 — Water column habitats	

Strengths	<ul style="list-style-type: none"> - In both regions, the Member State addresses pressures on water column habitats via measures reported for other descriptors (namely commercial fish and shellfish (D3) and eutrophication (D5)). - In both regions, the United Kingdom specifies that phytoplankton and zooplankton communities in its waters are considered to be healthy and that no significant pressures exist.
Weaknesses	<ul style="list-style-type: none"> - In both regions, the programme does not include dedicated measures addressing water column habitats. It may be that pressures on water column habitats are addressed via measures reported for non-indigenous species (D2), hydrographical changes (D7) and contaminants (D8); but how they will contribute to addressing pressures on water column habitats (D1, 4) specifically cannot be assessed based on the information reported.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - In the North-East Atlantic, the United Kingdom addresses physical loss and damage caused by fisheries and land claim/coastal defence.
Weaknesses	<ul style="list-style-type: none"> - In Gibraltar, the programme partially addresses physical loss and damages, as it is not clear whether shipping, tourism/recreational activities, anchoring, dredging as well as land claim and coastal defence operations are covered (although reported as relevant sources of pressures by the Member State). - In the North-East Atlantic, it is not clear whether the programme addresses physical loss and damage from marine renewable energies, marine hydrocarbon extraction, mining, aquaculture and shipping. - In the North-East Atlantic, it is not clear whether it addresses physical loss from port operations and solid waste disposal. - In the North-East Atlantic, it is not clear whether the programme addresses physical damage from dredging and recreational activities. - In the North-East Atlantic, the programme includes measures that target destructive fishing practices particularly in MPAs and minimal consideration is given to the broader issues of trawling outside of these spatially protected areas. - Spatial protection measures are often lacking in detail on their area coverage and temporal ranges of restrictions. - In Gibraltar, pressures on seabed habitats are especially addressed through spatial protection measures, which will also limit the extent of geographical area of where restrictions of certain practices are applied and the extent to which seabed habitats are protected. - Most measures relate to physical loss and damage for seabed habitat, with minimal consideration of other pressures such as non-indigenous species (D2), eutrophication (D5) and marine litter (D10). It is possible that pressures on seabed habitats are addressed by the groups of measures reported for non-indigenous species (D2), eutrophication (D5) 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.
Exceptions	
<p>The United Kingdom applies an exception for commercial fish and shellfish (D3) and fish (D1, 4). It applies Article 14(1)(e) (‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’). The exception states that the</p>	

programme of measures will allow for GES (related to fish) to be achieved, but not in time for the MSFD's 2020 deadline. It will take time for the measures to actually reduce exploitation rates, and allow for fish, elasmobranch and shellfish to achieve the desired length and biomass. Furthermore, stock recovery can be affected by biological and climatic conditions that cannot be controlled through measures.

This assessment finds that the justifications provided are grounded. It should be noted that the Member State does not specify when GES is expected to be achieved as per MSFD requirements (in relation to Article 14(1)(e)).

The UK applies an exception for contaminants (D8). It applies Article 14(4) ('no significant risks and disproportionality of costs'). The exception states that GES will be achieved for most substances except those that are so persistent that they will exceed limit values for a long time beyond 2020. For these substances, the application of removal/remediation measures is considered by the UK to be technically unfeasible and, according to the UK, would entail disproportionate costs.

This assessment finds that the justification of the exception provided is partially grounded. The exception needs a more in-depth justification, including a cost-benefit analysis and an analysis of the pros and cons of alternative remediation actions, in order to make a definitive judgment. Furthermore, this assessment finds that the application of an exception under Article 14(4) is not suitable, as the justification provided hints to natural conditions of the marine environment in the region.

Recommendations for the United Kingdom to consider in its programme of measures:

General

- In both regions, in general, the United Kingdom should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below.
- In the North-East Atlantic, GES and targets definitions should be better addressed for non-indigenous species (D2), hydrographical changes (D7), contaminants in seafood (D9), underwater noise (D11), mammals (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). In Gibraltar, GES and targets definitions should be better addressed for commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants (D8), underwater noise and energy (D11), fish and mammals (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6).
- In Gibraltar, the Member State should establish specific measures for water column habitats (D1, 4).
- In the North-East Atlantic, the Member State should estimate the alternative dates by when GES will be achieved (relevant to D3, D8 and D1, 4 — Fish). In Gibraltar, the United Kingdom should provide a timeline for the achievement of GES for contaminants (D8) and fish (D1, 4).
- In both regions, the Member State should establish new measures that complement those already in place to specifically target pressures on the marine environment which were not otherwise covered, especially when GES is not expected to be achieved by 2020 (for the North-East Atlantic).
- In Gibraltar, the Member State should establish better links with existing EU policies as well as regional and international instruments for eutrophication (D5), hydrographical changes

<p>(D7), contaminants (D8), contaminant in seafood (D9), marine litter (D10) and underwater noise and energy (D11).</p> <ul style="list-style-type: none"> - In both regions, the United Kingdom’s programme should provide more information about its measures and especially its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs, exact geographical coverage). - In Gibraltar, it should define the spatial scope of its 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 all marine waters. - Especially in Gibraltar, the United Kingdom should make better links between the groups of 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. - In both regions, the Member State should quantify the pressures present in its waters and their expected level of 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 Gibraltar, the United Kingdom should consistently specify the spatial scope of the measures. - In both regions, the Member State should clearly identify the timelines for implementation of all its existing but not yet implemented measures. - In Gibraltar, it 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 ensure better linkages between the programme of measures and the monitoring programme (currently done for D2, D3, D10 and the biodiversity descriptors in Gibraltar), 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 programme.
<p>D2 — Non-indigenous species</p> <ul style="list-style-type: none"> - In Gibraltar, the Member State should establish measures that cover tourism/recreational activities (including recreational vessels) and defence operations (reported by the Member State as relevant sources of pressure), as well as aquaculture and fisheries (reported by most of the neighbouring Member States). - In the North-East Atlantic, the Member State should establish action plans for key high risk marine non-indigenous species by 2020 and early warning systems of non-indigenous species introductions.
<p>D3 — Commercial fish and shellfish</p> <ul style="list-style-type: none"> - In the North-East Atlantic, the Member State should cover recreational fishing activities. - In Gibraltar, the Member State should establish measures that cover illegal fishing.
<p>D5 — Eutrophication</p> <ul style="list-style-type: none"> - In the North-East Atlantic, the Member State should establish measures that consider nutrient inputs from aquaculture. - In Gibraltar, the Member State should provide further efforts to ensure the building of sewage treatment plants.

D7 — Hydrographical changes
<ul style="list-style-type: none"> - In both regions, the Member State should address cumulative impacts on habitats from multiple developments. - In Gibraltar, the Member State should establish measures targeting desalination plants. - In Gibraltar, the Member State should provide more information about its measures to understand how the measures defined under other policies (such as the WFD) will contribute to meeting MSFD objectives. - In Gibraltar, the Member State should assess the scale of past impacts. - In Gibraltar, 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. - In both regions, 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.
D8/9 — Contaminants and Contaminants in seafood
<ul style="list-style-type: none"> - In both regions, the Member State should better explain the manner in which the D8 measures contribute to D9 targets. - In Gibraltar, the Member State should clearly address the biological effect of contaminants (oiled seabirds).
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should establish measures to address micro-litter (especially in the North-East Atlantic) and degradation products (in both regions), and ensure that litter does not pose a significant risk to the coastal and marine environment, either as a result of direct mortality such as through entanglement, or by way of indirect impacts such as reduced fecundity or bioaccumulation of contaminants within food chains, as suggested in its GES and targets definitions (in both regions). - In both the North-East Atlantic and the Mediterranean, the Member State should make efforts to identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.).
D11 — Underwater noise
<ul style="list-style-type: none"> - In the North-East Atlantic, the Member State should establish measures covering marine research and other energy inputs (such as light and heat). - In Gibraltar, the Member State should establish direct measures to cover activities that are known to produce high levels of noise, as soon as possible (e.g. shipping and recreational activities for continuous noise and anchoring for impulsive noise), as well as other energy inputs (i.e. light and heat). - In Gibraltar, the Member State should address data gaps and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable to then define more concrete and direct measures to address underwater noise in the second MSFD implementation cycle.
D1, 4 — Birds
<ul style="list-style-type: none"> - In Gibraltar, the Member State should establish additional measures to address pressures on birds beyond by-catch. Measures could target effects of non-indigenous species and litter ingestion, contaminants, noise and light pollution, 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 Gibraltar, the Member State should establish measures that address illegal fishing.

- In Gibraltar, the United Kingdom should establish spatial protection measures to protect non-commercial species in open sea areas, as well as functional fish habitats.
- In Gibraltar, it should establish measures that include additional MPAs in open sea areas to protect non-commercial fish species from various pressures (non-indigenous species, by-catch, noise and contaminants). 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.
- In Gibraltar, the Member State should provide more information on existing MPAs and the level of protection they provide for fish, in relation to where fish species occur within the Member State's territorial waters, and how they are protected.
- In Gibraltar, it should establish specific measures or plans for cephalopod species.

D1, 4 — Mammals

- In Gibraltar, the United Kingdom should establish additional measures, including spatial protection measures, to address relevant pressures on mammals such as by-catch, the impacts on mammal habitats due to shipping (collision), underwater noise, contaminants, 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.
- In the North-East Atlantic, it should specify how pressures on mammals beyond incidental by-catch are addressed (or will be addressed), such as marine litter.

D1, 4 — Water column habitats

- In both regions, the Member State should establish dedicated measures addressing water column habitats or more clearly indicate which measures reported under other descriptors (such as non-indigenous species (D2), hydrographical changes (D7) and contaminants (D8)) address pressures on water column habitats and elaborate on how GES and targets for water column habitats are expected to be achieved.

D1, 4, 6 — Seabed habitats

- In Gibraltar, the United Kingdom should establish additional measures, beyond those developed under other existing policies, covering shipping, tourism/recreational activities, anchoring, dredging as well as land claim and coastal defence operations.
- In the North-East Atlantic, it should establish measures addressing physical loss and damage from marine renewable energies, marine hydrocarbon extraction, mining, aquaculture and shipping.
- In the North-East Atlantic, the Member State should establish measures addressing physical loss from port operations and solid waste disposal.
- In the North-East Atlantic, the United Kingdom should establish measures addressing physical damage from dredging and recreational activities.
- In Gibraltar, it should establish measures that extend beyond spatially protected areas (and MPAs) to ensure a wider spatial coverage for these habitats.
- In both regions, the Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities, particularly beyond MPAs will allow for GES to be achieved.
- The Member State should more clearly indicate which measures reported under other descriptors (e.g. D2, D5, D10) address pressures for seabed habitats, and further elaborate on how GES and targets for seabed habitats are expected to be achieved.

Exceptions

The Member State should provide more robust justifications for its exceptions, when these are assessed as partially grounded. It should also specify when it expects GES to be achieved in relation to Article 14(1)(e).

PART II — SUMMARY FINDINGS AND RECOMMENDATIONS PER MEMBER STATE ON THEIR INITIAL ASSESSMENT, GES DETERMINATIONS AND ENVIRONMENTAL TARGETS, REPORTED UNDER ARTICLE 9(2) AND 10(2) OF DIRECTIVE 2008/56/EC

This part of the Annex only contains Member State-specific recommendations for Poland on its initial assessment (Article 8 of Directive 2008/56/EC), GES determination (Article 9 of Directive 2008/56/EC), and environmental targets (Article 10 of Directive 2008/56/EC), **since Poland, due to late reporting, was not part of the Commission's first and second assessments²².**

This Annex gives a summary of the findings in the Member State-specific technical assessments, made by the Commission's consultants on the basis of the Member State's reporting per descriptor and general questionnaire. It describes some general features and highlights, per article, strong and weak points; it addresses identified gaps in knowledge and information and plans to address them and concludes with recommendations.

1. Poland

GENERAL ISSUES

Marine waters

The Polish marine waters consist of the Polish territorial waters, including the coastal and transitional waters covered by the WFD, and the Polish Exclusive Economic Zone. Poland notes that it is currently in dispute with Denmark over an area close to Bornholm Island.

Areas assessed

The assessment covers the Polish part of the Baltic Sea. In addition, the Polish marine waters have been divided into subdivisions, in accordance with the decision of HELCOM CORESET BD working group²³. These include: Gulf of Gdańsk Offshore waters, Gulf of Gdańsk Polish Coastal waters, Bornholm Basin Offshore waters, Bornholm Basin Polish Coastal waters, Eastern Baltic Proper Offshore waters, Eastern Baltic Proper Polish Coastal waters, the Polish part of the Vistula Lagoon, and the Polish part of the Szczecin Lagoon. These assessment

²² Report from the Commission to the Council and the European Parliament 'The first phase of implementation of the Marine Strategy Framework Directive (2008/56/EC) — The European Commission's assessment and guidance' COM(2014) 097 final, and its accompanying Commission Staff Working Document, 20.2.2014, SWD(2014) 49 final, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0049&from=EN>; and Report from the Commission to the European Parliament and the Council [assessing Member States' monitoring programmes under the Marine Strategy Framework Directive COM/2017/03 final](#), and its accompanying Commission Staff Working Document, 20.2.2014, SWD(2017) 1 final.

²³ <http://www.helcom.fi/helcom-at-work>

areas are used in the initial assessment as well as for setting GES and target limit values (different values for different areas) for certain descriptors.

Regional cooperation

Regional cooperation is not described in detail in the reporting sheet or the paper report. Poland only mentions cooperation with other HELCOM countries within HELCOM workings groups in the reporting sheet. Yet, as mentioned before, Poland often refers to HELCOM indicators developed within HELCOM CORESET and to other HELCOM-related activities (e.g. HELCOM COMBINE, HELCOM FISH, HELCOM RED LIST, etc.) in its Articles 8, 9 and 10 reporting. In addition, Poland has submitted the Baltic Sea Roof Report of December 2012 from the HELCOM GEAR Group as part of its MSFD reporting to the Commission.

Other features

The approach used by Poland for the socio-economic analysis of the marine uses is the Water Accounts Approach²⁴. For the socio-economic analysis of the cost of degradation, Poland has used the cost-based approach.

DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points

All the descriptors under the MSFD are covered.

Regular reference is made to EU legislation and to HELCOM.

Weak points

For Descriptor 1, criteria 1.1 (species distribution) and 1.4 (habitat distribution) are not addressed. Further reference to Birds and Habitats Directives would strengthen the GES definition.

For Descriptor 6, criterion 6.2 is addressed, but criterion 6.1 (physical damage) is not addressed.

For Descriptor 7, the Polish GES definition is a mere reproduction of the Annex I GES definition and Commission Decision Criteria and indicators. The definition is not measurable.

Overall score

There are partially good GES definitions for Descriptors 1, 2, 3, 4, 5, 8, 9, 10, and 11. Not all indicators are addressed, and in some cases limited links to relevant legislations are made.

²⁴ <http://www.eea.europa.eu/publications/water-assets-accounts-report>.

There are inadequate GES definitions for Descriptors 6 and 7, as they do not cover all criteria or define its terms or baseline or refer to relevant EU standards or are not specific enough to be measurable.

INITIAL ASSESSMENT (ART. 8)

Strong points

The initial assessment generally identifies well the main pressures on the marine environment and their sources (e.g. for physical damage). There is use of relevant Habitats Directive, Water Framework Directive (WFD) and HELCOM assessments, including provision of current status for some elements (e.g. certain habitats and species under the Habitats Directive).

Weak points

No initial assessment is reported for Descriptor 11.

There is insufficient quantification of the pressures and their impacts and only limited assessments of hydrographical changes, physical loss and acute pollution events. Assessment coverage varies significantly for the different contaminants and Polish waterbodies.

There are few conclusive judgments on current status for a number of descriptors, pressures and ecosystem components (especially in relation to D1 for which relevant information for pressures is not reported).

There is insufficient detail on how gaps in knowledge are going to be addressed.

Overall score

The Initial Assessment is assessed as being adequate for Descriptors 3 and 5.

For Descriptors 1 (features), 2, 4, 6, 7, 8, 9 and 10 the Initial Assessment is considered partially adequate, with several key elements missing or poorly assessed and limited assessments of impacts.

For Descriptors 1 (pressures) the Initial Assessment is considered to be inadequate.

No assessment is made for Descriptor 11, which is a gap.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points

Targets are defined for all Descriptors.

Weak points

Many of the targets remain very general and progress towards their achievement can often not be measured or lack ambition.

The indicators chosen for the targets are not always suitable to measure progress towards the relevant target.

Overall score

The targets for Descriptors 1, 2, 3, 4, 5, 8, 9, and 10 have been assessed as partially adequate since they lack some specificity (thresholds, baselines).

The targets for Descriptors 6, 7 and 11 are considered inadequate. For Descriptor 6, targets are general and do not take into account the sustainable use of the sea, they do not include baselines and thresholds and do not address GES indicators 6.2.1 and 6.2.2. For Descriptor 7, they lack reference to hydrographical changes or specification and are therefore not measurable. For Descriptor 11, they are not measurable and do not address all aspects of the GES definition in particular heat and electromagnetic waves.

CONSISTENCY

There is a good level of consistency between GES, the initial assessment and the environmental targets for most descriptors. There is lack of consistency for Descriptor 6 and Descriptor 11, and reporting for D9 is only partially consistent.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Justification and explanation on gaps in data/knowledge and assessment methodology are sometimes described. Plans to address gaps are also sometimes described, but in a very limited manner.

RECOMMENDATIONS

Poland should:

- a) Significantly strengthen the GES definition of D1, D6 and D7;
- b) Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

- c) Identify knowledge and information gaps and address these, i.e. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;
- d) Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;
- e) Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;
- f) Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

PART III — SUMMARY FINDINGS AND GUIDANCE PER MEMBER STATE ON MONITORING PROGRAMMES, REPORTED UNDER ARTICLE 11(3) OF DIRECTIVE 2008/56/EC²⁵

This part of the Annex only contains Member State-specific guidance for those Member States that were not part of the Commission's assessment of Member States' monitoring programmes in 2017, due to late reporting from these Member States. Those are: Malta, Greece, Malta, Poland and the United Kingdom (but for the waters surrounding Gibraltar).

These summaries result from technical Member State-specific assessments²⁶, which analyse Member States' reporting of their monitoring programmes per descriptor²⁷, under Article 11(3) of Directive 2008/56/EC. It describes the conclusions of these technical assessments, the achievement so far, the aspects where improvement is needed and it provides outcome per descriptor.

Methodology

The adequacy of the MSFD monitoring programmes has been assessed by considering whether the programmes and related sub-programmes of Member States are sufficient to cover the monitoring needs for the assessment of progress towards achieving Good Environmental Status (GES) and environmental targets, as defined by each Member State. The outcome of the assessment is therefore partly dependent on the ambition level of the Member State's determination of GES and targets.

The overall conclusion and guidance per Member State given at the beginning of each Member State's section is however based on an assessment of their monitoring programme with regard to coverage of progress towards GES achievement only, referring to the main objective of the MSFD. For each descriptor, the Commission assessed the monitoring programmes, in particular their purpose, spatial scope, implementation timeline, and regional coherence, and concluded overall on whether they constitute an appropriate framework to meet the requirements of the MSFD.

²⁵ 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), hereafter referred to as Marine Strategy Framework Directive or MSFD.

²⁶ The technical Member State-specific assessments were prepared for the Commission by an external consultant and are found at http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/implementation/reports_en.htm

²⁷ The 11 qualitative descriptors are defined in Annex I of 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 associated to a number between 1 and 11. The numbers refer to the respective numbered points in Annex I of 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.

1. Greece

Greece reported under Article 11 of the MSFD in February 2017. In total, Greece's Article 11 reporting includes 29 sub-programmes covering all descriptors.

General conclusions on adequacy/coverage

The adequacy of the Greek MSFD monitoring programme has been assessed by considering whether the programme and related sub-programmes are sufficient to cover the monitoring needs for the assessment of progress towards GES and achievement of environmental targets, as defined by the Member State in 2013 (with one set of targets for commercial fish and shellfish (D3) having been further refined in 2017).

The following table provides an overview (by descriptor) of:

- The conclusions of the technical assessment in relation to the coverage of GES and targets by the Member State's monitoring programme and sub-programmes;
- The Member State's own assessment of the date by which their monitoring programme is or will be adequate to measure progress towards GES and targets;
- Whether the Member State has provided justifications and/or plans to address (any) gaps.

Descriptor	0		MS assessment		MS plans/justifications
	GES	Targets	GES	Targets	
D1, 4 Birds			NA	NA	No
D1, 4 Mammals and reptiles			NA	NA	No
D1, 4 Fish and cephalopods			NA	NA	No
D1, 4 Water column habitats			NA	NA	No
D1, 4, 6 Seabed habitats			NA	NA	No
D2 Non-indigenous species			NA	NA	No
D3 Commercial fish and shellfish			NA	NA	No
D5 Eutrophication			NA	NA	No
D7 Hydro. changes			NA	NA	No
D8 Contaminants			NA	NA	No
D9 Seafood cont.			NA	NA	No
D10 Marine litter			NA	NA	No
D11 Underwater noise and energy			NA	NA	No

	Coverage
	Partial coverage
	No coverage
	Not applicable (GES/targets not defined, no monitoring programme reported or no conclusion to be reached from the reported information)

The MSFD monitoring sub-programmes for all descriptors need further refinement and development to constitute an appropriate framework to monitor progress towards the related GES.

Achievements so far

- The technical assessment also shows that even though targets have not yet been defined for birds, the Member State has already designed monitoring sub-programmes for this species group, which is positive.
- The Greek monitoring programme shows consistency with the standards and guidelines produced by UNEP/MAP, bringing in a regional dimension in the work done by the Member State. Furthermore, the modified GES indicators for D3 make the direct link with UNEP/MAP guidance.

Aspects where improvement is needed

- According to the technical assessment, the Greek monitoring programme shows a number of weaknesses that affect its coverage of GES and targets for the biodiversity descriptors as well as D3, D5 D8, D9; and descriptors considered less advanced in terms of knowledge and methodologies, i.e. D2, D7, D10 and D11.
- Regarding commercial fish and shellfish (D3); while the design of the reported monitoring programme covers the elements and parameters needed to measure progress towards GES and targets; Greece's non-implementation of the Data Collection Framework (CFP) between 2008-2013 may compromise the coverage of the MSFD needs to monitor progress towards GES and targets.
- Greece has not systematically reported on the links between its monitoring and EU regulation for a number of descriptors, in particular D5 (UWWTD, Nitrates Directive) and D7 (EIA Directive).
- Greece does not elaborate on monitoring transboundary impacts or any other major environmental changes or emerging issues. The Member State refers to climate change as an issue, but does not elaborate how this may be addressed via its programmes.

Recommendations

Greece should:

In general:

- (a) continue to integrate monitoring programmes already existing under relevant EU legislation and other international agreements, in particular the Habitats Directive²⁸, the Birds, Directive²⁹, the Water Framework Directive³⁰ and the Invasive Alien Species Regulation³¹ with MSFD monitoring programmes, while at the same time ensuring that MSFD- specific monitoring needs are appropriately met in terms of

²⁸ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

²⁹ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

³⁰ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

³¹ Regulation 1143/2014 on invasive alien species.

spatial scope and coverage as well as elements, parameters, habitats and species monitored.

- (b) continue to implement, where they exist, coordinated and joint monitoring programmes developed at regional or subregional level, for instance by UNEP/MAP.
- (c) enhance comparability and consistency of monitoring methods within its marine region, in particular, by considering the monitoring scope, coverage, frequency and choice of indicators with practices at the regional level.

In particular:

On biodiversity (in particular on Descriptors 1.4 and 6):

- (d) develop the monitoring programme to cover offshore areas;
- (e) develop the monitoring programme for fish and cephalopods to include non-commercial fish species;
- (f) clarify the spatial coverage for seabed habitats.

On non-indigenous species (Descriptor 2):

- (g) develop the monitoring programme to address impacts of non-indigenous species, as per its GES and target definitions.

On commercial fish and shellfish (Descriptor 3):

- (h) ensure that the monitoring programme for fish and shellfish is effectively implemented.
- (i) develop monitoring of recreational fishing.

On eutrophication (Descriptor 5):

- (j) Develop specific sets of threshold values for coastal and open sea locations in order to better assess their ecological features.
- (k) develop a monitoring programme that is better aligned with its target definitions, and that covers the necessary element and parameters to monitor the reduction of organic and nutrient loads to the sea.

On hydrographical conditions (Descriptor 7):

- (l) develop a programme to specifically monitor areas of projects susceptible to cause hydrographical changes on the surrounding habitats;
- (m) develop a programme that ensure the representativeness and appropriateness of methods of sampling in coastal as well as offshore areas;
- (n) develop a programme that addresses the 'environmental impact' component of its target.

On contaminants (Descriptor 8):

- (o) clarify and/or develop a monitoring programme that covers contaminants.

On contaminants in seafood (Descriptor 9):

- (p) clarify and/or develop a monitoring programme that covers contaminants in seafood.

On marine litter (Descriptor 10):

- (q) develop monitoring of impacts on biota (for macro-litter).

On underwater noise (Descriptor 11):

- (r) further develop the monitoring programme for continuous noise and ensure its implementation.

2. Malta

Malta reported under Article 11 of the MSFD in October 2015. In total, Malta's Article 11 reporting includes 40 sub-programmes covering all descriptors.





General conclusions on adequacy/coverage

The adequacy of the Maltese MSFD monitoring programme has been assessed by considering whether the programme and related sub-programmes are sufficient to cover the monitoring needs for the assessment of progress towards GES and achievement of environmental targets, as defined by the Member State in 2013.

The following table provides an overview (by descriptor) of:

- The conclusions of the technical assessment in relation to the coverage of GES and targets by the Member State's monitoring programme and sub-programmes;
- The Member State's own assessment of the date by which their monitoring programme is or will be adequate to measure progress towards GES and targets;
- Whether the Member State has provided justifications and/or plans to address (any) gaps.

Descriptor	Technical assessment		MS assessment		MS plans/justifications
	GES	Targets	GES	Targets	
D1, 4 Birds	Coverage	Partial coverage	2020	2020	Yes
D1, 4 Mammals	Partial coverage	Partial coverage	2014	2014	Yes
D1, 4 Fish	Partial coverage	Coverage	2020	2014	Yes
D1, 4 Water column	Coverage	Coverage	2020	2020	Yes
D1, 4, 6 Seabed	Coverage	Partial coverage	2020	2014	Yes
D2 Non-indigenous species	Partial coverage	Partial coverage	2020	2020	Yes
D3 Commercial fish	Coverage	Coverage	2020	2020	Yes
D5 Eutrophication	Coverage	Coverage	2014	2014	Yes
D7 Hydro. changes	Coverage	Coverage	2020	2020	Yes
D8 Contaminants	Partial coverage	Partial coverage	2020	2014	Yes
D9 Seafood cont.	Coverage	Not applicable	2014	Not applicable	Yes
D10 Marine litter	Partial coverage	Partial coverage	2020	2020	Yes
D11 Energy/Noise	Partial coverage	Partial coverage	2020	2020	Yes

	Coverage
	Partial coverage
	No coverage
	Not applicable (GES/targets not defined, or no monitoring programme reported)

The MSFD monitoring sub-programmes for biodiversity, non-indigenous species, contaminants, marine litter and underwater noise need further refinement and development to constitute an appropriate framework to monitor progress towards the related GES.

Achievements so far

- The technical assessment shows that Malta has developed its monitoring programme and sub-programmes in a consistent manner with its GES definitions and targets for D3, D5 and D7; and with its GES definitions for D9.
- The technical assessment also shows that even though targets have not yet been defined for D9, the Member State has already designed a monitoring sub-programme for this descriptor, which is positive.
- The Maltese monitoring programme shows consistency with the standards and guidelines produced by UNEP/MAP, bringing in a regional dimension in the work done by the Member State.
- Malta has provided plans for future work for all descriptors, even though it considers that its monitoring programme is, for the most part, already adequate to measure progress towards its GES and targets. This is in line with the principle of adaptive management.

Aspects where improvement is needed

- According to the technical assessment, the Maltese monitoring programme shows a number of weaknesses that affect its coverage of GES and targets for the biodiversity descriptors as well as for D8; and descriptors considered less advanced in terms of knowledge and methodologies, i.e. D2, D10 and D11.
- Malta does not elaborate on major environmental changes or emerging issues, but refers to the impacts and features it monitors as part of its monitoring sub-programmes.

Recommendations

Malta should:

In general:

- (a) continue to integrate monitoring programmes already existing under relevant EU legislation and other international agreements, in particular the Habitats Directive³², the Birds, Directive³³, the Water Framework Directive³⁴ and the Invasive Alien Species Regulation³⁵ with MSFD monitoring programmes, while at the same time ensuring that the MSFD-specific monitoring needs are appropriately met in terms of spatial scope and coverage as well as elements, parameters, habitats and species monitored.
- (b) continue to implement, where they exist, coordinated and joint monitoring programmes developed at regional or sub regional level, for instance by UNEP/MAP.

³² Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

³³ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

³⁴ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

³⁵ Regulation 1143/2014 on invasive alien species.

- (c) enhance comparability and consistency of monitoring methods within its marine region, in particular, by considering the monitoring scope, coverage, frequency and choice of indicators with practices at the regional level.

In particular:

On biodiversity (in particular on Descriptors 1, 4 and 6):

- (d) develop the monitoring programme for birds to address the target related to the impacts by rats and light pollution as well as improving the monitoring frequency.
- (e) develop the monitoring programme for mammals and reptiles to ensure an appropriate frequency of monitoring.
- (f) develop the monitoring programme for fish and cephalopods to improve the coverage of pelagic and coastal species.
- (g) develop the monitoring programme for seabed habitats in order to address knowledge gaps on benthic habitats from reefs, caves and littoral sediments, as well as clarify how it will assess the recovery of these habitats following the measures taken for offshore habitats.

On non-indigenous species (Descriptor 2):

- (h) develop the monitoring programme in order to allow a more detailed assessment of non-indigenous species impacts on the environment.

On commercial fish and shellfish (Descriptor 3):

- (i) provide more information on how their monitoring programme would collaborate in assessing the reproductive capacity of stocks (such as size at maturity and life history).

On hydrographical conditions (Descriptor 7):

- (j) ensure that cumulative impacts of projects are monitored.

On contaminants (Descriptor 8):

- (k) develop the monitoring programme to ensure that environmental impacts of acute pollution events are covered.
- (l) clarify the level of protection afforded by the national standards which are used instead of the EQSD ones.

On marine litter (Descriptor 10):

- (m) improve monitoring of micro-litter and of ingestion of litter by marine life.

On underwater noise (Descriptor 11):

- (n) develop the monitoring of diffuse and continuous noise.
- (o) address the impacts of underwater noise on the key species groups, as suggested by the GES definition.

3. Poland

Poland reported under Article 11 of the MSFD between June and October 2015. In total, Poland's Article 11 reporting includes 24 sub-programmes covering all descriptors.

General conclusions on adequacy/coverage

The adequacy of the Polish MSFD monitoring programme has been assessed by considering whether the programme and related sub-programmes are sufficient to cover the monitoring needs for the assessment of progress towards GES and achievement of environmental targets, as defined by the Poland in 2014 and 2015.

The following table provides an overview (by descriptor) of:

- The conclusions of the technical assessment in relation to the coverage of GES and targets by the Member State's monitoring programme and sub-programmes;
- The Member State's own assessment of the date by which their monitoring programme is or will be adequate to measure progress towards GES and targets;
- Whether the Member State has provided justifications and/or plans to address gaps.

Descriptor	Technical assessment		MS assessment		MS plans/justifications
	GES	Targets	GES	Targets	
D1, 4 Birds			2020	2018	Y
D1, 4 Mammals			2020	2020	Y
D1, 4 Fish			2020	2020	Y
D1, 4 Water column			2020	2020	Y
D1, 4, 6 Seabed			2020	2020	Y
D2 Non-indigenous species			2014	2020	Y
D3 Commercial fish and shellfish			2020	2020	Y
D5 Eutrophication			2014	2020	Y
D7 Hydro. changes			2018	2018	Y
D8 Contaminants			2018	2014	Y
D9 Seafood cont.			2018	2014	Y
D10 Marine litter			2018	2020	Y
D11 Energy/Noise			2020	2020	Y

	Coverage
	Partial coverage
	No coverage
	Not applicable (e.g. GES/targets not defined or programme not reported)

The MSFD monitoring sub-programmes for all descriptors apart from those of fish biodiversity, seabed habitats, eutrophication, and contaminants in seafood, need further refinement and development to constitute an appropriate framework to monitor progress towards some of the related GES and targets.

Achievements so far

- The technical assessment shows that Poland has developed its monitoring programme and sub-programmes in a highly consistent manner with its MSFD GES (Article 9) and environmental targets (Article 10). The Polish monitoring programme is considered sufficient to assess progress towards fish biodiversity, seabed habitats, non-indigenous species, eutrophication, and contaminants in seafood GES and targets.
- Regional cooperation has systematically been referenced by the Member State, with HELCOM being linked to monitoring activities under almost descriptors. The HELCOM monitoring manual is linked to all sub-programmes, apart from birds, fish and mammals, where EU Directives are referenced (Birds and Habitats, Common Fisheries Policy).
- Poland has provided plans for future work for a number of descriptors (e.g. development of indicators that will address phytoplankton (D5)).

Aspects where improvement is needed

- According to the technical assessment, the Polish monitoring programme shows a number of weaknesses that affect its coverage of GES and targets for birds (D1, 4), mammals (D1, 4), water column habitats (D1, 4), D2, D3, D7, D8, D10 and D11.
- Poland reports limited amount of information on transboundary impacts, major environmental changes and emerging issues.

Recommendations

In general:

- (a) continue to integrate monitoring programmes already existing under relevant EU legislation and other international agreements, in particular the Habitats Directive³⁶, the Birds, Directive³⁷, the Water Framework Directive³⁸ and the Invasive Alien Species Regulation³⁹ with MSFD monitoring programmes, while at the same time ensuring that MSFD- specific monitoring needs are appropriately met in terms of spatial scope and coverage as well as elements, parameters, habitats and species monitored.
- (b) continue to implement, where they exist, coordinated and joint monitoring programmes developed at regional or subregional level, for instance by HELCOM.
- (c) enhance comparability and consistency of monitoring methods within its marine region, in particular, by considering the monitoring scope, coverage, frequency and choice of indicators with practices at the regional level.

In particular:

³⁶ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

³⁷ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

³⁸ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

³⁹ Regulation 1143/2014 on invasive alien species.

On biodiversity (Descriptor 1, 4, 6):

- (d) further develop its monitoring programme to cover impacts on species and habitats (especially in relation to birds and mammals).
- (e) improve the spatial scope, coverage and temporal frequency of its monitoring programme for mammals.
- (f) clarify and improve the coverage of monitoring of seabed habitats (it is unclear what type of seabed habitats will be monitored).

On non-indigenous species (Descriptor 2):

- (g) further develop its monitoring programme to monitor more hotspots and pathways of introduction, as well as cover impacts of non-indigenous species as per their GES definition.

On commercial fish and shellfish (Descriptor 3):

- (h) further strengthen its monitoring programme by covering additional species reported as relevant (i.e. salmon) and shellfish (which is currently not covered).

On hydrographical conditions (Descriptor 7):

- (i) improve its monitoring programmes to cover appropriate habitats and impacts, including small scale events (link with EIA Directive).

On contaminants (Descriptor 8):

- (j) further strengthen the monitoring programme for D8 by monitoring biological impacts and acute pollution events, as per GES definition.

On marine litter (Descriptor 10):

- (k) strengthen its monitoring programme by defining and monitoring indicator species, and covering impact on marine life.

On underwater noise (Descriptor 11):

- (l) strengthen its monitoring programme for acute noise by improving the spatial and temporal frequency of its sampling.
- (m) expand its monitoring programme for this descriptor to also cover heat and electromagnetic waves, as per its GES definition.

4. United Kingdom (Gibraltar)

The UK reported under Article 11 of the MSFD for the marine waters of Gibraltar in March 2016. In total, the UK's Article 11 reporting for Gibraltar includes 25 MSFD sub-programmes, covering all descriptors.

General conclusions on adequacy/coverage

The adequacy of the UK MSFD monitoring programme has been assessed by considering whether the programme and related sub-programmes are sufficient to cover the monitoring needs for the assessment of progress towards GES and achievement of environmental targets, as defined by the UK in 2012-2013.

The following table provides an overview (by descriptor) of:

- The conclusions of the technical assessment in relation to the coverage of GES and targets by the Member State's monitoring programme and sub-programmes;
- The Member State's own assessment of the date by which their monitoring programme is or will be adequate to measure progress towards GES and targets;
- Whether the Member State has provided justifications and/or plans to address gaps.

Descriptor	Technical assessment		MS assessment		MS plans/justifications
	GES	Targets	GES	Targets	
D1, 4 Birds			2016	2016	Yes
D1, 4 Mammals and reptiles			2016	2016	Yes
D1, 4 Fish and cephalopods			2016	2016	Yes
D1, 4 Water column habitats			2016	2016	Yes
D1, 4, 6 Seabed habitats			2016	2016	Yes
D2 Non-indigenous species			2016	2016	No
D3 Commercial fish and shellfish			2016	2016	Yes
D5 Eutrophication			2016	2016	Yes
D7 Hydro. changes			2016	2016	No
D8 Contaminants			2016	2016	No
D9 Seafood cont.			2016	2016	No
D10 Marine litter			2016	2016	No
D11 Energy/Noise			2016	2016	No

	Coverage
	Partial coverage
	No coverage
	Not applicable (GES/targets not defined, or no monitoring programme reported)

The MSFD monitoring sub-programmes for eutrophication, hydrological changes, marine litter and underwater noise and energy need further refinement and development to constitute an appropriate framework to monitor progress towards some of the related GES and targets.

Achievements so far

- The technical assessment shows that with regard to measuring progress towards GES (Article 9) and the environmental targets (Article 10), the UK programme for Gibraltar is considered sufficient for a number of key pressure descriptors, including those D1, 4, 6, D2, D8 and D9.
- The UK monitoring programme shows some level of consistency with the standards and guidelines produced by the UNEP/MAP, even though it is not a contracting party of the Barcelona Convention, bringing in a regional dimension in the work done by the Member State.
- The UK has provided plans for future work for a number of descriptors, even though it considers that its monitoring programme is, for the most part, already adequate to measure progress towards its GES and targets. This is in line with the principle of adaptive management.

Aspects where improvement is needed

- According to the technical assessment, the UK monitoring programme for Gibraltar shows a number of weaknesses that affect its coverage of GES and targets for some descriptors, i.e. D5, D7, D10 and D11.
- For D3, the UK has not yet defined a specific MSFD monitoring programme for Gibraltar, and it does not plan to do so in the future based on the lack of a commercial fishing fleet.

Recommendations

The UK should:

In general:

- (a) continue to integrate monitoring programmes already existing under relevant EU legislation and other international agreements, such as the Habitats Directive⁴⁰, the Birds, Directive⁴¹, the Water Framework Directive⁴² or the Invasive Alien Species Regulation⁴³ with MSFD monitoring programmes, while at the same time ensuring that MSFD- specific monitoring needs are appropriately met in terms of spatial scope and coverage as well as elements, parameters, habitats and species monitored.
- (b) continue to implement, where they exist, coordinated and joint monitoring programmes developed at regional or sub regional level.

⁴⁰ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

⁴¹ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

⁴² Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

⁴³ Regulation 1143/2014 on invasive alien species.

- (c) enhance comparability and consistency of monitoring methods within its marine region, in particular, by considering the monitoring scope, coverage, frequency and choice of indicators with practices at the regional level.

In particular:

On commercial fish and shellfish (Descriptor 3):

- (d) develop a monitoring programme to cover recreational fishing of species beyond Bluefin tuna.

On eutrophication (Descriptor 5):

- (e) develop a monitoring programme for perennial seaweeds

On hydrographical changes (Descriptor 7):

- (f) clarify how the indicator species listed in the GES and targets are monitored.
- (g) address cumulative impacts, changes of circulation and physical loss or damage.

On marine litter (Descriptor 10):

- (h) develop its monitoring to cover seabed litter.

On underwater noise and energy (Descriptor 11):

- (i) develop a monitoring programme for continuous low frequency (ambient) noise from shipping.