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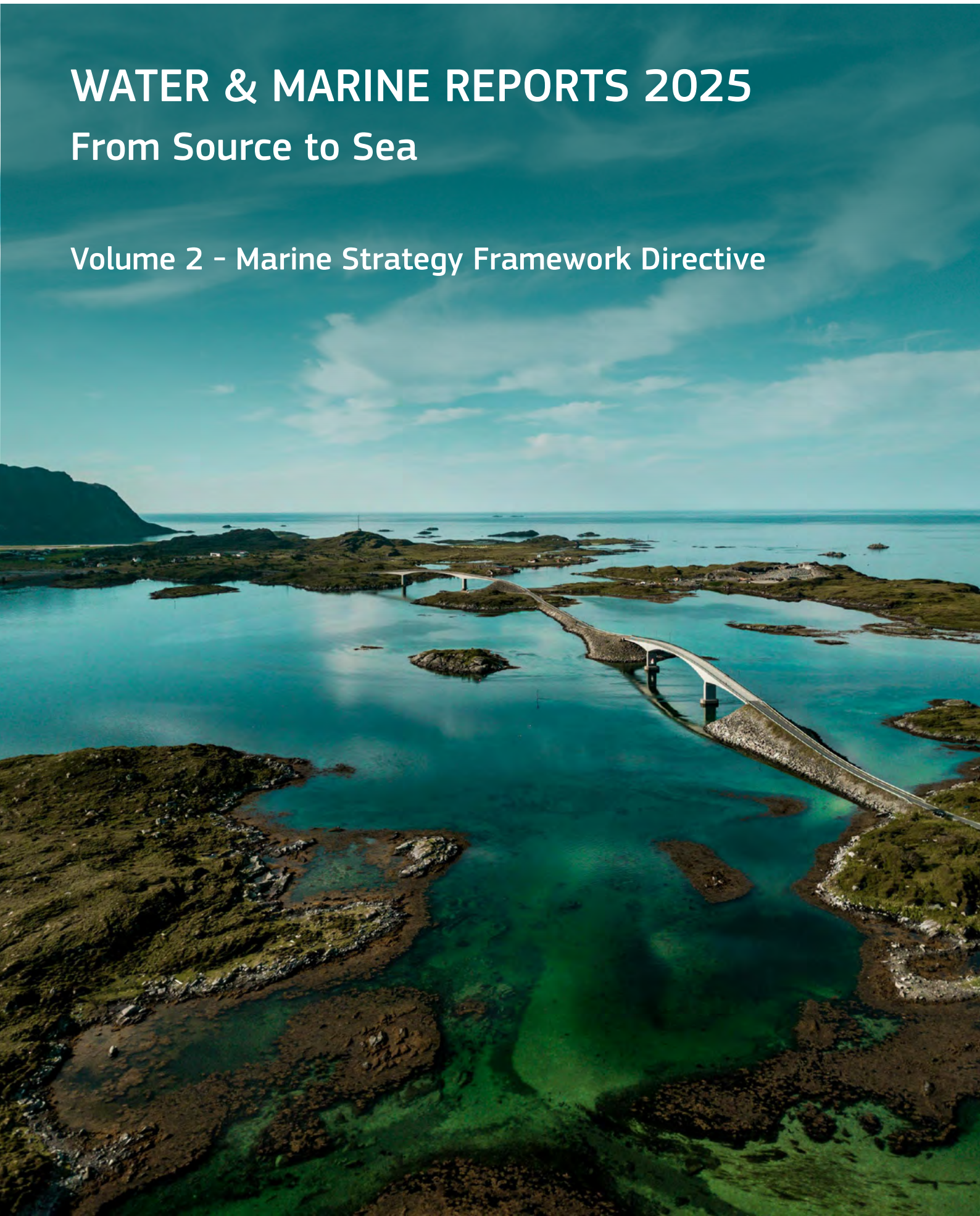

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REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the Commission's assesment of the Member States' programmes of measures as updated under Article 17 of the Marine Strategy Framework Directive (2008/56/EC)

COM(2025) 3 final

accompanied by

COMMISSION STAFF WORKING DOCUMENT

Marine Strategy Framework Directive
Assessment of Member States' second programmes of measures

SWD(2025) 1 final

INTRODUCTION

The seas and ocean are vital to the quality of our – and future generations' – lives, livelihoods and economies. They also perform a significant function in carbon sequestration, regulating the climate and helping reduce the impact of climate change. Ocean health can make a difference to our resilience to the triple planetary crisis, namely climate change, biodiversity collapse and pollution. The current use of Europe's seas, however, is not sustainable. Unabated pressure on and the deterioration of the marine ecosystems are making it difficult to achieve our overarching objective of clean, healthy and productive seas.

Over the past 12 years, EU Member States have developed marine strategies to comply with the Marine Strategy Framework Directive (MSFD) ([1]). The Directive requires them to assess the status of their marine environment, draw up monitoring programmes, set environmental targets and implement measures to achieve the Directive's key goal of securing the 'good environmental status' (GES) of all EU marine waters. This was to be achieved by 2020. The Directive sets out specific descriptors ([2]) that define the concept of GES, such as conserving biodiversity or tackling anthropogenic pressure such as underwater noise, eutrophication, seabed damage, marine litter and contaminants.

A Commission Decision ([3]) in force since June 2017 requires Member States to meet common criteria and methodological standards when determining 'good environmental status' in quantitative terms for their marine waters. Importantly, the MSFD explicitly requires Member States to cooperate with their neighbours in each marine region or sub-region, preferably through existing regional institutional cooperation structures ([4]), to ensure that the measures implemented are coherent and coordinated ([5]).

The European Green Deal ([6]) sets overarching priorities including protecting our biodiversity and ecosystems, therefore bolstering this work by pursuing the ambition to:

- reduce air, water and soil pollution;
- move to a circular economy;
- improve waste management; and
- ensure the sustainability of our blue economy and fisheries sectors.

The EU's biodiversity strategy ([7]), the zero pollution action plan ([8]) and the marine action plan ([9]) are the key policy instruments adopted to pursue these aims.

([1]) Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). See EUR-Lex - 32008L0056 - EN - EUR-Lex (europa.eu).

[2] The 11 qualitative descriptors are defined in Annex I to the Marine Strategy Framework Directive and further specified in Commission Decision 2017/848/EU. They include D1– Biodiversity, D2 – Non indigenous species (NIS), 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.

([3]) Commission Decision (EU) 2017/848 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment. See: EUR-Lex - 32017D0848 - EN - EUR-Lex (europa.eu).

([4]) Including the structures set up under Regional Sea Conventions.

([5]) Article 4 of Directive 2008/56/EC lists the EU marine regions and subregions. The four EU marine regions are the Baltic Sea, North-East Atlantic Ocean, the Mediterranean Sea and the Black Sea.

([6]) A European Green Deal (europa.eu).

([7]) Biodiversity strategy for 2030 (europa.eu).

([8]) Communication from the Commission, Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil', COM/2021/400 final. Available at: https://environment.ec.europa.eu/strategy/zero-pollution-action-plan_en.

([9]) Communication from the Commission, EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries, COM/2023/102 final. Available at: EUR-Lex - 52023DC0102 - EN - EUR-Lex (europa.eu)

The MSFD is part of a broader agenda on water resilience. The 2024-2029 Political Guidelines for the next College announced the adoption of a new European Water Resilience Strategy to strengthen Europe's water security by preserving water quality and quantity in the EU and beyond, enhancing the competitive innovative edge of our water industry, and addressing the root causes of water challenges, including pollution, biodiversity loss, and the impacts of climate change. Clean, healthy and productive seas and oceans are central to our green and digital transition and for the EU's long-term prosperity. The MSFD can also make a direct contribution to achieve the objectives of the forthcoming 'Ocean pact' announced by President von der Leyen in her Political Guidelines for the next Commission mandate to *'boost the blue economy and ensure the good governance and sustainability of our oceans in all of their dimensions'.*

This is the first time under the new policy framework that the Commission assesses the second programmes of measures under the MSFD. The assessment is performed in close coordination with the assessments of the third river basin management plans (RBMPs) and the second flood risk management plans under the Water Framework Directive (WFD) and the Floods Directive (FD) ([10]). To accelerate effective implementation, the Commission aims to encourage a more integrated and coherent approach in implementing freshwater and marine water legislation, in line with a 'source-to-sea' approach ([11]).

The assessment therefore focuses in particular on ensuring that implementation of the MSFD is consistent with the WFD. It should be noted, however, that the requirements of the two directives differ. The WFD/FD report thoroughly assesses the state of EU freshwater bodies based on data reported by the Member States and the measures they have taken to improve. The MSFD report, required by Article 16 of the MSFD, by contrast only assesses the Member States' programmes of measures. The two reports therefore differ slightly in scope so the comparisons are made on the common elements.

Although the programmes of measures were developed before the Nature Restoration Law was adopted ([12]), the implementation of the latter will certainly influence the third cycle of implementing the MSFD.

Purpose and structure

This report presents the main outcomes from the Commission's assessment of the second programmes of measures, which all Member States had to report by 31 March 2022 ([13]). These programmes are an update since the first implementation cycle and take account of the latest assessment of the state of marine waters and the Commission's 2018 recommendations on the measures ([14]). A more detailed analysis of the Member States' programmes of measures, the degree

([10]) Report from the Commission to the Council and the European Parliament on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) Third river basin management plans Second flood risk management plans, COM(2025) 2

([11]) Source-to-sea approach refers to the establishment of governance that increases collaboration and coherence across the source-to-sea system and reduces alteration of key flows (water, pollution, sediment, materials, biota, ecosystem services) resulting in measurable economic, social and environmental improvement across freshwater, coastal, nearshore, transitional and marine environments. It considers the entire source-to-sea system – stressing upstream and downstream environmental, social, and economic linkages and stimulating coordination across sectors and segments.

([12]) Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869, OJ L, 2024/1991, 29.7.2024.

([13]) See Article 13(9) of Directive 2008/56/EC.

([14]) Report from the Commission assessing Member States' programmes of measures under the Marine Strategy Framework Directive, Brussels, 31.7.2018 COM(2018) 562 final.

of regional coherence, country-specific conclusions and recommendations are provided in the accompanying staff working document ([15]).

The analysis is structured along the triple planetary crisis of pollution, biodiversity loss and climate change ([16]). The aim is to assess whether the measures put forward by the Member States are sufficient to tackle the specific forms of pressure in their marine waters and to contribute to achieving GES. It also makes a set of key recommendations to guide further improvements. Some of the key messages and recommendations presented in the conclusions complement those presented in the WFD/FD report.

Only five Member States reported by the deadline of March 2022. A further nine reported with up to one year of delay and three reported with over a year of delay but still in time to be included in this assessment ([17]). In total, the Commission was able to assess the programmes of measures from 17 (out of 22) coastal Member States: Belgium, Germany, Ireland, Spain, Estonia, France, Italy, Cyprus, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovenia, Finland and Sweden. Delays and failures to report limited the Commission's ability to perform comprehensive regional coherence assessments.

The programmes of measures for the five remaining Member States (Bulgaria, Croatia, Denmark, Greece and Malta) will be published on the EEA WISE-Marine Platform ([18]). The Commission will also prepare country-specific assessments and recommendations, which will be shared with the Member States directly. The assessment of Member States' programmes will also feed into the 2024 Zero Pollution Monitoring and Outlook Report, the ongoing review of the MSFD ([19]), and other work to implement the EU's biodiversity and climate adaptation strategies.

1. STATE OF THE SEAS IN EUROPE

Approximately 40% of the EU's population lives in coastal areas. For these communities, the seas and ocean are directly linked to culture, identity and their sense of belonging ([20]).

Decades of overfishing, discharges of nutrients, contaminants and litter, intense maritime traffic and several other forms of anthropogenic pressure, combined with the growing impacts of climate change, have severely degraded the condition of marine ecosystems.

These increasing pressures jeopardise the benefits from Europe's seas and ocean that future generations are entitled to and will need for their lives, livelihoods and economies.

In 2018, Member States carried out the first assessment of the state of their marine waters under the MSFD, analysing the extent to which pressures from human activities are impacting marine life and ecosystems and progress towards achieving GES ([21]). This together with other sources of

([15]) Commission Staff Working Document accompanying the document Report from the Commission to the Council and the European Parliament on the Commission's assessment of the Member States' programmes of measures as updated under Article 17 of the Marine Strategy Framework Directive (2008/56/EC), SWD(2025) 1.
([16]) See What is the Triple Planetary Crisis? | UNFCCC.
([17]) On time – BE, IT, RO, SE, FI; up to 6 months delay – NL, DE, FR, PL, ES; up to 1 year delay – IE, PT, SI, EE; by 1 September 2023 – CY, LT, LV.
([18]) MSFD reports and assessments (europa.eu).
([19]) Protecting the marine environment – review of EU rules (europa.eu).
([20]) Marine (europa.eu).
([21]) See the Commission Communication, Commission Notice on recommendations per Member State and region on the 2018 updated reports for Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) 2022/C 118/01. See: EUR-Lex - 52022XC0314(01) - EN - EUR-Lex (europa.eu).

information gave the Commission a comprehensive picture of the state of the marine environment in 2020, the deadline for achieving GES.

Despite improvements in some areas, the conclusion then was clear: GES had not been achieved in all European marine waters ([22]). On the positive side, however, the ever-increasing trends in certain types of pressures across Europe's seas can still be reversed. In particular, they can be reversed by implementing effective measures under the MSFD, some of which build on other long-standing policy and legal frameworks (e.g. the Birds and Habitats Directive, Maritime Spatial Planning Directive, the Water Framework Directive and the common fisheries policy).

A striking example is the estimated 29% reduction of beach litter between 2015-2021 across all EU sea basins ([23]), with an even more significant 45% reduction in the Baltic Sea. Although most sea basins have yet to reach GES, this scale of reduction in 5 years is a success story, demonstrating that joint action works. There are a number of factors explaining this result, including very strong public support for action, high level political commitments to reverse the trend (e.g. the 2018 plastics strategy, the 2021 zero pollution action plan under the European Green Deal) and a solid legal basis for authorities to take action (along with the MSFD, the 2019 Single Use Plastic (SUP) Directive and the 2019 Port Reception Facilities Directive). The added value of the MSFD in this process is clear:

- the public and political campaigns to act against litter and plastic used MSFD data to back up their messages;
- the same data was used in the impact assessment and the adoption of the Single Use Plastics Directive, and helped raise public awareness;
- given that the 29% reduction took place even before the SUP Directive was in force, at least part can be attributed to the measures planned under the first MSFD implementation cycle;
- the 29% reduction can be assessed and communicated clearly due to the collective efforts of Member States, EU institutions and agencies ([24]) and civil society to collect and produce high quality, comparable data.

The analysis of the second programmes of measures for marine litter shows that Member States are taking further action to tackle the problem of beach litter: this should support the positive trend of continuous reductions (see Section 3.1).

For other topics, such as marine pollution or biodiversity loss, progress towards GES since 2018 will be assessed after the Member States report their third assessment of the state of marine waters in October 2024. In the meantime, the regional assessments produced by the four Regional Sea Conventions (RSCs) - i.e. the Helsinki ([25]), the OSPAR ([26]), the Barcelona ([27]) and the Bucharest Conventions ([28]) - provide a wealth of recent information about the state of EU seas.

([22]) Report from the Commission on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC), COM/2020/259 final, EUR-Lex - 52020DC0259 - EN - EUR-Lex (europa.eu).

([23]) European Commission, Joint Research Centre, MSFD Technical Group on Marine Litter, Hanke, G., Walvoort, D., Ruiz-Orejón, L. F., van Loon, W. M. G. M., Giorgetti, A., Molina-Jack, M. E., Vinci, M., *European Coastline Litter Trends 2015–2021 – Methodology development and trend results for the Marine Strategy Framework Directive,* Publications Office of the European Union, Luxembourg, 2024, JRC138907.

([24]) E.g. the European Environment Agency (EEA), the European Maritime Safety Agency (EMSA), and the European Marine Observation and Data Network (EMODnet).

([25]) See https://helcom.fi/.

([26]) See https://oap.ospar.org/en/.

([27]) See https://www.unep.org/unepmap/who-we-are/barcelona-convention-and-protocols?%2Ffr%2Fwho-we-are%2Fbarcelona-convention-and-protocols=.

([28]) See http://www.blacksea-commission.org/_convention.asp.

- *Baltic Sea Basin*

The third HELCOM holistic assessment ([29]) published in October 2023 provides a comprehensive overview of the state of the Baltic Sea's ecosystem from 2016-2021. It shows little to no improvement over that period, highlighting the need for continued and improved coordinated measures.

- **Pollution** pressures remain at a high level. Eutrophication is still a major problem, affecting different levels of the food web and contributing to ecosystem degradation. There are signs of improvements in some areas, particularly in the south-western sub-basins, but there has been an alarming further deterioration in central parts of the Baltic Sea. Pressure from hazardous substances remains high in most areas across the region, with high concentrations of certain contaminants ([30]) predominantly found in fish and mussels. There are indications of some improvements, with reductions seen in chemical concentrations in animals in a number of areas. For beach litter, 11 out of 16 sub-basins are above the threshold value of 20 litter items per 100 m of beach ([31]) and therefore are not in good environmental status. One of the main drivers of underwater noise is ship noise, where there are considerable variations in space (shipping lanes are the most affected) and time (ship noise is more widespread in winter than in summer).
- In terms of **biodiversity**, several marine species (including mammals and birds) and habitats are not in a good status across the whole Baltic Sea and at all levels of the food web. Three commercial fish stocks have declined since the last assessment and only one has improved. However, action on biodiversity conservation has increased and the region is on track to reach the global target to protect 30% of areas by 2030.
- The effects of **climate change** are already evident with the forecasted warming expected to soon lead to further harmful impacts, accelerating the urgent need to take measures to build ecosystem resilience and to mitigate the negative impacts.

Despite the overall conclusion that the Baltic Sea state has not improved, the assessment shows that, when well designed and effectively implemented, coordinated measures to reduce pressure do deliver tangible results. The progress report on the commitments taken under 'Our Baltic declaration', published for the second 'Our Baltic' conference in September 2023 ([32]), confirms that these are fundamental steps.

- *Mediterranean Sea Basin*

In December 2023, the Barcelona Convention produced a comprehensive assessment of the state of the Mediterranean Sea ([33]) based on data collected since the last quality status report in 2017.

([29]) See State of the Baltic Sea 2023 – HELCOM.
([30]) Polybrominated diphenyl ethers (PBDEs), Tributyltin (TBT), Mercury and Copper.
([31]) EU Member States agree on threshold value to keep Europe's beaches clean - European Commission (europa.eu).
([32]) https://op.europa.eu/en/publication-detail/-/publication/2e76afa1-5695-11ee-9220-01aa75ed71a1.
([33]) 2023 Mediterranean Quality Status Report, 23rd Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols, Portorož, Slovenia, 5-8 December 2023, UNEP/MED IG.26/Inf.10.

Although many topics could not be assessed due to uneven data availability, the available indicator assessments show a mixed picture.

- In terms of **pollution**, notably contaminants and eutrophication, although there are no clear messages applicable to the whole Mediterranean, detailed results are available for specific assessment areas and indicators ([34]). Only 16% of monitored Mediterranean beaches have achieved GES for litter. The Aegean-Levantine sub-region is the most affected by acute pollution events, in particular oil spills, reflecting the fact that it is one of the busiest Mediterranean maritime routes. The whole Mediterranean Sea seems to be in GES in terms of impulsive noise levels impacting selected cetaceans, but not for continuous noise, particularly in the Western Mediterranean and Aegean-Levantine Sea.
- In terms of **biodiversity**, the overexploitation of fish stocks has decreased over the past decade encouragingly, with action accelerating over the last two years, reaching its lowest level since 2003. This trend is consistent in all sub-regions ([35]). However, most commercial species are still overexploited, and fishing pressure is still double the level considered to be sustainable. Habitat destruction remains one of the most pervasive threats to the structure and functioning of Mediterranean coastal ecosystems. Down to depths of 1 000 m, the most extensive damage to seabed habitats is caused by bottom fishing using trawls and dredges. Many populations of seabird species have reached GES, with some exceptions. Most cetaceans are still listed as significantly threatened on the IUCN Red List Assessment, though the status of widespread species such as the common bottlenose and striped dolphins has improved since mid-2000.
- **Climate change** is one of the most critical challenges that the Mediterranean region faces. Over the last three decades, marine heatwaves have caused mass-mortality events across various marine species and critical losses for the seafood industry. The rise in seawater temperature is accelerating the spread of non-indigenous species. Hydrographic changes cause Mediterranean marine habitats to be increasingly endangered, with some at risk of complete extinction. The central and eastern Mediterranean areas are considered more vulnerable to climate change due to increased pressure from invasive species, higher water temperatures and less ocean circulation, which leads to lower levels of dissolved oxygen ([36]).

- *North-East Atlantic Basin*

The quality status report, released in June 2023 by OSPAR ([37]) and based on data spanning the 2009-2021 period, is the most authoritative assessment of the state of the whole North-East Atlantic Sea. Significant advances have been made to better understand and limit the negative impacts of human activity. Despite some improvements, trends indicate that biodiversity is declining and habitats are being degraded across many parts of the OSPAR maritime area.

- **Pollution** from a wide range of hazardous substances, excessive nutrients (leading to eutrophication) and marine litter have not been fully addressed. Reductions have been recorded in discharges of hazardous substances from the oil and gas sector and of radioactive substances from the nuclear sector. Concentrations of many of the most serious hazardous substances (e.g. PAHs and PCBs originating from run-offs, industrial discharges and old building sites, and

([34]) For instance, the Adriatic Sea sub-region is in GES for nitrogen, phosphorous and chlorophyll-a and 80% of sub-regions are in GES for metals, Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs) in sediments.
([35]) Communication from the Commission to the European Parliament and the Council, Sustainable fishing in the EU: state of play and orientations for 2025, Brussels, 7.6.2024, COM(2024) 235 final.
([36]) As above.
([37]) See https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/.

certain insecticides) have decreased substantially since the 1980s and 1990s. However, most sub-regions are in a poor status for hazardous substances in marine species, caused mainly by mercury and PCBs, while the situation is somewhat better for sediment pollution. There has been a significant reduction in the nutrients reaching the marine environment, particularly from agricultural sources, wastewater and industrial and atmospheric sources. However, pollution persists in river plumes and in some coastal areas. The results for marine litter are similarly mixed: the volume of marine litter remains high but it has fallen. The volume of litter on beaches is also falling but seafloor litter remains widespread, mainly litter from fisheries and plastic materials. Noise pollution is a growing concern.

- Despite undeniable progress in reducing overfishing since 2003 ([38]), the impacts of fisheries and other human activities on **biodiversity** are still deeply concerning. All assessments of the main components (marine birds, mammals, fish, benthic and pelagic habitats) and food webs show declines in biodiversity, despite progress made in identifying and addressing pressures. In particular, the condition of marine birds has deteriorated since the last assessment in 2017.
- **Climate change** and ocean acidification are driving major changes that imperil much of the North-East Atlantic's marine biodiversity. Due also to other ongoing forms of human pressures, overall, marine ecosystems are losing resilience to climate change.

The conclusions of the Quality Status Report make two findings clear:

1) additional measures are needed to change the current trajectory;
2) the measures taken so far need to be implemented more effectively.

- *Black Sea Basin*

No regional assessment is available for the Black Sea but there is some data available, mainly covering the 2016-2021 period, from the EU-funded EMBLAS project ([39]), supplemented by analyses carried out by the Commission's Joint Research Centre.

- On **pollution**, observations confirm that all Black Sea areas contain marine litter, mostly plastic and microplastic litter. The data indicate that Black Sea beaches are the most littered in Europe and have the highest rate of single use plastics (652 litter items per 100 m). The sea remains contaminated by heavy metals, PAHs and certain pesticides and the PFOS concentration exceeds the safe limit. Indeed a 2021 scientific survey revealed that the cumulative pollution of the Black Sea with chemical contaminants was approximately 3 to 8 times higher compared to the Mediterranean Sea and 2 to 7 times higher than in the North-East Atlantic ([40]). Some coastal regions appear to be in GES for eutrophication, but most of the central eastern deep-water parts were not in GES in 2019 due to phytoplankton bloom and high concentrations of pollutants.
- On **biodiversity**, the biomass levels of several fish and shellfish species has clearly fallen between 1995 and 2021, some quite dramatically (e.g. whiting, picked dogfish, anchovy or the gastropod *Rapana venosa*). Coastal and shelf waters were assessed to be in GES for phytoplankton biodiversity, but open waters were not. In addition, environmental conditions deteriorated between 2016 and 2019 in the 'Zernov's Phyllophora Field' marine reserve, which

([38]) "In 2003, average fishing mortality in the North-East Atlantic was 53% above the FMSY target. The latest assessment shows that the mortality rate has progressively fallen to reach 42% below the FMSY in 2022" Commission Communication on Sustainable fishing in the EU: state of play and orientations for 2025, as above.
([39]) Slobodnik, J., Arabidze, M., Mgeladze, M., Korshenko, A., Mikaelyan, A., Komorin, V., Minicheva, G., 2020, EMBLAS Final Scientific Report– Joint Black Sea Surveys 2016-2019.
([40]) 2021 scientific survey of the North-East Atlantic, Mediterranean and Black seas titled "The Cruise of Three European Seas carried out in the framework of the EU4EMBLAS project with JRC support.

is the Black Sea's largest marine protected area located in Ukrainian waters. Recent surveys have also noted possible invasive species migrating into the Black Sea ([41]).

- On **climate change**, scenarios show an increase in water temperature and other changes that will alter the transport and dispersion of nutrients and pollutants in the Black Sea ([42]) and increase pollutant accumulation in the eastern basin ([43]).

The environmental effects of Russia's war of aggression towards Ukraine have had far-reaching and transboundary impacts on the Black Sea. These impacts stem from mines and other explosives, oil spills and emissions of toxic substances, pollutants, and plastics due to the destruction of ports and ships, as well as pollution carried by rivers into the sea. Although long-term monitoring is very difficult because of the ongoing hostilities, there is clear evidence that these damages have negative impacts on biodiversity, habitats and species including marine mammals and fish stocks.

The breach of the Kakhovka Dam in June 2023, in particular, has had unprecedented environmental consequences for the South of Ukraine, extending to the larger Black Sea region. All chemical pollutants were at significantly higher concentrations at all sampling points after the dam destruction in 2023 compared to 2020. In addition, the 2000-fold increase in blue-green algae phytoplankton led to the death of 40% of one of the Black Sea mussel populations ([44]). Although recovery is already happening, the long-term impacts of this pollution on human and ecosystem health will need to be further investigated.

2. TACKLING THE TRIPLE PLANETARY CRISIS

Since the marine waters in the European Union did not achieve good environmental status (GES) in 2020, Member States were expected to update their first MSFD programmes of measures to further tackle pressures and achieve GES as soon as possible.

In their update, the 17 Member States assessed reported 2046 measures covering all marine regions, descriptors and pressures ([45]). Of these, only a third are new measures specifically included in this second update, the vast majority merely extending the measures reported previously, with some modifications. Since GES was not achieved by 2020, more new measures could have been expected.

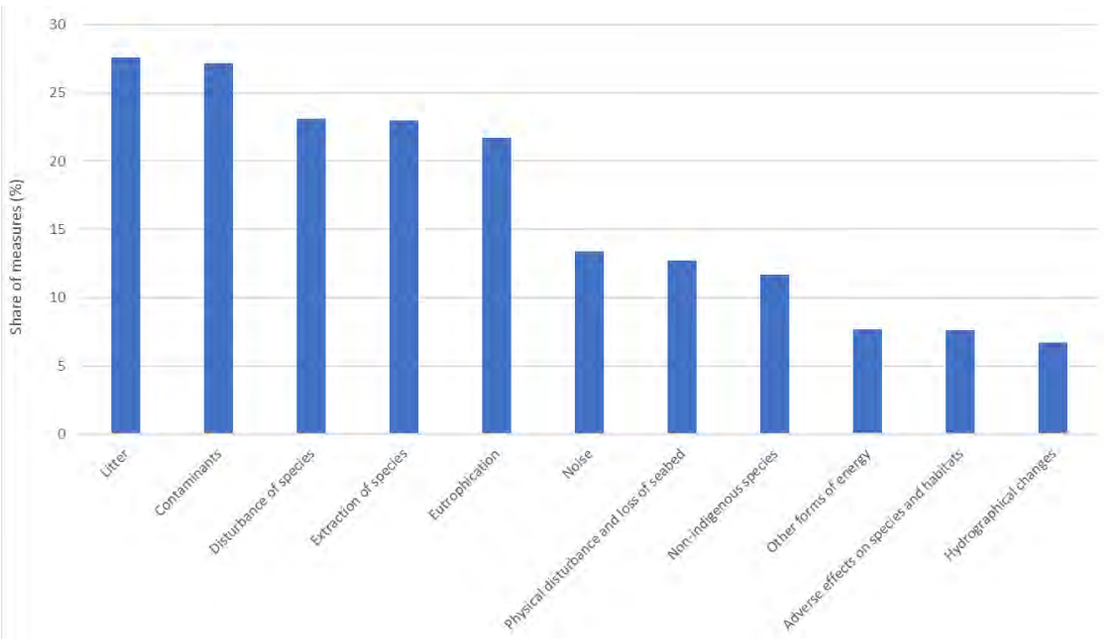
Almost half of the measures reported are designed to achieve or maintain GES specifically under the MSFD. This is a substantial increase since the first programmes of measures, where only a quarter of the measures were 'MSFD-specific' ([46]). The remaining measures stem from requirements under other pieces of EU law, RSCs, international agreements or national legislation.

([41]) 2021 scientific survey of the North-East Atlantic, Mediterranean and Black seas.
([42]) Miladinova, Svetla, et al., 2020, 'Seasonal and Inter-Annual Variability of the Phytoplankton Dynamics in the Black Sea Inner Basin' Oceans 1, No 4: 251-273. https://doi.org/10.3390/oceans1040018; Macias, D., et al., 2022, Water/marine zero pollution outlook: a forward-looking, model-based analysis of water pollution in the EU. Luxembourg. https://doi.org/10.2760/681817.
([43]) Miladinova, S., et. al., E. 2020 'Identifying distribution and accumulation patterns of floating marine debris in the Black Sea', Marine Pollution Bulletin, 153, 110964, doi:10.1016/j.marpolbul.2020.110964; Macias, D., et al., 2022. as above.
([44]) Consequences of the Kakhovka hydropower plant dike explosion for the Black Sea: new data – EMBLAS project
([45]) For an in-depth analysis of the information on the updated programmes of measures that has been electronically reported by the 17 Member States, see: European Commission, Joint Research Centre: Louropoulou, E., Alonso Aller, E., Cardoso, A.C., Carravieri, A., Druon, J., Magliozzi, C., Martini, E., Mendes, C., Palma, M., Piroddi, C., Ruiz-Orejón, L.F., Zupan, M. and Hanke, G., Programmes of Measures under the Marine Strategy Framework Directive to achieve or maintain Good Environmental Status, Publications Office of the European Union, Luxembourg, 2024, JRC139180.
([46]) Report from the Commission to the European Parliament and the Council assessing Member States' programmes of measures under the Marine Strategy Framework Directive, Brussels, 31.7.2018 COM(2018) 562 final.

In the second programmes of measures, almost 50% of the measures are designed to *directly* prevent further pressures, reduce existing pressures or restore species or habitats. Over 35% of the measures are designed to *indirectly* contribute to those objectives (e.g. through governance mechanisms, financial incentives or awareness campaigns). Measures linked to knowledge improvement make up approximately 15% of the total.

The measures reported cover all the different types of pressures relevant to the EU marine environment ([47]). Litter and contaminants are the most frequently tackled pressures, each the subject of almost 30% of the measures. Over 20% of the measures tackle disturbance and extraction of species and eutrophication. Over 10% tackle noise, seabed disturbance and non-indigenous species and less than 10% of the measures tackle other forms of energy, adverse effects on species and habitats and hydrographical changes (Figure 1).

Figure 1. Share of measures in the second programmes of measures tackling pressures on marine ecosystems



However, this statistical analysis does not give an insight into how effective the proposed measures are. Despite many measures being taken to tackle chemical and nutrient contamination, Member States action still falls short of what is needed to substantially reduce pollution and ultimately to achieve good environmental status.

TOWARDS ZERO POLLUTION IN THE SEAS AND OCEAN

Reducing water pollution is a key dimension of the EU Green Deal and the zero pollution action plan. Pollution is one of the five main threats to biodiversity ([48]).

([47]) Measures also cover all the descriptors of Good Environmental Status of Annex I to the MSFD. Over 30% of measures are related to biodiversity (Descriptor 1), 28% to seafloor integrity (Descriptor 6), 24% to contaminants (Descriptor 8) and 22% to marine litter (Descriptor 10). The descriptors least frequently associated to measures are hydrographical conditions (Descriptor 7 – 8%), contaminants in seafood (Descriptor 9 – 9%), non-indigenous species (Descriptor 2) and underwater noise (Descriptor 11) at 10% each. Biodiversity descriptors (1-4-6) are best covered because any measure taken to reduce a certain category of pressure, for instance eutrophication or contaminants, will also have an impact on the state of marine biodiversity.

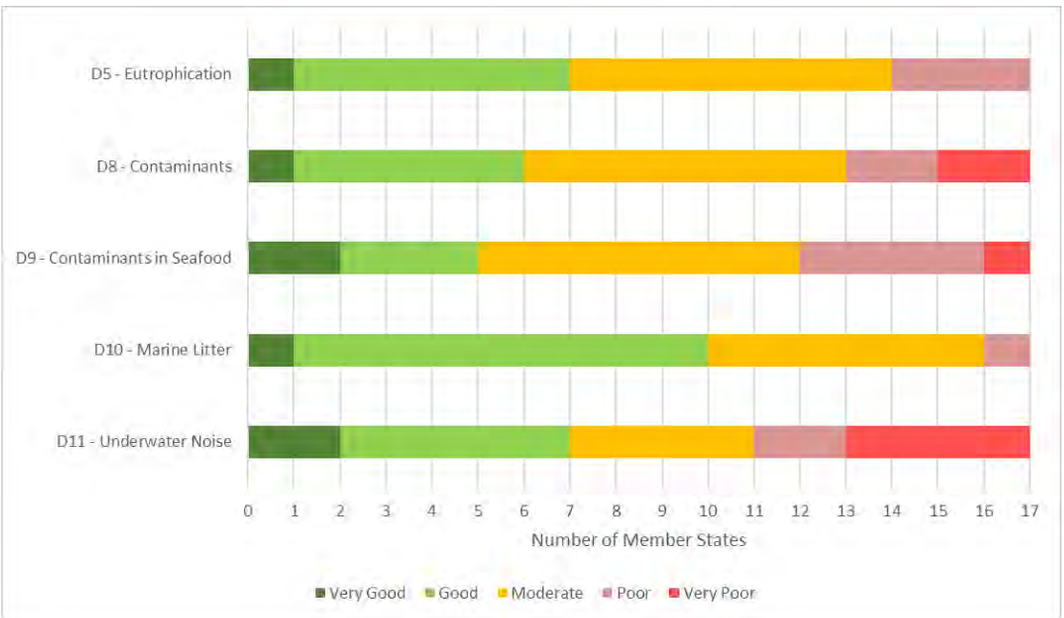
([48]) Report from the Commission, First 'zero pollution' monitoring and outlook, 'Pathways towards cleaner air, water and soil for Europe', COM(2022) 674 final, Brussels, 8.12.2022.

Based on the data reported by the Member States under Article 8 of the MSFD in 2018 ([49]), 80% of the EU's sea area failed to meet GES for contamination by ubiquitous, persistent, bio-accumulative and toxic substances, such as mercury. 87% failed to achieve GES for eutrophication, 90% for litter and 97% for continuous underwater noise.

Over the past few years, the Commission has tabled several proposals to tackle water pollution, most recently to revise the Urban Wastewater Treatment Directive, the Industrial Emissions Directive and to update the list of water pollutants under the Water Framework Directive. The adoption in 2020 and 2022 of threshold values under the MSFD for litter ([50]) and noise ([51]) is also an important step towards better management of ocean pollution.

This section covers the four major categories of pollution affecting the marine environment: marine litter (Descriptor 10), eutrophication (Descriptor 5), harmful contaminants (Descriptors 8 & 9) and underwater noise (Descriptor 11).

Figure 2. Adequacy of Member States' second programmes of measures to tackle pollution



On average, Member States' measures only partly tackle the issues needed to reduce pollution (Figure 2). While the measures put in place to reduce marine litter go in the right direction, the measures to tackle eutrophication, chemical contamination and underwater noise are still insufficient.

Marine litter (Descriptor 10)

Overall, the quality of the measures to tackle marine litter improved between the two cycles.

An analysis confirms the positive trend seen over the past few years on action to tackle marine litter. 22% of all the measures reported by Member States are related to Descriptor 10 – marine litter – and a quarter are additional to existing legal obligations.

The measures cover the main sources of litter input, starting with activities related to sewage from urban areas and other land-based sources (e.g. industry and agriculture). Riverine input is also

([49]) WISE Marine: https://water.europa.eu/marine.
([50]) EU Member States agree on threshold value to keep Europe's beaches clean - European Commission (europa.eu).
([51]) Zero pollution and Biodiversity: First ever EU-wide limits for underwater noise - European Commission (europa.eu).

identified as one of the main sources of pollution. Measures also cover sea-based sources. Several measures directly tackle litter from fisheries (including ghost nets), including clean-up actions and actions to prevent further input (based on the requirements of the Port Reception Facilities Directive and the Single Use Plastics Directive). Shipping, recreational activities and tourism are also major sources of litter, and aquaculture to a lesser extent. Litter from maritime transport is mainly tackled by initiatives related to the IMO, MARPOL and the Port Reception Facilities Directive.

Only a few Member States have identified marine pollution hotspots, despite the Commission's recommendation to do so in its 2018 assessment ([52]). Gaps remain in tackling micro-litter, litter on the seafloor and in the water column and impacts on marine life. Although Mediterranean Member States have clear targets related to litter impacts on *Caretta caretta* turtles, none have yet reported measures to directly tackle the problem. Almost all Member States recognise the value of regional cooperation and the work done in the context of the RSCs.

Good examples

Some Member States have taken specific measures to tackle micro-litter, including developing containment systems, purification plants or treatment of stormwater and wastewater specifically targeting micro-litter and microplastics.

Eutrophication and contaminants (Descriptors 5, 8 and 9)

Overall, there has been progress in developing measures to further reduce both organic and chemical pollution, but more action is needed.

Action to combat eutrophication and contamination by hazardous substances remains insufficient ([53]). Member States have included many measures related to Descriptor 8 – contaminants (24%), Descriptor 5 – eutrophication (18%) and, to a lesser extent, Descriptor 9 – contaminants in seafood (9%). They often link these measures to the updated RBMPs, though make a limited assessment of their effectiveness in achieving GES.

There is less consistent action planned to tackle pollution from airborne emissions, despite a wealth of legislation on air quality and emissions, notably under EU law governing the energy, industry and transport sectors, the Ambient Air Quality and the National Emission Reduction Commitments Directives. However, Member States have included measures to further regulate contamination from shipping linked to implementation of MARPOL or IMO agreements (e.g. environmentally friendly anti-fouling, emission controls, cleaner ship concepts), with expected positive impacts, notably in offshore areas.

Member States still find it challenging to tackle pollution from emerging substances (e.g. pharmaceuticals) and to remedy the legacy impacts from persistent contaminants (e.g. mercury). However, there are good practices to tackle contamination from sea-based sources (e.g. managing contaminants from wrecks, phasing out the use of lead in fishing gear, tracking and recovering lost containers) and eutrophication (e.g. by using recycled manure in biogas production). Finally, as EU rules on maximum levels of contaminants in foodstuffs were updated in 2023 to cover a broader

([52]) Commission staff working document accompanying the document *Report from the Commission to the European Parliament and the Council assessing Member States' programmes of measures under the Marine Strategy Framework Directive*, Brussels, SWD(2018) 393 final, 31.7.2018, p33.
([53]) On average, measures for Descriptors 5, 8 and 9 are considered to be moderately adequate.

range of heavy metals and persistent organic substances ([54]), achieving GES for seafood contamination is likely to require additional measures in future.

Good examples

Healthy marine habitats can play a crucial role in reducing the adverse effects of eutrophication. Some Member States are increasingly using nature-based restoration measures for habitats such as blue mussel beds, seagrass beds and saltmarshes to tackle eutrophication.

Underwater noise (Descriptor 11)

Overall, Member States' measures to reduce underwater noise have improved, but they are still focused on knowledge gathering rather than on reducing pressures.

Due to the lack of legal frameworks covering underwater noise, the MSFD has generated many new measures to tackle this form of pressure but they are still insufficient to reach GES and the set targets ([55]), both in quantity (only 10% of all measures) and in quality.

Compared to the first programmes, the measures give a better coverage of sources and types of pressure, but remain mostly focused on knowledge gathering rather than on having a direct impact on reducing the pressure.

To improve their knowledge on underwater noise, Member States mainly base their action on regional level frameworks and on EU-funded projects. Only a few Member States have designed specific measures based on the outcomes of these projects, such as setting speed limits near sensitive areas or during sensitive times. The most targeted measures tackle offshore and coastal infrastructure construction, either by limiting noise levels or by including underwater noise in environmental impact assessment studies. Setting threshold values for maximum levels of impulsive and continuous noise in October 2022 should support the design of more and better measures in the next cycle.

Other forms of energy (e.g. electromagnetic, light and heat) are still not well addressed, except for a few ad hoc measures looking into the potential effects of electromagnetic fields on vulnerable habitats or monitoring light pollution.

Good example

One Member State optimises shipping approach routes during the construction or maintenance of offshore wind farms or other offshore infrastructure to avoid high levels of continuous noise in vulnerable areas functioning as biodiversity hotspots.

BRINGING MARINE NATURE BACK INTO OUR LIVES

Europe's seas host a wide and highly diverse range of coastal and marine ecosystems with a great variety of habitats and species ([56]). If in good condition, they provide our societies with vital services, including food, energy, clean air and climate change mitigation ([57]). Pressures that impact

([54]) Commission Regulation (EU) 2023/915 of 25 April 2023 on maximum levels for certain contaminants in food and repealing Regulation (EC) No 1881/2006.
([55]) On average, measures for Descriptor 11 are considered to have a moderate level of adequacy.
([56]) State of Europe's seas – European Environment Agency (europa.eu).
([57]) Europe's marine biodiversity remains under pressure – European Environment Agency (europa.eu).

marine biodiversity and ecosystems weaken the planet's ability to function healthily and to provide the essential services we rely on for survival and prosperity. As demands on the ocean increase, ensuring the continued availability of these services becomes even more crucial.

The EU has stepped up its commitment to protect marine biodiversity. The EU biodiversity strategy for 2030 ([58]) requires to legally and effectively protect 30% of our seas, a third of which under strict protection. Through its Mission "Restore our Ocean and Waters by 2030" ([59]), the EU is aiming to bring concrete solutions to the challenges faced by our seas and ocean today, by putting research and innovation into a new role, combined with new forms of governance and collaboration, as well as by engaging citizens. At global level, these commitments are echoed by the adoption of two historic agreements: the 2022 Global Biodiversity Framework at the Convention on Biological Diversity COP 15 ([60]) and the 2023 Treaty on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Treaty) ([61]).

The 2023 adoption of the marine action plan ([62]) also contributes to the work to meet these objectives by calling on Member States to take action to reconcile fishing with environmental protection objectives, notably by improving gear selectivity, tackling bycatch of sensitive species, protecting the seabed and action to support the transition and knowledge exchange.

The threshold values set under the MSFD in 2023 for seabed loss and damage ([63]) are also an important step towards better management of ocean natural resources.

Nonetheless, GES is far from being achieved for the biodiversity descriptors. For example, only 3% of cetaceans (such as dolphins and porpoise), only 15% of whales and seabed habitats and just 29% of pelagic-feeding birds in European marine waters were assessed by Member States as being in GES at the start of the Directive's second cycle of implementation.

This section covers the measures taken to protect species, habitats and food webs against non-pollution forms of pressure such as disturbance, extraction and non-indigenous species. It is linked to Descriptors 1 (biodiversity), 2 (non-indigenous species), 3 (commercial fish and shellfish), 4 (food webs), 6 (seafloor integrity) and 7 (hydrographical conditions).

Overall, progress in designing and implementing effective MSFD measures to protect and restore biodiversity has been rather limited since the first programmes of measures (Figure 3). However, the measures taken to protect the seafloor have improved, mainly by better tackling mobile bottom-contact fishing, and progress has also been made in tackling non-indigenous species and changes to hydrographical conditions.

The lack of a comprehensive gap analysis has limited the Commission's assessment of the biodiversity measures. Strong gap analyses give a better understanding of how existing measures contribute to achieving GES and what additional measures are needed.

([58]) Communication from the Commission, EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM(2020) 380 final

([59]) https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters_en

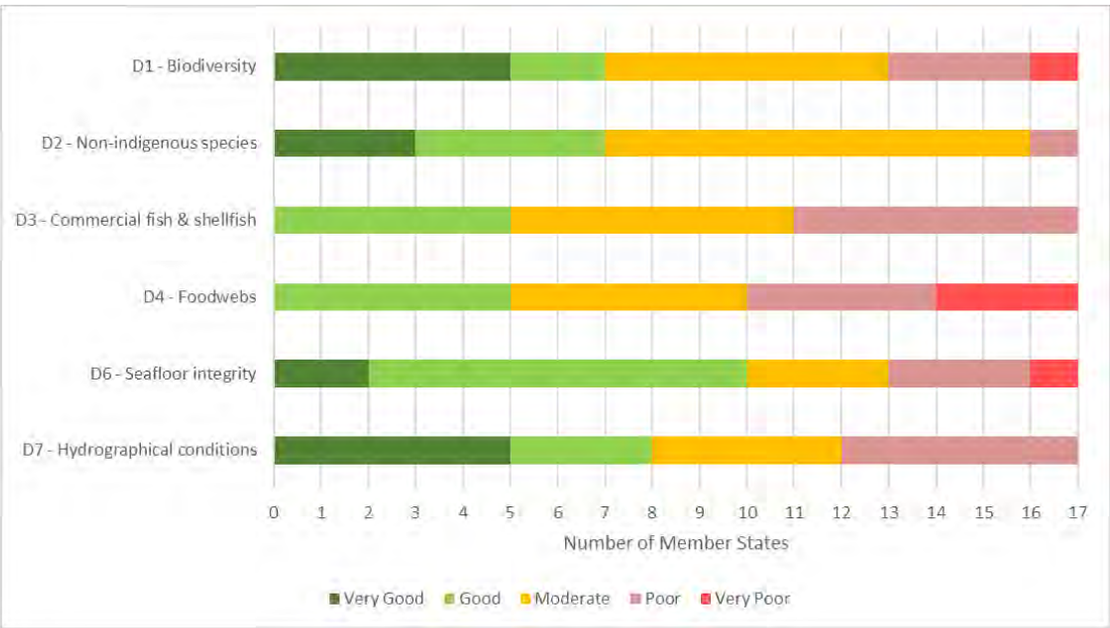
([60])Kunming-Montreal Global Biodiversity Framework (cbd.int).

([61]) Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction | (un.org).

([62]) Communication from the Commission, EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries, COM(2023) 102 final

([63]) EU Green Week: first ever EU-wide criteria for seabed protection - European Commission (europa.eu)

Figure 3. Adequacy of Member States' second programmes of measures to tackle biodiversity issues



General measures for biodiversity (Descriptors 1, 4 and 6)

Overall, there has been only limited progress in the measures for biodiversity.

Most if not all of the measures taken by Member States are likely to have an effect on the state of marine biodiversity, which is why the biodiversity descriptors are generally well covered by the programmes of measures ([64]). Measures to reduce pressures ([65]) will have direct positive effects on species and habitats and indirectly on the whole ecosystem and food webs. Additional measures can be taken specifically for the purpose of protecting and restoring biodiversity.

The most common measure is to designate marine protected areas (MPAs), either to protect specific habitats and species (often under the regime of the Birds and Habitats Directives) or to restore certain ecosystem functions (e.g. seafloor integrity, food web health). The aim of MPAs is often to reduce levels of pollution, extraction or disturbance by regulating activities that have a negative impact on species and habitats. These can include tourism activities (recreational boating and water sports), fishing, particularly with bottom-trawling gear and polluting activities either within or in the surrounding area. MPAs can have a significant impact on pressures, depending on their size, the degree of human activity restrictions and on whether effective management measures are in place.

The information provided by Member States often contain scant detail on the type of management measures and the size and the location of the MPAs, making it difficult to ascertain how they contribute to the targets of the EU biodiversity strategy.

([64]) 31% of all measures are linked to Descriptor 1 – biodiversity, which is the highest share among all descriptors; 28% are linked to Descriptor 6 – seafloor integrity, and 19% to Descriptor 4 – food webs.
([65]) Such as those designed for the purpose of the MSFD pressure descriptors.

Good example

Currently, MPAs cover only 12% of European waters; they range from 'multi-use MPAs', where most human activities are allowed and the level of effective protection is low, to 'strictly protected' MPAs which allow very few, if any, human activities. Where active restoration of habitats is planned such as reef reconstruction or the recovery of oyster beds, Member States also restrict or even ban human activities that are damaging to *these* habitats.

Measures for species, including commercial species (Descriptors 1 and 3)

Overall, there has been only limited progress in the measures planned to tackle species, including commercial fish and shellfish species.

Species-specific measures tend to focus on fish, marine mammals and seabirds, while measures for cephalopods (e.g. octopus and squids), marine reptiles (e.g. turtles) and pelagic species (e.g. plankton) are rarer. The activity reported by Member States as causing most pressure on marine species, especially from incidental bycatch for seabirds and mammals, is commercial fishing. Measures to reduce bycatch focus on adapting fishing gear, training fishers to improve recording and avoidance of bycatch incidents, and increased monitoring of fishing activities. These measures typically fall in the scope of the Technical Measures Regulation ([66]), which supports the objective of the MSFD in terms of species and habitats protection. Some Member States also regulate bycatch inside MPAs by making use of the scope under the common fisheries policy to propose joint recommendations with neighbouring countries for spatial fisheries measures ([67]).

Measures for turtles are rare, except for a few direct measures involving the training of fishers to avoid bycatch and the risk of vessel collision. Measures for cephalopods are non-existent; they are commonly bundled together with fish species.

Commercial and non-commercial fish and shellfish are covered by measures to reduce fishing pressure. Most measures are linked to the CFP to ensure that populations are fished at levels that are sustainable over the long term. Some Member States also cover nationally managed local/in-shore stocks. To some extent, they cover recreational fishing, but not sufficiently. Half of the Member States have also reported measures to tackle the requirement for healthy age and size distribution of fish populations ([68]), for example by reducing the catch of juvenile fish or updating regulations on mesh sizes. Obstacles in the migratory corridors of fish are also reported as major threats to the health of fish populations.

Good example

One country has taken a measure to reduce *blockages* to fish migratory corridors by using acoustic monitoring, removing old barriers or re-opening migratory pathways and stimulating fish populations in estuarine/coastal areas.

([66]) The Technical Measures Regulation (EU) 2019/1241 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures.
([67]) Common Fisheries Policy Regulation (EU) 1380/2013, Article 11 on 'Conservation measures necessary for compliance with obligations under Union environmental legislation'.
([68]) As per criterion D3C3 of Commission Decision (EU) 2017/848.

Measures for habitats (Descriptors 1 and 6)

Overall, some progress has been made on measures for seabed habitats, in particular by reducing the seabed harm caused by mobile bottom-contact fishing methods, but action on water column habitats remains overlooked.

By nature, all forms of biological, physical, and substance input pressures have an impact on seabed habitats and seafloor integrity, whether directly or indirectly. In addition to all the measures taken under other descriptors, Member States have taken measures clearly focused on the physical preservation of the seafloor, including reducing pressure from human activities on seabed habitats, designating seabed-focused MPAs and actively restoring habitats and the biological communities associated with them (e.g. restoring oyster reefs and Posidonia meadows and planting *Zostera* beds).

Most Member States identified mobile bottom-contact fishing as the main threat to the health of seabed habitats. Some have adopted measures to reduce its harmful impacts, either covering large areas or specifically for vulnerable habitats.

The Member States also regulate other activities causing physical pressure on the seabed, such as anchoring in the Mediterranean, which is a particular threat to Posidonia meadows, lost fishing gear and sand dredging. Despite growing pressure from offshore wind energy infrastructure, including cables, only a few Member States tackle the pressure caused by wind energy installation. Measures include mapping vulnerable seabed habitat types, for example. The adoption in March 2023 of EU-wide threshold values for the maximum extent of adverse effects and loss on seabed habitats should support the design of even more effective measures for seafloor integrity in the next cycle.

Water column habitats are still largely overlooked under the biodiversity descriptors but they are covered by measures to reduce pollution levels in the water column.

Good example

Reducing the trawl-swept area in national waters and promoting lower impact and more selective gear for the whole fleet are examples of the measures taken by some Member States to help protect seabed habitats outside of MPAs.

Measures for food webs (Descriptor 4)

Overall, no noticeable progress has been made on measures for marine food webs; action on species and seabed integrity would drive improvements to food webs.

The MSFD requires that marine food webs are healthy, meaning that all living organisms in the given marine environment are in balance and capable of achieving long-term abundance and reproductive capacity. Human activities can affect the balance of this intricate relationship, for example by removing too many forage fish and making it more difficult for their predators to find food.

There are very few examples of practical direct measures taken by Member States to safeguard the health of marine food webs. Most measures linked to food webs aim to protect biodiversity in general, such as designating or expanding MPAs, or species-specific measures such as preventing bycatch. While these measures are important for maintaining populations of certain species, and thus the local food web, they have only an indirect impact on the overall food web health.

Good example

Examples of measures taken by some Member States for food webs include restricting fishing of a certain trophic group (e.g. of all predatory or forage fish) or of certain commercial species that play a particularly important role in the food web, or reducing fishing levels overall.

Measures to reduce other non-pollution pressures on biodiversity (Descriptors 2 and 7)

Overall, progress has been made in identifying suitable measures to tackle non-indigenous species. However, few Member States have made progress in tackling changes to hydrographical conditions.

Most of the measures to reduce the threats to biodiversity stemming from non-indigenous species relate to implementation of the IMO Ballast Water Convention, as shipping is widely recognised by Member States as the main introduction pathway. Aquaculture is also identified as a growing introduction pathway, and some Member States have taken early detection measures by monitoring aquaculture hotspots. Recreational boating and angling are also increasingly covered by preventive measures.

Permanent changes of hydrographical conditions, such as water temperature or salinity, can also impact marine biodiversity by disturbing water column habitats and the environmental conditions in which marine species live, feed and reproduce. The main direct measures taken by Member States to prevent some of these changes, in particular in coastal areas, are linked to the WFD RBMPs. They include, for instance, controlling the freshwater and sediment flow from rivers into the sea. Indirect measures include ensuring that strategic environmental assessments and environmental impact assessments cover these impacts or using maritime spatial planning to better plan and control cumulative effects potentially leading to alterations of hydrographical conditions. Climate change is also significantly affecting hydrographical conditions (see details below).

Good example

Innovative measures taken by certain Member States include developing a forward-looking vision to develop large-scale activities (e.g. offshore energy production sites and aquaculture). Based on these future scenarios, spatial planning of human activities at sea can be designed to manage future cumulative impacts and ensure they do not prevent the achievement of GES.

TACKLING THE CLIMATE CRISIS

2023 was the warmest year ever recorded in many parts of the northern hemisphere ([69]). As a result, most basins in the Atlantic Ocean have been warmer than average, especially in Europe ([70]). The European Climate Risk Assessment report ([71]) confirms that all European seas are heavily affected by climate risks and anthropogenic pressure.

The latest Intergovernmental Panel on Climate Change report on the ocean and cryosphere in a changing climate ([72]) indicates that the ocean is warming, acidifying and suffering from

([69]) State of the Global Climate 2023.
([70]) The European heatwave of July 2023 in a longer-term context | Copernicus.
([71]) European Climate Risk Assessment – European Environment Agency (europa.eu).
([72]) AR6 Synthesis Report: Climate Change 2023 – IPCC.

deoxygenation. The growing trajectory of this 'deadly trio' will reduce the ocean's ability to absorb carbon dioxide and preserve life on the planet.

In a recent ruling, the International Tribunal for the Law of the Sea under the UN Convention on the Law of the Sea clarified that '*anthropogenic GHG emissions into the atmosphere constitute pollution of the marine environment within the meaning of Article 1, paragraph 1, subparagraph 4 of the UN Convention' ([73])*. With this ruling, the Tribunal directly links countries' efforts to reduce greenhouse gas emissions in the atmosphere (and thus fight climate change) with action to tackle pollution of the marine environment, in the UNCLOS context. This decision should also be read in the MSFD context, requiring Member States to tackle pollution of the marine environment.

It is therefore necessary to act and take measures to support the ocean-climate nexus. In particular, the ocean can help mitigate climate change by:

- Preserving the capacity of the oceans to act as carbon sinks. Healthy coastal and marine ecosystems ensure the oceans maintain their capacity to store carbon.
- Reducing greenhouse gases emissions by developing ocean renewable energy and greening blue economy sectors.

Addressing climate change through the MSFD

Overall, although the MSFD does not directly tackle it, many Member States have taken climate adaptation measures, e.g. supporting coastal communities, and some have taken climate mitigation measures, e.g. restoring blue carbon ecosystems.

To date, climate change is neither explicitly covered by an MSFD descriptor nor listed as a form of pressure. Climate change is however mentioned in the Directive and the holistic marine strategies provide a good framework to monitor climate change impacts and explore climate change mitigation. This approach was confirmed by the assessment made for the previous cycle, where Member States highlighted that the impacts caused by climate change and ocean acidification are important transboundary issues tackled under MSFD monitoring programmes ([74]).

As climate change is a concern for all marine regions and a growing pressure on the marine environment, several Member States now consider it a frontline issue: 4% of all measures (84 measures from 15 Member States) are directly related to climate change.

Most climate-related measures concern adaptation or resilience, i.e. reducing climate change impacts or supporting communities in addressing and recovering from future deteriorations. One third is related to mitigation, i.e. reducing and preventing greenhouse gas emissions, including action to restore blue carbon ecosystems.

Many important measures stem from work under the RSCs, others from the Member States' national energy and climate plans or national climate adaptation strategies.

Good example

By quantifying the carbon sequestered by seagrass meadows and macroalgae forests, some Member States identify carbon hotspots in their waters and ensure that economic activities do not threaten them or, on the contrary, contribute to their restoration.

([73]) https://www.itlos.org/fileadmin/itlos/documents/press_releases_english/PR_350_EN.pdf.
([74]) Report on the implementation of the Marine Strategy Framework Directive (europa.eu).

3. ENSURING SOCIO-ECONOMIC SOUNDNESS

Overall, Member States now have a greater understanding of the socio-economic impacts of MSFD measures. Still, fewer than half indicate the level of investment needed and very few look into the social acceptability of the measures proposed.

Almost all Member States performed a cost-benefit and/or a cost-effectiveness analysis on their measures, and some followed up with a categorisation of the least cost-effective measures. Only a few explained how these analyses influenced the selection of measures, for instance by prioritising certain measures over others. A few Member States from the Baltic region made a quantitative comparison between the costs of their programmes of measures and the benefits (achieved or potential) of improving the state of the marine environment.

Fishing and shipping are the two activities/sectors reported as being most impacted by MSFD measures. Only two Member States also looked at how their programmes of measures would affect social issues and human well-being. One Member State investigated whether each individual new measure could be expected to have a positive, negative or no impact on local communities, traditions, cultural heritage, employment and health.

The proposed MSFD measures covering the 2022-2027 period have been estimated at an average cost of EUR 724 per km^2 of marine area per year. Based on this data, the cost of MSFD measures for all EU marine waters can be estimated at EUR 5.8 billion per year ([75]). Based on Member States' reporting of the share of their measures that are specific to the MSFD (42%), the cost of MSFD-specific measures for all EU marine waters is estimated at EUR 2.4 billion per year.

Almost all Member States mobilise a mix of national and EU funds, with some Member States listing EU funds for 50-80% of their measures. EU funds most often mentioned are EMFF/EMFAF, LIFE and Horizon Europe. Over half of the Member States also mention mobilising private finance, either as costs to the private sector to follow the measures that are implemented (e.g. as a capital investment) or as funding provided by environmental foundations to implement the MSFD measures.

4. GOVERNANCE AND REGIONAL COOPERATION

Designing a suitable programme under the MSFD requires not only identifying the right measures to help achieve GES but also putting in place a governance framework to support their implementation.

The Commission assessed four main aspects of the Member States' governance mechanisms: involving the public, coordinating across related policy fields, regional cooperation and likelihood of implementation.

Member States have put governance mechanisms in place to support implementation of the programme of measures but coordination with other authorities and with neighbouring Member States is not always sufficient. Since the first programmes of measures, more Member States have expressed a clear commitment to the full implementation of their programmes of measures.

([75]) Total km2 of marine waters of 22 EU Member States (7 958 556) * average cost of measures per km2 (724) = EUR 5 764 104 242.96. Calculations are included in EUR. See more detailed calculations in the SWD accompanying this communication.

The obstacles identified by Member States include financing and issues related to implementation at national level, reported by just a few Member States. Member States did not report any obstacles to implementation for almost half of their measures (48%) ([76]).

Involving the public

Overall, processes for involving the public seem adequate but the extent to which they use feedback to amend the programmes of measures is much less clear.

Only two Member States did not mention conducting public consultations on their programmes of measures. Of the other 15, a quarter reported only very limited information on how they take on board the input from the public in selecting and designing the measures. The level of engagement was higher where the information about the consultation was provided using both traditional and social media.

Feedback could be provided through different means including direct contact with the public through workshops, seminars and stakeholder meetings in addition to online consultations. Only four Member States reported setting aside time to handle public feedback using a comprehensive methodology and amending their programmes where appropriate.

Cooperation with other authorities, policies and Member States

Overall, all countries cooperate across policy areas and with other authorities, although it is not always clear what the outcome of this cooperation is. Some countries cooperate more closely with WFD and MSP authorities, including by taking a joint approach to the design of measures. Regional cooperation plays an important role in the development of Member States's programmes of measures in some regions, but the level of regional coherence of the measures remains moderate.

All Member States make very clear links between their MSFD programmes of measures and the measures taken under other pieces of EU law, in particular the Habitats Directive, the Water Framework Directive and the common fisheries policy.

This is in line with the finding that 58% of the measures included in these second programmes of measures are derived from other legal instruments ([77]). Most are linked to pollution-related frameworks (e.g. the WFD, the urban wastewater treatment directive, the waste, chemicals and agricultural law, the Minamata Convention on mercury), biodiversity-related frameworks (such as the Birds and Habitats Directives, the EU biodiversity strategy, the Convention on Biological Diversity) and fisheries and maritime-related policies (e.g. maritime spatial planning, the common fisheries policy, International Maritime Organization, etc.). Most Member States also refer to the objectives of the biodiversity strategy, but rarely to the 30% and 10% targets set in the strategy. There are even fewer references to the zero pollution action plan, although the measures adopted under the MSFD to fight pollution are fully aligned with its objectives.

Coordination with authorities in charge of implementing the Water Framework Directive and the maritime spatial planning processes are most often mentioned in the MSFD reports; less so in the WFD RBMPs. Only a few Member States elaborated on how they govern and coordinate between different policies and the outcomes of this coordination. For instance, one Member State explained

([76]) See European Commission, Joint Research Centre: Louropoulou, E., et al., Programmes of Measures under the Marine Strategy Framework Directive to achieve or maintain Good Environmental Status, as above.
([77]) For a more detailed analysis, see Figure 2 in SWD(2025) 1.

that the authorities responsible for the MSFD and those responsible for WFD had drawn up a catalogue of measures common to the objectives of both laws and that they update the catalogue in line with the MSFD and WFD implementation cycles (see also WFD report) ([78]).

Regional coordination, in particular through the RSCs, is cited frequently throughout the programmes of measures and mentioned by all 17 Member States. They also describe coordination mechanisms with neighbouring countries within the RSCs and make frequent references to action plans (e.g. the OSPAR regional action plan for marine litter or the Baltic Sea action plan), joint initiatives or projects in the individual descriptor sections. Some Member States complemented this with further contacts at subregional level, for instance holding trilateral meetings to identify common issues related to the management of MPAs, marine litter and underwater noise in the Bay of Biscay.

Despite intense and time-consuming coordination within the different regions, it is unsatisfactory to see that, on average, there is only a moderate degree of regional coherence of the programmes of measures. Coherence is particularly poor in action to tackle contaminants in seafood (D9), hydrographical conditions (D7) and food webs (D4) in all three regions. Confirming the positive results achieved over this period, coherence is highest (moderate to high) in all three regions on marine litter (D10).

Good example

Support from the RSCs in developing the measures can play an important role. In the Baltic Sea, HELCOM's Sufficiency of Measures tool (79), used by most Baltic Member States, has led not only to a higher level of regional coherence but also to a higher level of quality of the measures put forward by the individual Member States.

Member States' likelihood of implementing their programmes of measures

Looking at a number of criteria (including how the Member State takes account of socio-economic impacts, whether it has identified sources of financing, the level of coordination with key EU policies and the level of detail of implementation mechanisms) it is possible to group Member States according to the likelihood of implementing their programmes of measures ([80]) (Table 1).

Table 1. Likelihood of implementation of Member States' second programmes of measures

Likelihood of implementation	Member States	Justification
Highly likely or likely	EE, LV, SE, PT, FI, FR, LT, ES, PL, IE, SI, DE and BE	These Member States made a sound socio-economic analysis of the impacts of their programmes of measures, clearly identified sources of funding and appear to have actively coordinated across different authorities involved in implementing the measures.

([78]) Report from the Commission to the Council and the European Parliament on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) Third river basin management plans Second flood risk managment plans, COM(2025) 2

([79]) https://helcom.fi/baltic-sea-action-plan/som/#:~:text=The%20aim%20of%20the%20sufficiency,GES)%20in%20the%20Baltic%20Sea.

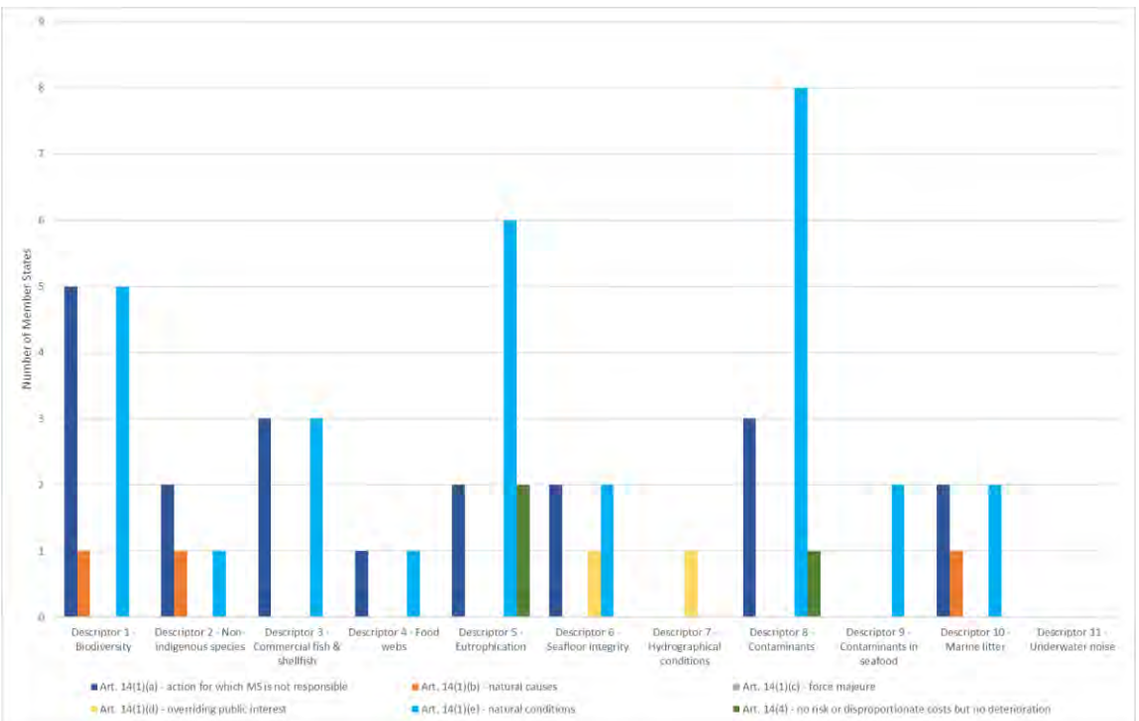
([80]) A more detailed explanation of the methodology used for this assessment is provided in the SWD accompanying this report.

Likelihood of implementation	Member States	Justification
		Importantly, it is clear how, where and when the new measures they proposed will be implemented.
Moderately likely	NL, RO and CY	These Member States made a partial analysis of the socio-economic benefits of their measures and investigated social issues to a limited extent. They listed sources of funding but did not allocate specific amounts to specific measures. Coordination with authorities appears more limited or superficial and it is also less clear where, how and when new measures will be implemented.
Not likely	IT	This Member State provided little information on sources of funding and reported only a superficial socio-economic analysis of its measures. There is no sign of coordination between the MSFD and other EU laws or it has not been reported. It is also not clear where, when and how new measures will be implemented.

The Directive also enables Member States, in well-defined circumstances, to apply exceptions to achieving GES (Article 14). These circumstances include the fact that achieving such goals is related to action or inaction beyond their responsibility, *force majeure* events, or the fact that natural conditions do not enable them to achieve a timely improvement in the status of their marine waters.

As shown in Figure 4, 12 of the 17 Member States reported exceptions for all these possible reasons, except *force majeure*. Contaminants and eutrophication are the topics for which most Member States requested an exception, citing natural conditions that do not enable the timely improvement in the status of marine waters. Underwater noise is the only topic for which no exception was requested, and few exceptions were requested for food webs, hydrographical conditions and seafood contaminants, all topics that are currently not very well developed under the MSFD.

Figure 4. Exceptions to the non-achievement of GES as reported under the second programmes of measures



5. CONCLUSIONS AND OUTLOOK

Member States have done an impressive work in identifying and tackling the highly complex and diverse nature of marine pressures needed to achieve GES. The share of **measures specifically designed for the MSFD** – and not adopted under other frameworks – has **increased from 25% to 42%,** showing that the MSFD is a key driver of new measures to protect the marine environment and to use it sustainably.

Despite this, further work is required to harmonise the development of measures as there are **clear disparities across descriptors and Member States**. On average across all 17 Member States, only measures for marine litter and non-indigenous species are considered to tackle to some extent the issues needed to remedy the problems ([81]). Measures to tackle other forms of pollution, biodiversity loss and climate change are still considered insufficient, although progress has been made in some areas such as seabed protection and alterations to hydrographical conditions.

Many measures stem from other legislative frameworks, such as EU law governing water, nitrates and chemicals, the common fisheries policy or the Birds and Habitats Directives. These frameworks do not have the same scope, however, and the MSFD sets out requirements for additional forms of environmental pressures (for instance, marine pollution in offshore areas, e.g. from fossil fuel production). **This shows the need for more work to cover these gaps when designing MSFD measures**.

In contrast, Member States have taken better measures to tackle pressures or impacts that are less well covered by other policies and legislation, with the exception of underwater noise and food webs. In the absence of a 'safety net' of targeted long-standing legislation regulating the

([81]) Detailed explanations on the methodology and scoring of the adequacy assessment are included in SWD(2025) 1.

issue at EU level, overall Member States have been more innovative in identifying measures for non-indigenous species, hydrographical conditions, seafloor integrity and marine litter. They still use existing frameworks but achieving GES for these topics requires Member States to think collectively about new approaches to tackle these problems.

Measures on marine litter are a good illustration of how the MSFD can make a difference while working in synergy with other legislative frameworks. As a starting point, several Member States have been able to assess how far they are from achieving the GES objective, quantified through the recently agreed threshold value ([82]). Based on this, they designed suitable measures to close the gap, including references to other frameworks. Not only are the measures for marine litter of better quality than the measures for other topics, but they are also more regionally coherent. By contrast, measures on underwater noise still fall short of expectations. It shows that success depends on many factors, including high public awareness and a solid data and knowledge basis, both of which are still lacking to some extent for underwater noise.

For the main part, the **measures are moderately coherent within a marine region**. The degree of coherence is higher where tools have been developed to support the assessment of how far Member States are from GES and the measures needed to close the gap, for example through the work of HELCOM in the Baltic Sea. Of the seven Member States considered to have a good quality programme of measures, five share waters in the Baltic Sea region and have worked together in the framework of HELCOM.

In general, the approach to taking measures under the MSFD still requires work and effort. In particular, **it remains difficult to gauge by how much and by when the measures will reduce the impact on the marine environment and help achieve GES**. This is partly due to the lack of clearly quantified GES, and partly to a lack of suitable tools and methodologies, including modelling, to better assess the action needed to achieve GES. Recent developments in this field are encouraging and should continue. These issues will also be analysed further in the upcoming MSFD evaluation.

6. RECOMMENDATIONS

Country-specific recommendations are provided in the staff working document accompanying this report ([83]). The following recommendations are applicable to all EU Member States:

1. Member States should **increase the level of ambition** and **accelerate action to achieve the objectives of the Directive**. This involves:
    a. developing more robust programmes of measures based on a clearer assessment of the gap to be bridged to reach good environmental status;
    b. designing quantitative measures that bridge the gap between the current status and good environmental status, as quantified by the threshold values set at EU, regional and subregional level and integrated into Member States' marine strategies ([84]);
    c. ensuring that measures taken under other legislation and policies have the right ambition level to contribute to the achievement of GES, or complementing them to cover issues that are needed for GES but are not part of existing frameworks.

([82]) https://publications.jrc.ec.europa.eu/repository/handle/JRC121707
([83]) SWD(2025) 1
([84]) Communication from the Commission, Commission Notice on the threshold values set under the Marine Strategy Framework Directive 2008/56/EC and Commission Decision (EU) 2017/848 (C/2024/2078), 11.3.2024.

2. Member States should identify and put in place, as appropriate**, additional measures to reduce persistent environmental challenges** (pressure) that prevent the achievement of good environmental status.

    a. On **pollution**, this involves:
        i. stepping up action to reduce underwater noise pollution, including by tackling the main sources of continuous noise – such as shipping – and by setting up low-noise areas for marine species;
        ii. stepping up action to reduce nutrient pollution to achieve the objectives of the MSFD, WFD and the Nitrates Directive;
        iii. reducing chemical pollution from sea-based sources, in particular hydrocarbon extraction, and from novel substances, including PFAS, pharmaceuticals or microplastics;
        iv. continuing action to reduce the impact of litter on marine life, while reducing the inputs at source.

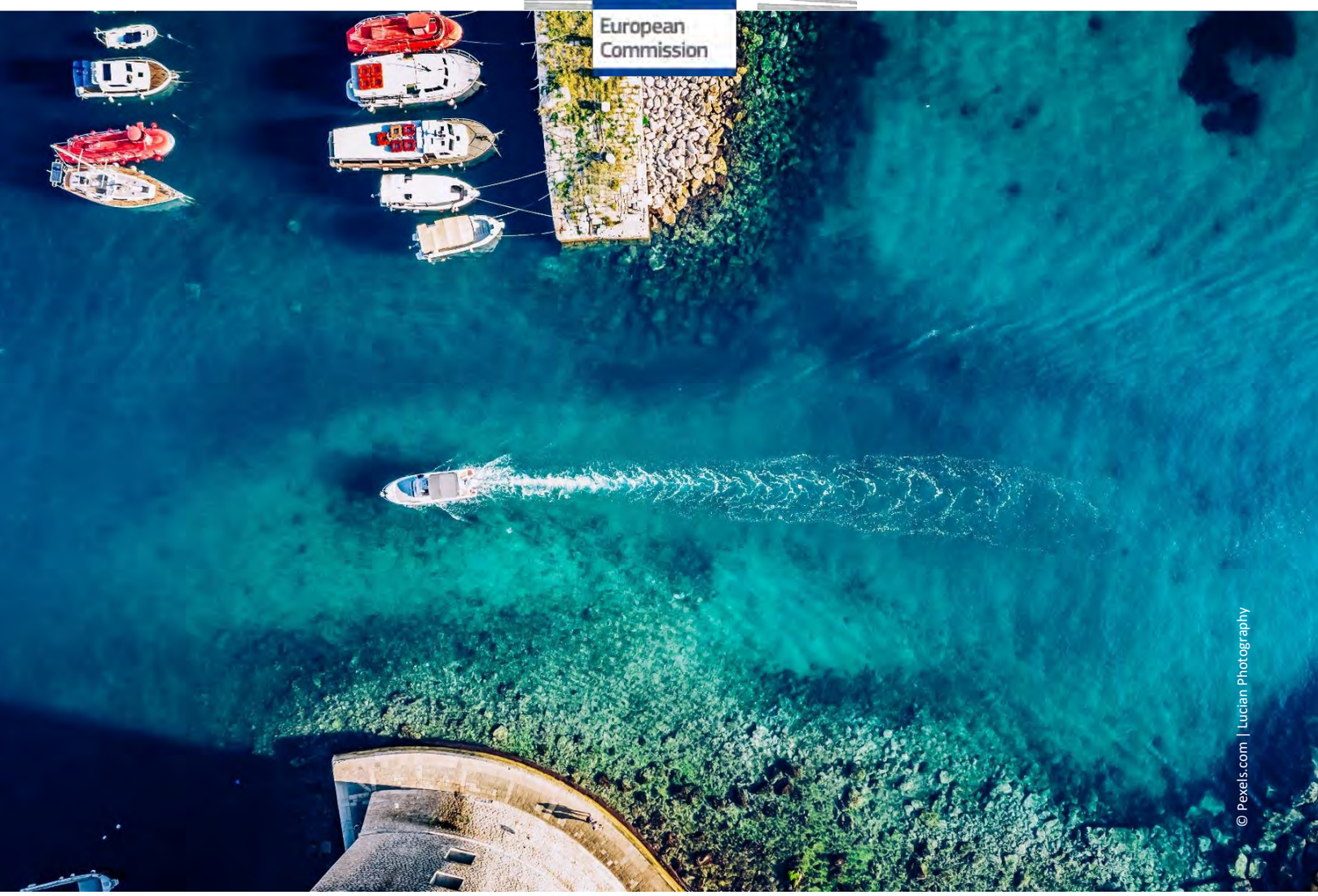
    b. On **biodiversity**, this involves:
        i. completing the network of coherent, representative, effectively managed MPAs to reach the 2030 target set in the biodiversity strategy to protect 30% of waters, including 10% strictly, in line with the ambition set in the marine action plan and the obligations under the Kunming-Montreal Global Biodiversity Framework;
        ii. stepping up action to reduce the bycatch of sensitive species, starting with the priority species as recommended in the marine action plan;
        iii. implementing without delay the obligations under the Nature Restoration Regulation as critical contributions to achieving GES under the MSFD;
        iv. tackling the risks to marine ecosystems linked to the projected expansion of offshore renewable energy production, together with the cumulative impacts of existing activities at sea, through forward-looking ecosystem-based maritime spatial planning.

    c. Regarding **climate change**, all Member States should seek to factor climate change in the design and selection of their measures and in particular:
        i. prioritise measures that help limit/reduce greenhouse gas emissions, including by restoring blue carbon ecosystems;
        ii. ensure that other measures or groups of measures do not increase greenhouse gas emissions;
        iii. take measures to strengthen the adaptive capacity of coastal communities to climate change, e.g. by restoring coastal ecosystems.

3. Member States should **increase investment and provide sufficient financing to implement the programme of measures** to reach the MSFD objectives. This involves in particular:

    a. developing a strategic outlook for investments to achieve good environmental status, avoiding a piecemeal approach to funding individual measures and reducing inefficiencies across different policy areas;
    b. clearly identifying the source of financing needed to implement all measures;
    c. making use of existing financial instruments and tools that support the development of measures for marine protection and sustainable use, including through research and innovation, such as the Cohesion, Recovery and Resilience Facility, regional funds, EMFAF, LIFE and Horizon Europe in its different clusters (e.g. Missions and Partnerships), among others.

4. Member States should put in **place governance mechanisms that support the design and implementation of ambitious, coherent, coordinated, fair and effective programmes of measures**. This involves:
    a. tackling decisively the obstacles to implementing the measures, such as insufficient financing;
    b. improving coordination across authorities to ensure that MSFD measures dependent on other policies are fully implemented by the authorities dealing with implementation of these policies, notably in relation to fisheries, agriculture and energy;
    c. involving the public and stakeholders at the planning stage, taking their contributions into account in the design of measures and ensuring social acceptability of the measures proposed, adopting accompanying measures to limit potential negative impacts if necessary;
    d. increasing early coordination of programmes of measures with neighbouring Member States to ensure coherence, synergies and the complementarity of measures in the region and planning joint action where necessary;
    e. operationalising the spatial aspects of MSFD programmes of measures through maritime spatial plans to ensure that the spatial protection measures and spatial pressure reduction measures planned are fully taken up in the MSP.
5. Lastly, Member States should provide **more up-to-date and complete electronic reporting** in order to give greater transparency to the public on the measures proposed and on how they are expected to support progress towards GES and the targets. This will also enable comparability across Member States and marine regions.



Marine Strategy Framework Directive

Assessment of Member States' second programmes of measures

1. Introduction

The Marine Strategy Framework Directive (MSFD) is the main legal instrument of the European Union for the protection and sustainable use of the European Seas. According to this Directive, each Member State should develop a marine strategy for its marine waters which, while being specific to its own waters, reflects the overall perspective of the marine region or subregion concerned. The final stage in the preparation of the marine strategies is the identification of measures needed to achieve or maintain good environmental status (GES) (Article 13(1)) and the integration of those measures into a programme of measures (PoM) to be reported to the European Commission by 31 of March 2016 (Article 5(2)(b)(i) and Article 13(9)) and updated every 6 years after that (Article 17(2)). It was therefore expected that Member States would report an updated programme of measures by 31 March 2022.

Following receipt of these submissions, according to Article 16, the European Commission must assess these reports and provide guidance to Member States on modifications considered necessary.

MSFD Article 16 – Notifications and Commission's assessment

On the basis of the notifications of programmes of measures made pursuant to Article 13(9), the Commission shall assess whether, in the case of each Member State, the programmes notified constitute an appropriate framework to meet the requirements of this Directive and may ask the Member State concerned to provide any additional information that is available and necessary.

In drawing up those assessments, the Commission shall consider the coherence of programmes of measures within the different marine regions or subregions and across the Community.

Within six months of receiving all those notifications, the Commission informs Member States concerned whether, in its opinion, the programmes of measures notified are consistent with this Directive and provides guidance on any modifications it considers necessary.

The technical assessments on which this document is based analyse Member States' reporting of their programmes of measures. These technical assessments consist of:

- An **EU-level technical analysis** ([85]) of the information reported electronically by Member States providing an overview of the level of completeness and harmonisation of the measures according to their purpose, type and coverage of descriptors, pressures, features and marine areas among others.
- **Member State-specific assessments** ([86]) looking at the completeness and adequacy of the content of the measures, in particular how the measures address the pressures on the Member States' marine waters, as identified under Article 8, how the measures contribute to achieving GES and targets, as defined under Article 9 and 10 and whether governance mechanisms are in place to support the implementation of the Programmes of Measures.
- **Regional coherence assessments** comparing several elements of the Member States' national reporting and drawing conclusions on the level of coherence between Member States in the same marine region. In particular, the assessment looked into coverage of pressures and activities, purpose and content of measures, approach to the assessment of gaps to achieve GES, use of MSFD-specific measures or measures from other instruments and use of exceptions.

([85]) This analysis was prepared by the European Commission, Joint Research Centre: Louropoulou, E., Alonso Aller, E., Cardoso, A.C., Carravieri, A., Druon, J., Magliozzi, C., Martini, E., Mendes, C., Palma, M., Piroddi, C., Ruiz-Orejón, L.F., Zupan, M. and Hanke, G., *Programmes of Measures under the Marine Strategy Framework Directive to achieve or maintain Good Environmental Status*, Publications Office of the European Union, Luxembourg, 2024, JRC139180.]

([86]) These assessments were carried out by an external consultant. National reports for each Member State can be consulted at: https://environment.ec.europa.eu/topics/marine-environment/implementation-marine-strategy-framework-directive_en#second-implementation-cycle-2018--2023

Only five Member States reported by the deadline, a further nine with up to one-year delay and finally three with more than one-year delay but still on time to be included in this assessment ([87]). In total, the Programmes of Measures from these 17 Member States could be assessed (out of 22 coastal Member States): Belgium, Germany, Ireland, Spain, Estonia, France, Italy, Cyprus, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovenia, Finland and Sweden. This late- or non-reporting has limited the Commission's ability to perform fully encompassing regional coherence assessments, in addition to checking the adequacy and completeness of the reports received.

This Staff Working Document starts with a general EU-level overview of the types of measures taken by Member States in their second programmes of measures and their coverage of descriptors, pressures, features and marine areas among others, and related comparisons with the measures taken in the first MSFD cycle of implementation.

In a second stage, the content of the measures is analysed to attempt to answer the question: how do the measures taken under the MSFD contribute to tackling the triple planetary crisis? The SWD then focuses on the regional coherence of measures and the governance mechanisms in place to support the implementation of the PoMs, including coordination between different authorities, public involvement and level of investments.

The sixth chapter of this document provides the country-specific conclusions from the assessment of adequacy of the measures to achieve good environmental status by descriptor and for cross-cutting issues based on the Member States' reports. The final chapter provides a list of Member State-specific recommendations for a number of topics as well as per descriptor.

Overarching conclusions from this analysis together with general recommendations for all Member States are presented in the Commission's report ([88]). Moreover, the findings of this assessment of the countries' programme of measures have also fed into the MSFD evaluation which has been carried out in parallel ([89]).

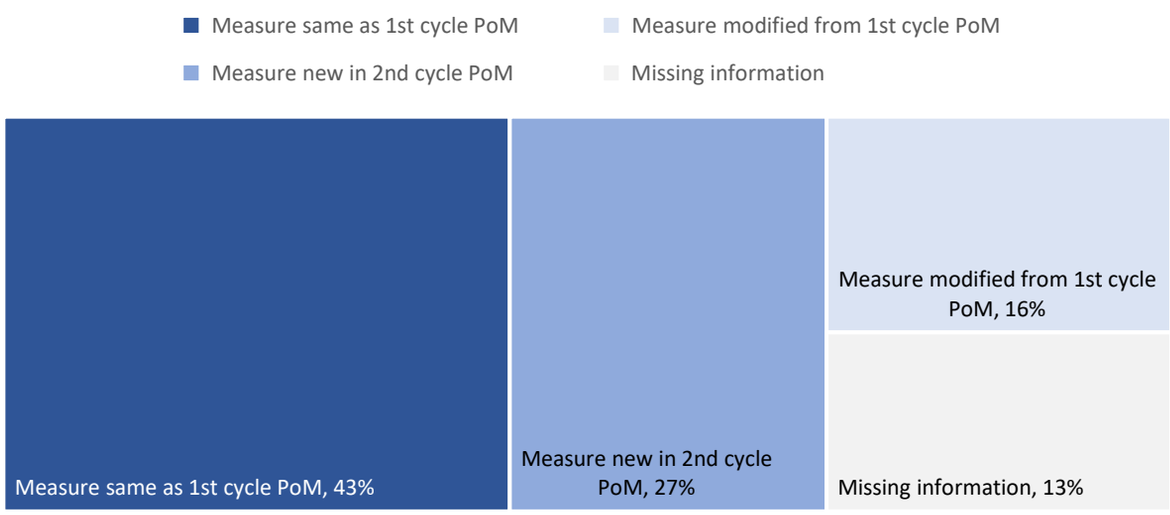
([87]) On time – BE, IT, RO, SE, FI; up to 6 months delay – NL, DE, FR, PL, ES; up to 1 year delay – IE, PT, SI, EE; by 1 September 2023 – CY, LT, LV.
([88]) Report from the Commission to the Council and the European Parliament on the Commission's assessment of the Member States' programmes of measures as updated under Article 17 of the Marine Strategy Framework Directive (2008/56/EC) – COM(2025) 3.
([89]) Commission Staff Working Document, Evaluation of 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), SWD(2025) 50 (available in the first semester of 2025).

2. General overview of measures

This report presents key outcomes from the Commission's assessment of the second programmes of measures, which all Member States had to report to the Commission by 31 March 2022. The analysis includes programmes of measures presented by the 17 Member States which reported by September 2023. In total **2046 measures** were reported, covering all marine regions, descriptors and pressures on marine ecosystems.

As shown in Figure 1, **60% of the measures** reported for the second cycle **prolong measures reported in the first cycle**, including 16% with some modifications. Almost **a third (27%) are new measures** introduced specifically for the second cycle of implementation.

Figure 5. Comparison with first cycle of implementation



Looking at individual Member States, differences can be observed, with **a few Member States** ([90]) **exceeding 30% of new measures** (even reaching 88% for one Member State ([91])), while several others ([92]) have high shares of measures that are the same, i.e. not modified, as the first programmes of measures. In most instances, the changes made to measures prolonged from the first cycle are quite limited, having mostly to do with **adaptations due to other legislation being updated**, while improvements in the way measures are being designed and implemented remain modest.

According to Member State's reporting, **over 50% of measures are fully implemented on the ground**: almost 40% of measures have been reported as "implemented", indicating that all planned components (in time and space) of these measures are fully completed, and for an additional 17% of measures, implementation is reported as "ongoing", indicating that these measures are implemented and continuing into the future. For almost a quarter of measures (23.5 %), **implementation is reported as already started**, indicating that as of the time of reporting the second programmes of measures to the Commission, one or more planned components of these measures have been started. Finally, **for 17% of measures, implementation is reported as not having started.** Only 2.5 % of the measures across all Member States have been withdrawn between the first and second cycles. Logically, most of the 'implemented' measures (63%) are those originating from the first programmes of measures while the majority (57%) of measures, for which implementation has not started are 'new' measures to this cycle.

([90]) BE (35%), EE (67%), ES (35%), PL (33%), SI (38%)
([91]) LV
([92]) CY (78%), IE, (71%), IT (75%), RO (81%)

Regarding obstacles to implementation, many Member States reported that there was no obstacle (in 48% of cases). Among obstacles encountered, **financing** was the most prominent reason for not implementing measures for four Member States ([93]) followed by **technical implementation issues** ([94]) and **national mechanisms for implementation** ([95]).

Overall, **the majority of measures reported in the second cycle (58%) are existing measures** adopted for other EU legislation, Regional Sea Conventions, international agreements or national legislation, which are designed for the implementation of those policies but are also relevant to the MSFD.

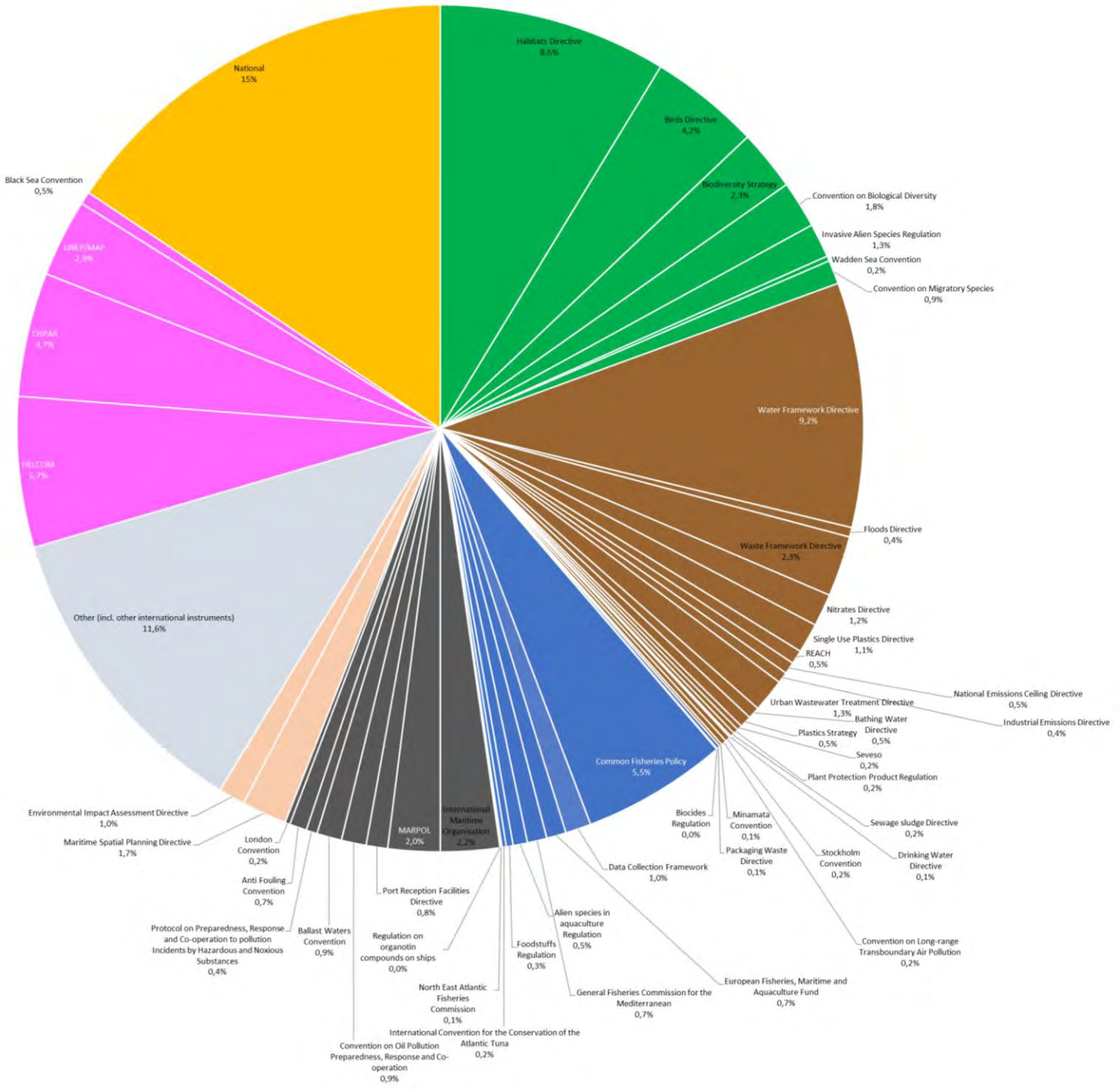
Member States have associated their measures to other frameworks at national, EU, regional and international levels, which can be seen as drivers for taking these measures (besides the MSFD itself). **National policies** are the most frequently linked to MSFD measures (19%) ([96]) and the four European **Regional Sea Conventions** close behind (14%), in particular HELCOM (6%) and OSPAR (5%) (Figure 2) ([97]).

Grouping references by topics, **land-based pollution instruments** (18%) are most frequently linked to MSFD measures, in particular the Water Framework Directive and other water-related legislation (e.g. on Urban Wastewater Treatment or Bathing Waters directives), waste legislation (e.g. Single Use Plastics Directive), chemicals legislation (e.g. REACH), agriculture-related legislation (on Nitrates, Sewage Sludge or Plant Protection Product) and international conventions (e.g. the Minamata Convention on mercury or the Stockholm Convention on persistent pollutants). **Biodiversity-related instruments** are also frequently referenced (15%), including EU legislation (Birds and Habitats Directives, Invasive Alien Species Regulation) and EU policies (Biodiversity Strategy) as well as international conventions (Convention on Biological Diversity, Convention on Migratory Species, Wadden Sea Convention, etc.).

In comparison, references to **maritime pollution and shipping policies** are less frequent (8%) but focus in particular on instruments related to the International Maritime Organization (IMO). 8% of references are made to **fisheries-related policies**, in particular the Common Fisheries Policy (CFP) but also the European Maritime and Fisheries Fund (EMFF) and the Data Collection Framework (DCF), as well as the international dimension of fisheries with references to the Regional Fisheries Management Organisations such as the General Fisheries Commission for the Mediterranean (GFCM), the International Convention for the Conservation of Atlantic Tuna (ICCAT) and the North East Atlantic Fisheries Commission (NEAFC). Finally, 6% of references to other frameworks are linked to EU planning policies (Maritime Special Panning and Environmental Impact Assessment Directives).

([93]) DE, ES, PT and RO
([94]) CY, DE, EE, ES, FR, PT
([95]) DE, EE, ES, FR, PT
([96]) It should be noted that in several MS, the legal basis for implementing EU Directives lies within their national legislation.
([97]) It should be noted that these shares were calculated after excluding from the total number of references those made to the MSFD itself (approx. 18% of the total).

Figure 6. References to other national, EU and international instruments in MSFD Programmes of measures



Unsurprisingly, the EU instruments most often linked to MSFD measures are the Habitats Directive (10%), the Water Framework Directive (8%), the Common Fisheries Policy (6%), the Birds Directive (5%) and the Maritime Spatial Planning Directive (4%).

Approximately **42% of the measures included in the second programmes of measures ([98]) are MSFD-specific measures** devised in order to achieve or maintain GES. Approximately half of these (20% of all measures) build upon existing implementation processes of other EU legislation and international agreements but go beyond what is already required under these (category 2.a) and the other half (22% of all measures) are not driven by any other instrument than the MSFD (category 2.b). This is a **substantial increase compared to the first cycle** where only 25% of measures were defined as 'new' measures put into place specifically for the purposes of the Directive ([99]).

Almost half of the measures in this second cycle can be considered 'direct' measures, designed to **prevent further inputs** of pressure (25%), **reduce existing levels** of pressure (17%) or restore species or habitats (5%). Still, 37% of the measures are designed to **indirectly prevent inputs of a pressure** (e.g. through governance mechanisms, financial incentives or awareness campaigns) while **measures linked to knowledge improvement** make up approximately 17% of the total.

Almost 60% of measures in the second programmes of measures are reported to be covering **coastal waters**, and a little over 50% also **territorial waters and the exclusive economic zone** (**EEZ**) ([100]). An important share of measures is reported as covering inland waters (35%) and transitional waters (30%), pointing to the **inclusion in the MSFD programmes of measures from the River Basin Management Plans** and other measures aiming to prevent pollution at source. A small share of measures is also reported as covering the **extended continental shelf** and **waters beyond Member States' jurisdiction**. The latter is particularly interesting since these waters do not fall in the scope of the MSFD. Coastal waters, which are both very rich in marine biodiversity and very busy in terms of human activities, remain the best covered part of Member States' marine waters.

In terms of coverage of marine regions and subregions, the analysis is skewed by the fact that one Member State from the Black Sea (out of two in the region) and three Member States from central and eastern Mediterranean (out of six in the two subregions) have not reported in time to be included in the analysis. Unsurprisingly, therefore, the subregions best covered by measures are the **Baltic Sea** (39%) and **the Greater North Sea** (31%), followed by the **Western Mediterranean Sea** (23%) and the **Bay of Biscay and Iberian Coast** (18%).

Overall, **all descriptors of good environmental status** ([101]) **have been covered by the Member States' Programmes of Measures**, some better than others. Over 30% ([102]) of Member States' measures have been associated with biodiversity (Descriptor 1), 28% with seafloor integrity (Descriptor 6), 24% with contaminants (Descriptor 8) and 22% with marine litter (Descriptor 10). These numbers include measures that are associated to several descriptors. Logically, biodiversity descriptors come out strong in this comparison as many measures addressing pressures are reported by Member States as also addressing biodiversity. The descriptors least frequently associated to measures are hydrographical conditions (Descriptor 7; 8%), contaminants in seafood (Descriptor 9; 9%), non-indigenous species (Descriptor 2) and underwater noise (Descriptor 11) at 10% each.

([98]) This includes both measures prolonged from the first cycle, and new measures taken for the second cycle.
([99]) Report from the Commission to the European Parliament and the Council assessing Member States' programmes of measures under the Marine Strategy Framework Directive, Brussels, 31.7.2018 COM(2018) 562 final
([100]) Note that one measure can be implemented spatially in more than one area, hence percentages do not sum up to 100%.
([101]) The 11 qualitative descriptors are defined in Annex I of Directive 2008/56/EC and are further specified in Commission Decision (EU) 2017/848: 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).
([102]) Note that one measure can be reported against several descriptors, hence percentages do not sum up to 100%.

Many measures reported by Member States address several descriptors (Table 1). This might be because **the subject of the measure is relevant to several descriptors**: for instance, in the case of measures aiming to reduce levels of pressure, which in turn contribute to the achievement of several descriptors (e.g. improvement in wastewater treatment helps reduce levels of contamination, eutrophication, litter and restore biodiversity). In other cases, Member States include **cross-cutting measures**, which are linked to governance and stakeholder participation or to the implementation of broad policies and link those to all descriptors.

Table 2. Examples of cross-cutting measures in Member States' reports

MS	Measure Name (Translated)	Associated GES Descriptor
DE	Integrated Coastal Zone Management	D1; D4/D1; D5; D6/D1; D7; D8
ES	Promoting marine citizen science activities for the improvement of the management of the marine environment	D1; D2; D3; D4/D1; D5; D6/D1; D7; D8; D9; D10; D11
FR	Spatial planning of maritime uses and activities	D1; D2; D3; D4/D1; D5; D6/D1; D7; D8; D9; D10; D11;
IE	Licensing; regulation and planning for the marine and coastal environment	D1; D2; D3; D4/D1; D5; D6/D1; D7; D8; D9; D10; D11
SE	Authorities and municipalities working on the MSFD programme of measures need to report on the measures implemented.	D1; D2; D3; D4/D1; D5; D6/D1; D7; D8; D9; D10; D11;

To refine the analysis, it is interesting to also look at the measures which have been associated to only one descriptor (called 'descriptor-specific' measures) (figure 4) and compare the result with the descriptor coverage of all measures (figure 3).

Figure 7. Share of all measures, by descriptor

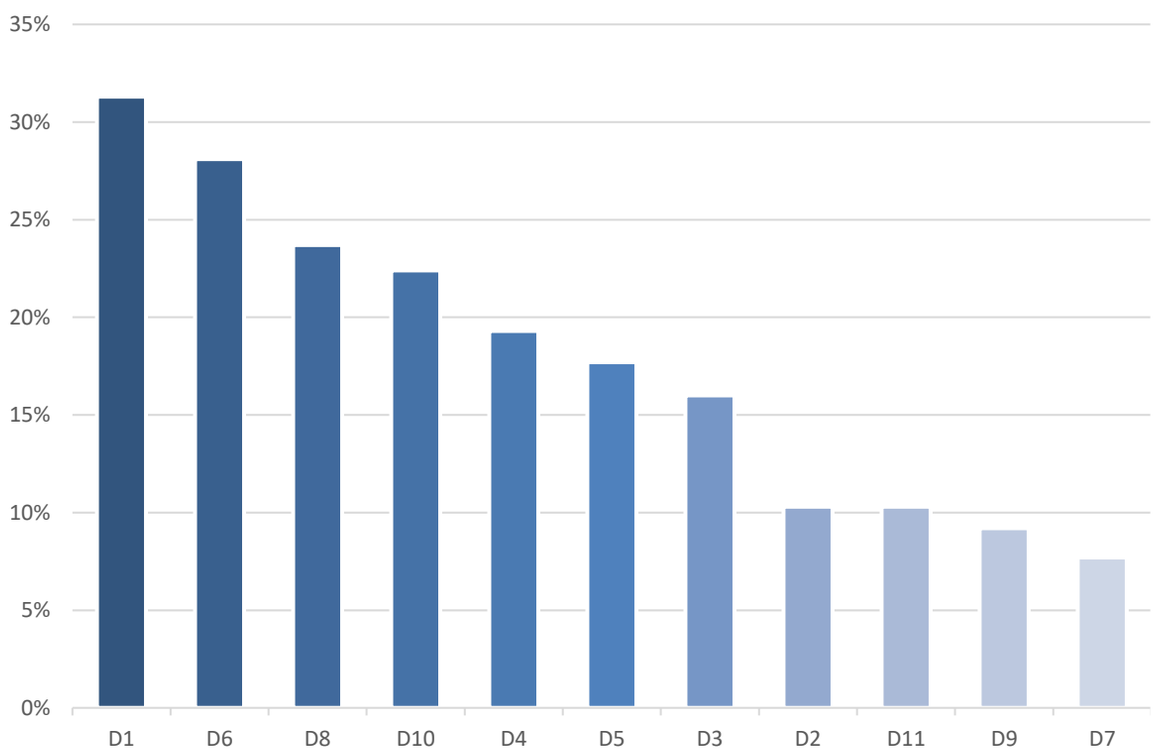
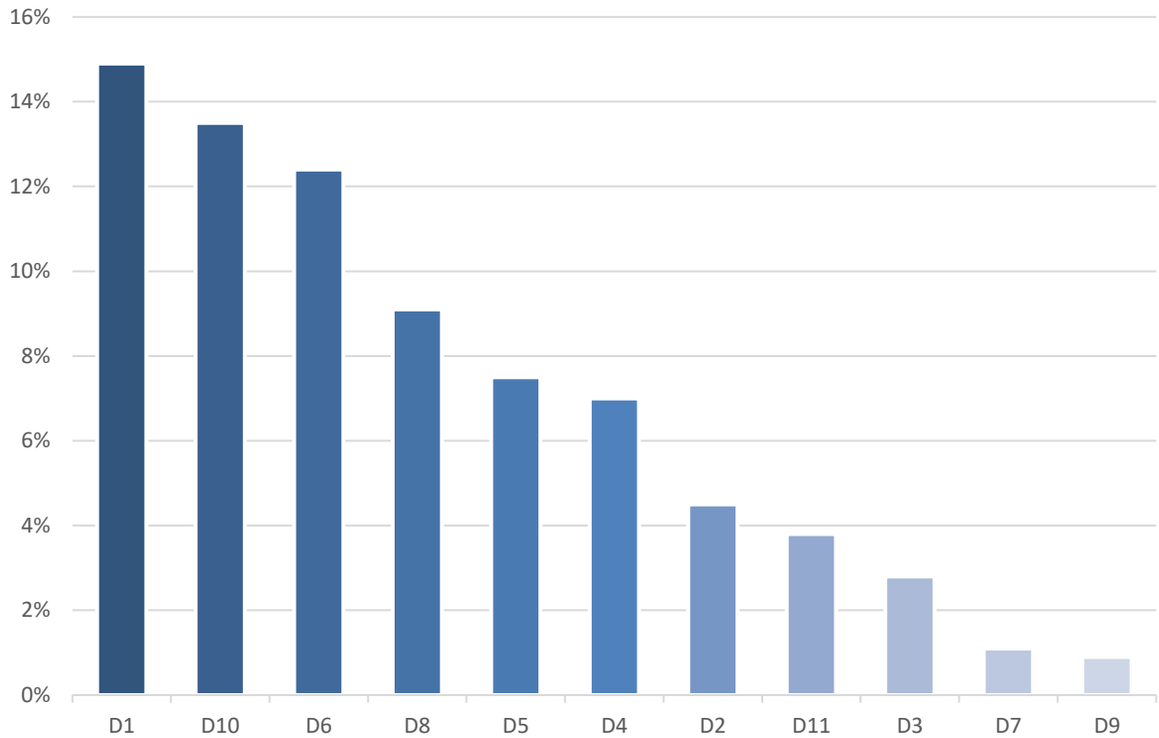


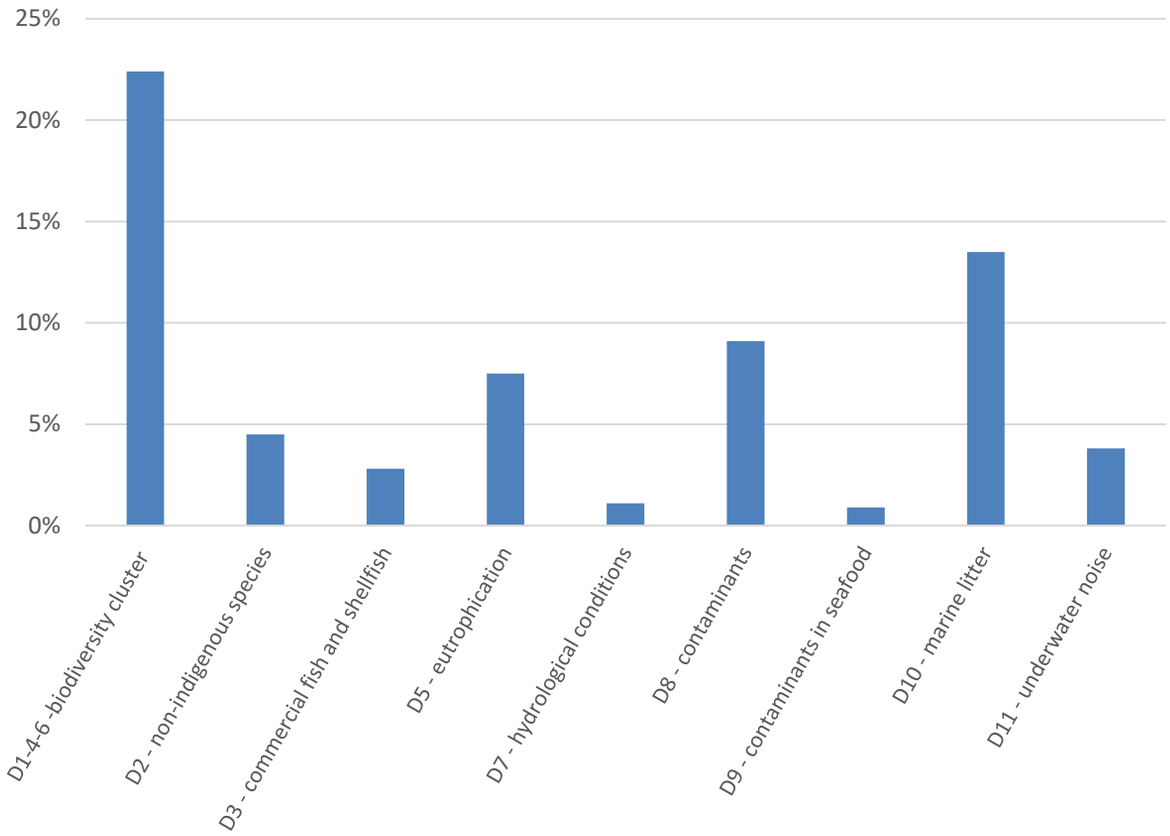
Figure 8. Share of 'descriptor-specific' measures, by descriptor



As can be seen on figure 4, almost 14% of 'descriptor-specific' measures reported by the Member States for the second programmes of measures address marine litter exclusively. Out of these 14%, over 50% are reported as being implemented specifically for the MSFD (i.e. not linked to another instrument). This shows a clear commitment on the part of the Member States to tackle the issue of marine litter and **identifying the MSFD as the most appropriate instrument to do so**. A counter example is descriptor 3 which is addressed by 16% of all measures (figure 3) but only 3% of 'descriptor-specific' measures focus on D3 specifically (figure 4), and out of these 3% only a third are taken specifically for the MSFD, confirming that the issue of the health of commercial fish is still dealt mainly through other frameworks, especially instruments linked to the Common Fisheries Policy.

Grouping the three biodiversity descriptors together in a 'biodiversity-cluster' shows a slightly different picture (Figure 5), where 'biodiversity-specific' measures make up 22% of all measures reported by the Member States in this second cycle of implementation.

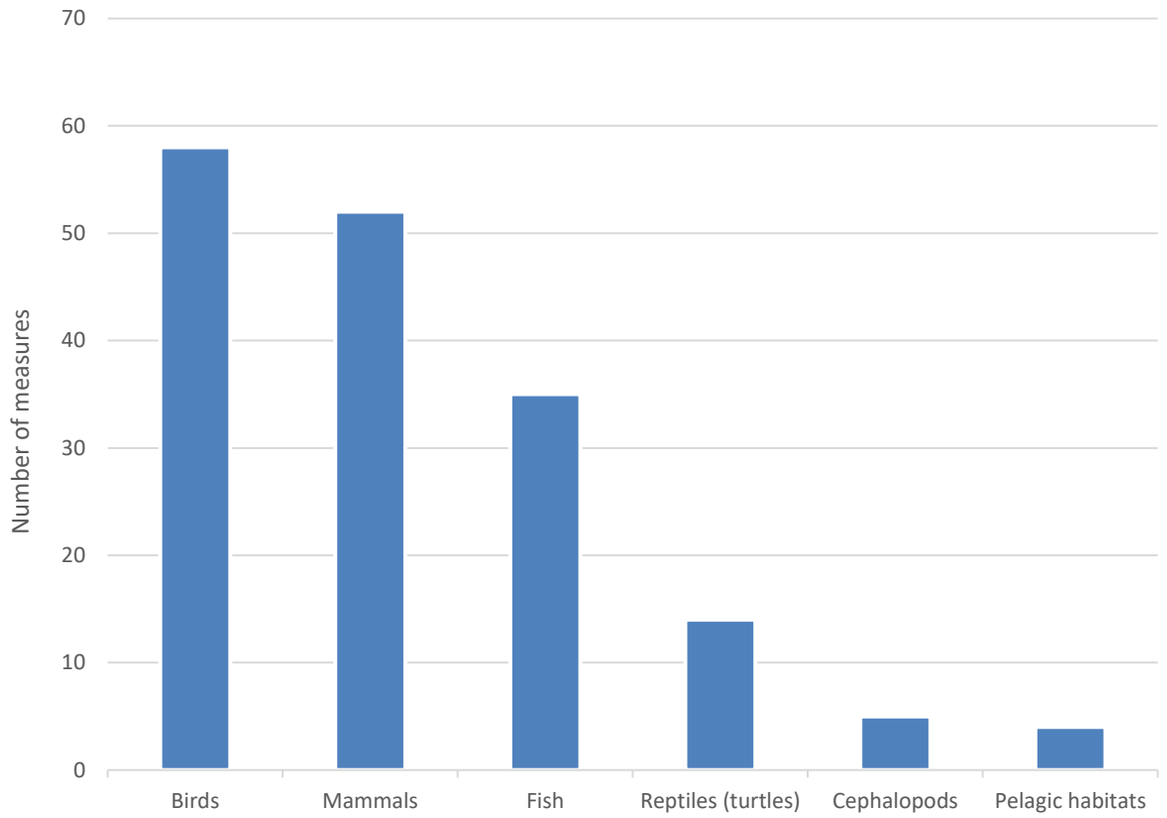
Figure 9. Share of 'descriptor-specific' measures (with biodiversity cluster)



The split of biodiversity measures by **biodiversity components** also informs about the species best covered by MSFD measures (birds, mammals, fish) and the species and habitats that are still suffering from a lack of dedicated attention (cephalopods, turtles, pelagic habitats) (Figure 6) ([103]). This finding is supported by the analysis of the content of the biodiversity measures in section 3.2.

([103]) It should be noted that cephalopods and turtles are not present in all EU marine regions.

Figure 10. Number of measures by biodiversity components



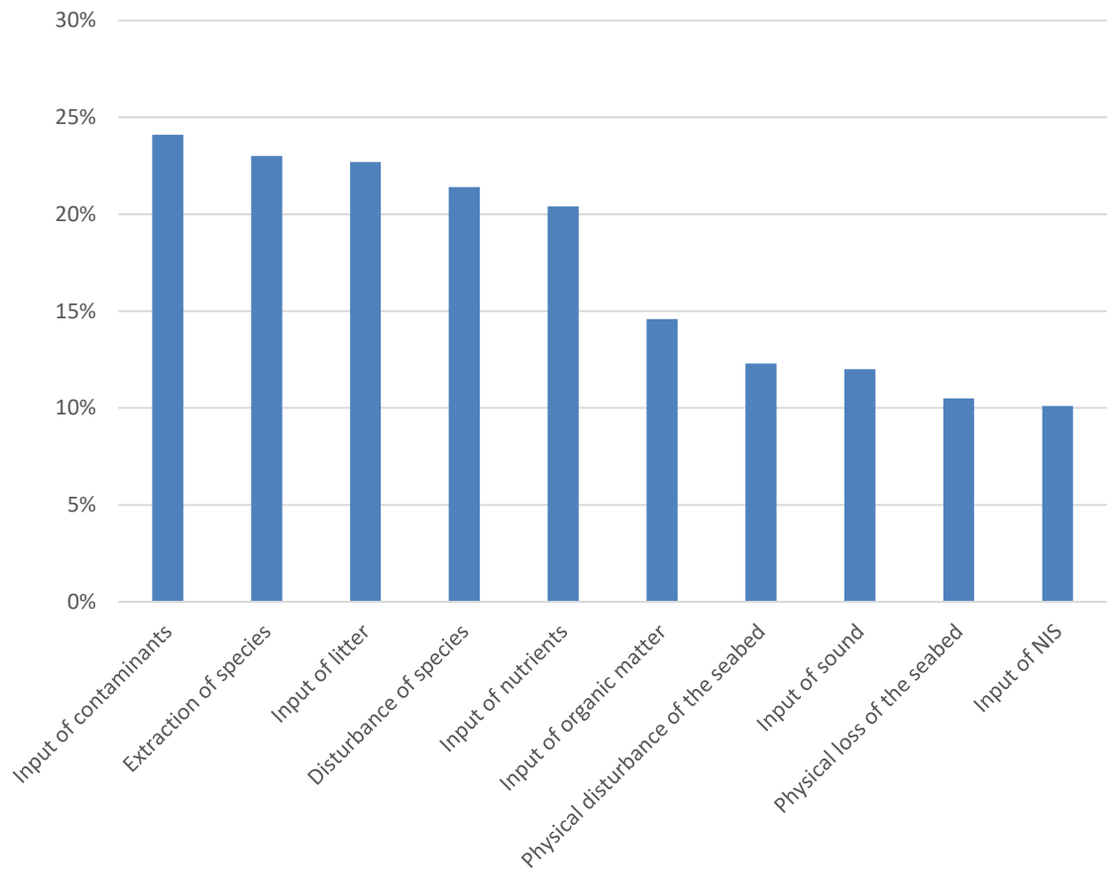
At the (sub)regional level, both the Baltic Sea and Greater North Sea Member States have associated their measures most frequently with biodiversity (D1), closely followed by nutrients (D5) and contaminants (D8) in the Baltic, and seafloor integrity (D6) in the Greater North Sea. In the Western Mediterranean Sea and Adriatic Sea, Member States have associated their measures mainly with seafloor integrity (D6), followed by biodiversity (D1) and litter (D10) for the Western Mediterranean Sea, and commercial fish and shellfish (D3) for the Adriatic Sea. In the Bay of Biscay and Celtic Seas, measures associated with biodiversity (D1 and D6) also come out first, followed by litter (D10) in the Bay of Biscay and commercial fish and shellfish (D3) in the Celtic Seas.

Looking at '**descriptor-specific' measures**, a different picture emerges where some pollution descriptors (D5, D8 and D10) come out in the Baltic and Greater North Sea, whereas in the Western Mediterranean, Celtic Seas and Bay of Biscay, Member States have taken more descriptor-specific measures for litter and biodiversity (D1 and D6).

The measures included in the second programmes of measures cover all the different types of pressures listed in Annex III of the MSFD (Figure 7). Some pressures are more covered than others. For example, the top pressures addressed by measures ([104]) are the **input of contaminants** (24%), the **extraction, mortality/injury of wild species** (23%), the **input of litter** (23%), the **disturbance of species** (21%), and the **input of nutrients** (20%).

([104]) Note that one measure can be reported against several pressures, hence percentages do not sum up to 100%.

Figure 11. Share of measures addressing the top 10 Annex III pressures



Member States report on pressures as categorised according to Annex III MSFD and the Commission Decision ([105]). This categorisation allows to select and analyse measures that address very specific pressures in the marine environment. Member States have, however, not always been consistent in the use of the different categories in their reporting. For instance, **the least covered pressures** according to the electronic reporting are **continuous low frequency sound (3%), impulsive sound in water (3%), and species affected by incidental by-catch (3%)**. **These three pressures, however, are likely to have been covered by other pressure categories**, such as 'input of noise', which covers both continuous and impulsive sound (12%), and 'disturbance of species', which also includes bycatch (21%). The reporting might therefore give a skewed picture of how well certain pressures in the marine environmental are dealt with through the Programmes of Measures.

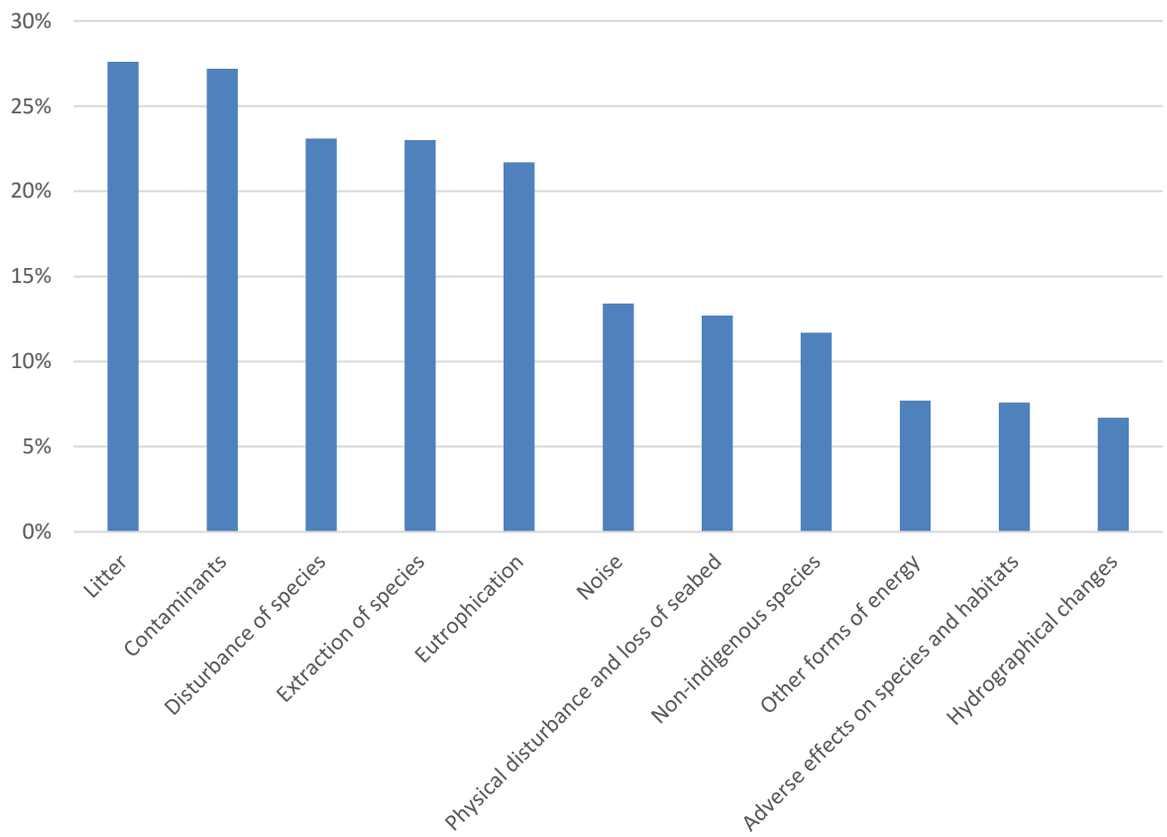
Grouping these specific Annex III pressures into 'headline pressures' ([106]), a slightly different picture emerges than the one presented above (Figure 8). Litter becomes the pressure most frequently addressed

([105]) For instance, the headline pressure 'contaminants' is split into: Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides); Contaminants – non ubiquitous, persistent, bioaccumulative and toxic (uPBT) substances; Contaminants – uPBT substances; Contaminants – in seafood; Acute pollution events

([106]) This analysis was done by grouping together specific pressures under these broader 'headline' pressures, as follows: **Eutrophication** (Input of nutrients; Input of organic matter; Eutrophication); **Contaminants** (Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides); Contaminants - non uPBT substances; Contaminants - uPBT substances; Contaminants – in seafood; Acute Pollution Events); **Litter** (Input of litter (solid waste matter, including micro-sized litter); Litter in the environment; Micro-litter in the environment; Litter and micro-litter in species); **Noise** (Input of anthropogenic sound (impulsive, continuous); Impulsive sound in water; Continuous low frequency sound); **Other forms of energy** (Input of other forms of energy (including electromagnetic fields, light and heat)); **NIS** (Input or spread of non-indigenous species; Newly-introduced non-indigenous species; Established non-indigenous species; Microbial Pathogens; Genetically Modified Species); **Physical disturbance and loss of seabed** (Physical disturbance to seabed; Physical loss of the seabed); **Disturbance of species** (Disturbance of species (e.g., where they breed, rest and feed) due to human presence; Species affected by incidental by-catch; Loss of, or change to, natural biological communities due to cultivation of animal or

by Member States' measures (28%), closely followed by contaminants (27%). Over 20% of all measures address disturbance, extraction of species and eutrophication. Noise, seabed disturbance and non-indigenous species are each addressed by over 10% of all measures and other forms of energy, adverse effects on species and habitats and hydrographical changes are each addressed by less than 10% of measures.

Figure 12. Share of measures addressing headline pressures



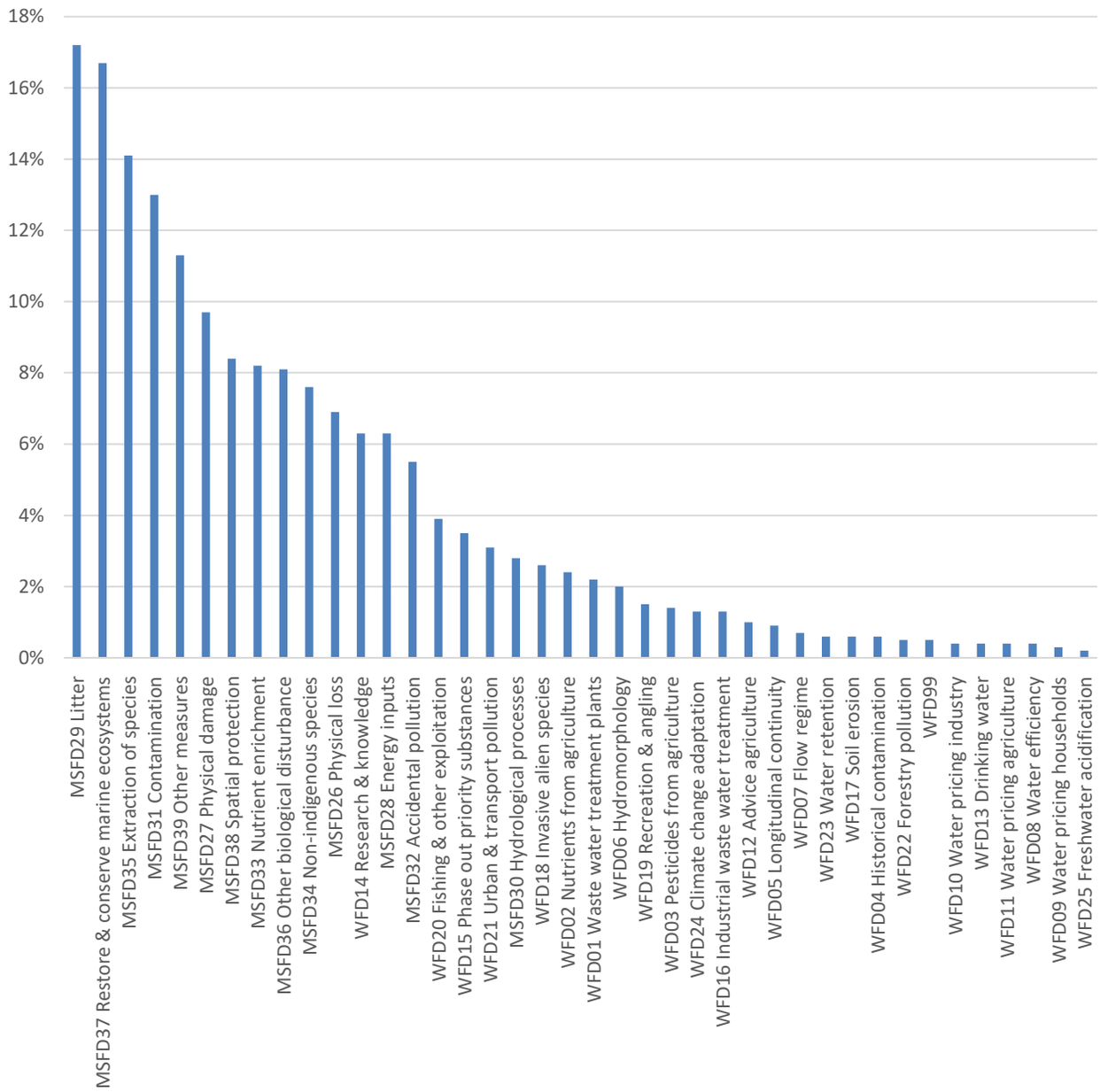
Differences can be seen at the (sub)regional level. Unsurprisingly, the Baltic Member States cover eutrophication-related pressures more than other regions, but input of contaminants and of litter are also well covered. In the Greater North Sea, the most addressed pressures are input of contaminants, input of litter and disturbance of species. In the Western Mediterranean, the disturbance of species is the first pressure addressed by measures, closely followed by input of litter. In the Bay of Biscay, Macaronesia, Ionian and Central Mediterranean and Aegean-Levantine subregions, the input of litter is the first pressure addressed, whereas in the Celtic and Black Seas it is the extraction of wild species (fisheries) and in the Adriatic Sea, input of contaminants.

Finally, looking at "**Key Types Measures**" (KTMs), which are used in the MSFD and the WFD to categorise Member States' measures according to certain pressures or certain types of actions, not all KTMs are equally covered by the Member States' second programmes of measures (Figure 9). The greatest coverage is observed for "Measures to reduce marine litter" (MSFD29), "Measures to restore & conserve marine ecosystems" (MSFD37), "Measures to reduce biological disturbances in the marine environment from the extraction of species" (MSFD35) and "Measures to reduce contamination by hazardous substances" (MSFD31). In contrast, little coverage occurs for "Measures to reduce interferences with hydrological processes in the marine environment" (MSFD30) and other KTMs common to the WFD. This

plant species); **Extraction of species** (Extraction of, or mortality/injury to, wild species (by commercial and recreational fishing and other activities)); **Adverse effects on species and habitats** (Adverse effects on species or habitats); **Hydrographical changes** (Hydrographical changes; Input of water).

is broadly in line with previous results showing a predominance in the measures covering marine litter, contaminants and biological disturbance.

Figure 13. Share of measures addressing MSFD and WFD KTMs



3. Tackling the triple planetary crisis

Based on the adequacy assessments of Member States' programmes of measures, this chapter analyses how Member States' measures address the 11 descriptors of the MSFD and contribute to the achievement of good environmental status and to tackling the triple planetary crisis. For ease of analysis, the 11 descriptors have been split into two categories – **pollution** (D5, D8, D9, D10 and D11) and **biodiversity** (D1, D2, D3, D4, D6 and D7) – although it is clear that measures taken to reduce pollution levels greatly contribute to improving biodiversity. The contribution of MSFD measures to fighting **climate change** has been assessed by looking at measures across all descriptors.

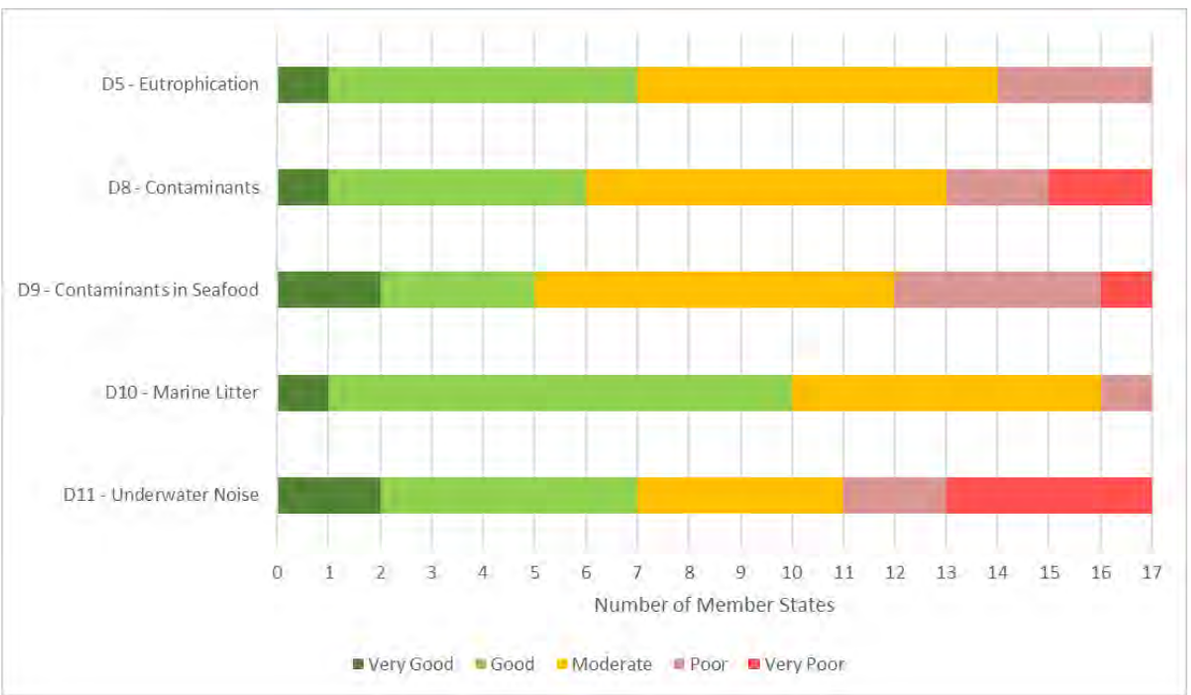
Due to shortcomings in how Member States have determined what is good environmental status (GES) for their marine waters, and what targets are needed to reach GES, at the start of the second cycle of implementation ([107]), notably a lack of quantification of the boundaries between 'GES' and 'not GES', Member States' measures still do not express in a quantitative manner the extent to which they will contribute to reach targets and GES. It is in turn very difficult to examine whether the measures taken by Member States, individually or collectively, will sufficiently reduce the pressures and impacts and thereby achieve or maintain good environmental status. The analysis therefore remains qualitative.

3.1 Towards zero pollution seas and ocean

Reducing water pollution is a key dimension of the EU Green Deal and the Zero Pollution Action Plan (ZPAP). This section covers four major categories of pollution affecting the marine environment: marine litter, nutrients/eutrophication, harmful contaminants and underwater noise. In 2021, the ZPAP set targets for some of these pollution categories at the time when Member States were finalising their MSFD programme of measures. Whilst not many Member States have made direct reference to the ZP targets, they are likely to be an important driver of measures in future WFD and MSFD planning cycles.

Overall, the new or updated measures taken by Member States in this second implementation cycle to address pollution issues are **moderately adequate** in terms of coverage of relevant pressures and contributing to achieve GES and targets ([108]) (Figure 10). **Marine litter is the only pollution descriptor that achieves a good level of adequacy in this assessment.**

Figure 14. Assessment of adequacy of Member States' measures to address pollution issues



([107]) See C(2022)1392 "Commission Notice on recommendations per Member State and region on the 2018 updated reports for Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC)"

[108] A detailed analysis of adequacy of each Member State's programme of measures by descriptor is provided in Section 6 of this report.

3.1.1 Reducing marine litter

The importance of the MSFD to address marine litter is once again confirmed by the analysis of the Member States' updated programmes of measures. **22% of all the measures reported by Member States in this reporting round are related to Descriptor 10** – marine litter, of which 60% target marine litter exclusively (compared to 28% on average for all descriptors). In addition, on average across all Member States, D10 is the only pollution descriptor that achieves a 'good' adequacy score.

The pressure of **marine macro-litter input on beaches** (and to a lesser extent, in the water column) is best addressed in many of the second programmes of measures, while litter on the seabed is often addressed only indirectly. Most of the direct measures to reduce current levels of the pressure tackle macro-litter on beaches, through cleanup actions, or fishing for litter (although this also covers the other elements). **Micro-litter is less clearly addressed by the Member States**, which all link to the lack of clear indicators and guidance. Some Member States ([109]) have included a dedicated measure to indicator-setting or otherwise in their programmes of measures, while for several Member States, micro-litter is only indirectly addressed ([110]) or not even covered ([111]). **Almost none of the Member States have included dedicated measures for the problem of litter ingested by biota** and the issue of indicator-setting on the adverse effects of litter. Mediterranean countries ([112]) have clear targets specified for *Caretta caretta* but either do not include any measure for it, or only measures to increase knowledge base on entanglement for instance. Two Member States in the North-East Atlantic ([113]) include a measure related to Northern fulmar or gannet in their programme of measures. In the Baltic Sea, only one Member State ([114]) mentions both issues but does not translate this into a new measure in its programmes of measures.

Almost all Member States ([115]) have adequately identified the **main sources of litter input** in their marine environment. In this respect, Member States report many measures focusing on activities such as **sewage or other land-based sources** (e.g. industry, agriculture, tourism), for which new EU policy initiatives have been developed (e.g., the Single Use Plastic Directive, the Urban Wastewater Treatment Directive) and several Member States ([116]) have developed **Waste Management Plans**. Many Member States ([117]) also identify **riverine input of litter** as one of the main contributing factors.

Regarding sea-based sources of litter input, virtually all Member States identified fisheries as an important source. Most MSFD-specific measures in the second programmes of measures focus on **litter input from fisheries** (including ghost nets) and do this in an active way, through either clean-up actions (directly reducing current levels of the pressure) or prevention of further input. **Shipping, recreational activities and tourism** are also often mentioned as important sources of litter. Only a few Member States ([118]) specifically added **aquaculture** to this list. **Maritime transport** is mainly addressed through references to initiatives related to IMO, MARPOL, port reception facilities, etc. Relatively few Member States have established MSFD-specific measures to address litter input from shipping. Identification of **marine pollution hotspots** was a recommendation to many of the Member States after the previous round of assessments but has been clearly addressed only by a few Member States ([119]).

([109]) PT, NL, IT, BE, DE, EE and ES
([110]) E.g. SI
([111]) E.g. RO, FR, CY, LT, LV
([112]) such as IT, CY and ES
([113]) NL and DE
([114]) EE
([115]) Except for IE, CY
([116]) Except for IE, CY
([117]) E.g. IT, NL, FR, DE, SI, and EE
([118]) IT, FR, and SI
([119]) E.g. BE, ES

Only three Member States ([120]) have at some point in their text report made reference to the **Zero Pollution Action Plan**, but clear linkages can be seen directly in the additional measures identified in the second cycle ([121]). The **value of regional cooperation and RSCs** is referred to by almost all Member States, although some Member States ([122]) do not link measures to coordinated action through the RSCs, or only marginally.

Good examples

Spain defined several measures linked to the implementation of the Single Use Plastics Directive, for instance: Special tax on non-reusable plastic waste. The purpose of the tax is to promote the prevention of the generation of non-reusable plastic packaging waste, as well as the promotion of the recycling of plastic waste, contributing to the circularity of this material.

Germany defined a measure to identify objects that are particularly problematic for the marine environment on the basis of the results of the scouring analysis, the examination of the stomach contents of fulmars and the results of the pilot monitoring of other marine compartments and possible indicator species.

Spain and Germany defined measures for clean-up activities targeting not only beaches, but seabed and surface water specifically. These are implemented together with communication activities to raise public awareness.

Germany defined a measure to develop containment systems for microlitter. Similarly, also Italy defined a measure for development of purification plants for microlitter (prototypes). Estonia defined a measure specifically focusing on treatment of stormwater and wastewater to reduce the amounts of microplastics.

Contribution to achieving GES

Overall, programmes of measures for marine litter have improved: Member States have **actively taken up the recommendations based on the first programmes of measures** through both existing and MSFD-specific measures. However, almost no Member States have reported that GES is achieved.

Assessment of progress towards GES is most clearly made in relation to macro-litter on beaches. In some cases ([123]), **clear reference to the EU Beach litter threshold** of 20 litter items/100 m coastline is made, although for many Member States such reference is lacking, or only briefly introduced in the text without explaining how it is being dealt with in the programmes of measures ([124]). One Member State ([125]) seems to use different threshold levels, based on which it is concluded that its waters are in GES (at least for macro-litter on beaches) although the values used seem to be higher than the EU beach litter threshold value. One Member State ([126]) stands out as the only one that puts forward an even stricter threshold value for beach litter than the EU-level threshold.

For other litter elements, and especially for micro-litter, **Member States point to the lack of threshold values** (litter on seabed, water column) or even indicators (micro-litter) as well as the lack of baseline data (many Member States only recently started monitoring micro-litter for instance) to explain the difficulty of assessing progress towards GES.

While almost all Member States indicate that GES is not achieved, only very few ([127]) clearly mention when they expect GES to be achieved.

([120]) SE, PL, and LV
([121])For instance a number of measures tackle single plastic uses for the purpose of implementing the Single Use Plastics Directive and an increasing number of direct measures address microliter, thus contributing the Zero Pollution target to reduce plastic litter and microplastic for 2030
([122]) E.g. IT, FI, CY and ES
([123]) BE, RO, SE, LV and PL
([124]) NL, DE, CY and LT
([125]) IE
([126]) PL
([127]) SE, PL and EE (for macrolitter); arguably also FR but less obvious from the report

Three Member States ([128]) reported an exception for D10. One Member State refers to the current level of knowledge regarding microplastics which does not allow a measurable assessment of the current state of marine litter as well as the presence of marine litter may also be of cross-border origin. Two others invoke the transboundary problem of litter input in respectively Baltic Sea (Skagerrak) and Mediterranean (Adriatic Sea), and the need for regional cooperation (through HELCOM Baltic Sea and UNEP Mediterranean Action Plans).

3.1.2 Reducing nutrient losses

Nutrient pollution is clearly an important source of pressure for marine ecosystems as confirmed by the fact that 19% of the measures reported by Member States are related to Descriptor 5 – eutrophication, either exclusively (42% of D5 measures) or in combination with other descriptors (58% of D5 measures). The assessment of Member States' programmes of measures shows, on average, **a moderate-to-high level of adequacy of the measures taken by Member States in this cycle to address eutrophication**.

Pressures from **urban wastewater, agriculture and shipping** are generally well addressed by the Member States, due to longstanding existing European and international legislation. Pressures from **airborne emissions** are less consistently recognised notwithstanding legislation concerning air quality and emissions to air. Relatively few Member States ([129]) have referenced the revised National Emissions Ceiling Directive (which entered into force in December 2016) as a driver for measures in relation to nutrients, although **airborne nutrient inputs are a significant contributor to inputs** especially in enclosed seas such as the Baltic and Black seas. The Directive sets new emission reduction commitments for each Member State for emissions of nitrogen oxides (NOx), sulphur oxides (SOx), non methane volatile organic compounds (NMVOC), ammonia (NH3) and fine particulate matter less than 2.5 µm (PM2.5) in 2020 and 2030 and should therefore be considered as a relevant update for the programmes of measures.

River Basin Management Plans (RBMPs) provide an important focus for measures to reduce nutrient inputs to the marine environment, as many of the key pressures stem from land-based activity. There has been good progress in identifying pressures and developing additional measures since the first cycle, particularly amongst Baltic Sea Member States ([130]). In particular, the 3rd RBMP cycle has provided opportunity to update measures addressing many of the key nutrient pressures, some of these measures being quite innovative. For example, one Member State ([131]) is seeking to promote alternatives to red meat (livestock production is a significant contributor to nutrient loadings).

Only one Member State ([132]) has explicitly referenced the **Zero Pollution target** to reduce nutrient losses by 50% by 2030. The target, however, was agreed at a time when many Member States were finalising their reports on programmes of measures.

Some Member States ([133]) are starting to explore **restoration measures**, recognising the role that healthy marine habitats can play in nutrient cycling and reducing the adverse effects of eutrophication. These include measures to restore biogenic habitats such as blue mussel beds, seagrass beds and saltmarsh.

Unsurprisingly, the region most covered by measures against eutrophication is, by far, the **Baltic Sea** (223 measures on D5 for the Baltic against 85 for the Greater North Sea). Most but not all Member States ([134]) mentioned policy developments within the Regional Sea Conventions. Such regional cooperation is

([128]) RO, SE and SI
([129]) DE, FI, FR, IE, RO and SE
([130]) EE, FI, LV and SE
([131]) FI
([132]) LV
([133]) Defined by SE, BE, FI and DE
([134]) including CY, FR, IT, NL, PT and SI

important, particularly in ensuring a coordinated approach to tackling nutrient pressures and eutrophication.

Good examples

Finland is seeking to improve the use of recycled manure in biogas production and the sustainable use of wastewater sludge products in green infrastructure.

Germany is seeking to restore and preserve seagrass populations in transitional and coastal waters as a contribution to denitrification. A pilot project is initially planned in the Outer Ems area.

Sweden is taking additional measures under the National Emissions Ceiling Directive to reduce atmospheric inputs of nutrients.

Regional cooperation within the Baltic Sea under the auspices of HELCOM has been immensely valuable. Modelling carried out to inform the Baltic Sea Action Plan has identified nutrient reduction targets aimed at achieving GES for D5 and assessed various existing measures to identify the role they can play in meeting the reduction targets. This collaboration has provided much greater clarity to Member States concerning the contribution of existing measures and where additional efforts need to be focused in moving towards GES.

Contribution to achieving GES

There has been **good progress in identifying pressures and developing additional measures to reduce nutrient losses** since the first programmes of measures, however, airborne emissions remain less consistently addressed. Member States are unclear about GES achievement in relation to D5. The gap analyses prepared by five Member States ([135]) are insufficient to identify whether GES is currently being achieved throughout their waters. No Member State has explicitly incorporated WFD assessments within their gap analyses.

Overall, there is **widespread recognition that the response time of marine ecosystems to reduction in nutrient pressures can be slow**, particularly in relatively enclosed systems such as the Baltic Sea where there is already a large pool of nutrients from historic inputs. Furthermore, progress towards GES often requires **cooperation amongst Member States and third countries**.

In these circumstances **exceptions are applied** in relation to Art 14(1)(a) (action required by other Member States) or Article 14(1)(e) (natural conditions which do not allow timely improvement in the status of the marine waters concerned). For example, **most Member States with marine waters in the Baltic** ([136]) **have applied exceptions for D5**, recognising the long time it will take to achieve GES. One Member State ([137]) has not applied an exception, although it acknowledges that GES will not be achieved for many years in its Baltic Sea waters. The same occurs in the North Sea where some Member States have applied exceptions ([138]), but others have not ([139]), although they recognised that GES will not be achieved for at least a decade.

3.1.3 Reducing harmful contaminants

24% of the measures reported by Member States are related to D8 – contaminants and 9% to D9 – contaminants in seafood. The assessment of Member States' programmes of measures shows, on average, **a moderate level of adequacy of the measures taken by Member States in this cycle to address contamination and contamination in seafood**.

([135]) ES, FR, IE, IT, NL and PT
([136]) EE, FI, LT (LT did not formally apply an exception but has assumed that the previous exception applied in 2015 will continue), LV, PL, SE
([137]) DE
([138]) E.g. FR and NL
([139]) E.g.DE and BE

Pressures from **urban wastewater, agriculture, industry and shipping** are generally well addressed by Member States due to longstanding existing European and international legislation, although challenges remain in addressing novel and emerging substances (including pharmaceuticals) and in addressing legacy impacts from persistent contaminants (heavy metals (mercury, cadmium, lead), polycyclic aromatic hydrocarbons (PAHs), Polybrominated diphenyl ethers (PBDEs), PFOS, tributyltin (TBT)). There has been good progress in identifying land-based pressures and developing additional measures since the first cycle. In particular, the **3rd RBMP cycle** has provided opportunity to update RBMP measures to reduce contaminant inputs to the marine environment, although Member States have rarely elaborated on the contribution these WFD measures might make in terms of progress towards GES.

Pressures from **airborne emissions** are less consistently addressed notwithstanding legislation concerning air quality and emissions to air. Increasing controls on **airborne emissions** through the Industrial Emissions Directive and National Emissions Ceiling Directive should contribute to reducing contaminant inputs to marine waters, including beyond 12 nautical miles. Only seven Member States, however, mentioned the **Industrial Emissions Directive** (IED) ([140]) and even fewer ([141]) have referenced the revised **National Emissions Ceiling (NEC) Directive** (which entered into force in December 2016) as a driver for measures in relation to air contamination. The NEC Directive, in particular, sets new emission reduction commitments for each Member State for the total emissions of NOx, SOx, NMVOC, NH3 and PM2.5 in 2020 and 2030 and is therefore a relevant modified existing measure for contaminants (particularly in relation to PM2.5 and contaminants associated with such particles).

Some of the measures proposed by Member States as being applied to **shipping** (environmentally friendly antifouling, emission controls, cleaner ship concepts), linked to the implementation of MARPOL or IMO agreements, are also expected to have a positive impact on Member States waters, including areas beyond 12 nautical miles.

Pressures relevant to D8 are generally relevant to Descriptor 9 (contaminants in seafood). There has been **limited progress in identifying pressures and developing additional measures specifically for D9** since the first cycle. This can be partly explained by the fact that many Member States ([142]) reported being in GES for D9 in 2018 and it is often accepted that D8 measures are sufficient to address D9. It should be noted, however, that Regulation (EC) 1881/2006 was updated in 2023 to cover a broader range of heavy metals and persistent organic substances ([143]). This means that achieving GES has now been put into question in many Member States' waters. However, this update took place in 2023, after many Member States had already updated their programmes of measures.

Only one Member State ([144]) has explicitly referenced the **Zero Pollution target** to reduce contaminant inputs, although the commitment was established in May 2021. For those Member States that submitted their Article 13 reports on time, this may have been because the targets were agreed at a time when the Article 13 reports were being finalised. The targets are likely to be an important driver of measures in future RBMP and MSFD planning cycles.

Policy developments within the Regional Sea Conventions have been mentioned by all Member States except one ([145]). Such regional cooperation is important, particularly in ensuring a coordinated approach to tackling contaminant pressures. In particular, within the Baltic Sea, modelling carried out to inform the Baltic Sea Action Plan has identified **pressure reduction targets for four contaminants** (mercury,

([140]) DE, FI, SE, IE, NL, SI (and CY national legislation)
([141]) Directly mentioned: DE, IE, SE and LV; indirectly mentioned: FR (linked to in measure for regional climate, air and energy plans for preservation of air quality), RO (related measure on managing and reducing diffuse pollution sources), and FI (national air protection programme 2030 which may relate to NEC)
([142]) BE, CY, FI, IE, LV, NL, PT, RO and SI for at least over half of their marine waters
([143]) Commission Regulation (EU) 2023/915 of 25 April 2023 on maximum levels for certain contaminants in food and repealing Regulation (EC) No 1881/2006
([144]) LV
([145]) PT

TBT, PFOS and diclofenac) and assessed various existing measures to identify the role they can play in meeting the reduction targets. This **collaboration has provided much greater clarity to Member States** concerning the contribution of existing measures and where additional efforts need to be focused in moving towards GES.

Good examples

Some innovative measures are starting to be identified to address sea-based contamination. For example:

- Belgium and The Netherlands are introducing measures to phase out the use of lead in recreational fishing gear;
- Finland and Belgium are seeking to evaluate and manage contaminants released from wrecks;
- Germany is seeking to develop a system for tracking and retrieving containers lost at sea;
- France is seeking to reduce contaminant inputs from shipping by supporting local decarbonisation strategies.

Regional cooperation within the Baltic Sea under the auspices of HELCOM has been immensely valuable in developing contaminant reduction targets for mercury, TBT, PFOS and diclofenac aimed at achieving GES for D8 and assessing various existing measures to identify the role they can play in meeting the reduction targets. This collaboration has provided much greater clarity to Member States concerning the contribution of existing measures and where additional efforts need to be focused in moving towards GES. This analysis is also relevant to D9 to some extent on the basis that if GES for mercury can be achieved for D8, this will facilitate achievement for D9.

Contribution to achieving GES

There has been **good progress in identifying pressures and developing additional measures to reduce harmful contaminants** since the first cycle, however few Member States have assessed the contribution of their updated programme of measures in terms of progress towards GES.

Overall, there is **widespread recognition that the response times of marine ecosystems to reductions in contaminant pressures can be slow**, particularly in relatively enclosed systems such as the Baltic Sea where there are historic problems with contaminants such as mercury and PBDEs. Furthermore, progress towards GES often requires **cooperation amongst Member States and third countries**.

Exceptions are applied in relation to Art. 14(1)(a) (action required by other Member States) or Art 14(1)(e) (natural conditions which do not allow timely improvement in the status of the marine waters concerned). For example, **most Member States with marine waters in the Baltic have applied exceptions for D8,** recognising the long time it will take to achieve GES. Two Member States ([146]) have not applied an exception, while acknowledging that GES will not be achieved for many years in its Baltic Sea waters. The same occurs in the North Sea where some Member States have applied exceptions ([147]), but others have not ([148]) although it is recognised that GES is not yet being achieved for a range of substances.

In relation to D9, where GES is not currently achieved, this is often due to **legacy issues associated with persistent contaminants**, for example, mercury and dioxin and dioxin like PCBs in the Baltic Sea. In such circumstances, natural conditions preclude the achievement of GES in the short-term and Member States have applied exceptions ([149]).

3.1.4 Reducing underwater noise

Underwater noise due to human activities at sea can harm marine biodiversity, leading for example to hearing impairment and behavioural disturbances. Despite being the only EU framework where measures

([146]) DE and LV
([147]) e.g. FR, NL and BE
([148]) DE
([149]) PL, SE and PT

can be taken to address underwater noise, only 11% of the measures reported by Member States in their second programmes of measures are related to Descriptor 11.

Apart for one Member State ([150]) which adequately identified relevant significant gaps, the gap analysis is in most cases not reported, poor or not clear. Despite this, **ten Member States** ([151]) **have modified or defined additional MSFD-specific measures in their second programmes of measures**. The relevant pressures (impulsive noise and low frequency continuous noise) are well addressed for six Member States ([152]), poorly addressed for four Member States ([153]) in their programmes of measures' update, and without clarity for two ([154]).

The coverage of the pressure of underwater noise on the marine environment has improved since the first cycle, although **most of the measures are still focused on improving the monitoring efforts and the knowledge base** rather than having a direct impact on the reduction of the input or level of the pressure. The measures that were defined in the first cycle are mostly unchanged, a few have been updated. The first cycle measures seem to be currently implemented in most cases.

On the other hand, the introduction of other forms of energy (magnetic, light, and heat) is still not well addressed except for a few Member States ([155]) developing **research into possible effects of electromagnetic fields** on vulnerable habitats (gravel beds) and associated species[156], **monitoring light pollution** together with noise at one monitoring station ([157]) or taking measures to **reduce loads from heat discharges**[158].

Member States **rely a lot on the frameworks defined at regional level as well as on EU-funded projects** to improve the knowledge base on underwater noise. In general, the programmes of measures of some of Member States from the Baltic Sea ([159]) refer to the research, framework and plans developed collectively in the **HELCOM Baltic Sea Action Plan 2021-2030**, which was supported by EU-funded projects such as BIAS ([160]). A few of them ([161]) have materialised those plans with the definition of D11 specific measures aimed at implementing selected action from the HELCOM Regional Action Plan on Underwater noise actions, for instance implementing appropriate regulations to establish speed limits near sensitive areas or during sensitive times ([162]).

In the North East Atlantic, three Member States ([163]) refer to the **OSPAR North-East Atlantic Environment Strategy 2021-2030**, which is developing specific methodologies and measures for impulsive and low frequency continuous noise. Some Member States from the Mediterranean ([164]) have taken up the **recommendations from ACCOBAMS** ([165]), but no real development has been done to turn these high-level recommendations into a detailed and precise set of measures tuned to the challenges

([150]) BE
([151]) BE, DE, ES, FI, FR, PL, PT, SE, SI, EE
([152]) BE, DE, FI, PL, SE, EE
([153]) ES, FR, LT, PT
([154]) RO, SI
([155]) BE, DE, ES
([156]) BE
([157]) ES
([158]) DE
([159]) DE, SE, EE
([160]) BIAS – Baltic Sea information on the acoustic soundscape, https://biasproject.wordpress.com/
([161]) EE, SE, DE
([162])EE
([163]) BE, ES, and PT
([164]) ES, SI, CY
([165]) Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area, https://accobams.org/

inherent to the Member States' national waters and properly linked to operational targets. Two countries ([166]) refer to the findings and recommendations of QUIETMED ([167]) and QUIETSEAS ([168]) European projects.

For impulsive noise, the **recommendation from the Technical Group on Underwater Noise to file the impulsive noise registry held by ICES** ([169]) is now applied by almost all Member States ([170]), but it seems that Member States do not envision yet how to analyse, leverage and **convert those data into tangible mitigation measures**.

Although it is not always clearly stated whether the measure addresses low frequency continuous noise or impulsive noise, the **most popular concrete measures tackle offshore and coastal infrastructure construction**, either directly through limitation of noise levels or indirectly, for instance through the consideration of underwater noise in Environmental Impact Assessment studies. A few Member States also address **military operations** in their programmes of measures, which goes beyond the requirements of the MSFD.

Good examples

Belgium has addressed a prior gap and has covered impulsive noise from unexploded ordnances (UxO) by focusing on limiting the amount of impulsive noise events. With regards to continuous noise, Belgium has defined a measure focussing on optimizing shipping approach routes during construction/maintenance of offshore wind farms or other offshore infrastructure to avoid vulnerable areas functioning as a biodiversity hotspot, breeding or nursery spots for herring, sharks, rays, etc.

Similarly to other countries in the Baltic Sea, Estonia has committed to actively contribute to HELCOM activities on underwater noise, and to apply HELCOM recommendations and action plan in Estonian waters. This commitment ensures that the management of underwater noise will be at the state-of-the-art of practices in the region, and consistent with the implementation made by the other Member States of the region.

Contribution to achieving GES

Member States' reporting on D11 has improved mainly through the **definition of additional measures**, especially for Member States who had poorly done so during the first cycle. Almost no Member State ([171]), however, has reported that GES is achieved for underwater noise, either for impulsive noise or low frequency continuous noise, and they often state that **it is not possible to estimate whether current measures are sufficient to achieve GES**. Moreover, many Member States ([172]) have not yet defined GES clearly for underwater noise under Article 9 and this is recognised as a limit in their programmes of measures.

Although they are mostly adequate, the contribution of the modified and additional MSFD specific measures defined in the second programmes of measures to meet the operational environmental targets, and ultimately GES, are partially described for most of Member States. The reason is mainly that the linkage with operational targets for underwater noise is rarely clearly made.

3.2 Bringing marine nature back into our lives

Europe's seas cover more than 11 million km^2 by area and range from shallow, semi-enclosed seas to vast expanses of the deep ocean. They host a wide and highly diverse range of

([166]) ES, IT
([167]) Joint programme for GES assessment on D11- noise in the Mediterranean Marine Region, https://quietmed2.eu/
([168]) Assisting cooperation for the implementation of the Marine Strategy Framework Directive on underwater noise, https://quietseas.eu/
([169]) https://www.ices.dk/data/data-portals/Pages/impulsive-noise.aspx
([170]) The Member States that submit to ICES: FI, DE, LT, ES, SE, FR, PT, BE, NL, IE, EE.
([171]) GES reported as not achieved in all Member States except IE.
([172]) BE, DE, EE, ES, FR, LT, PL, PT, SE, SI.

coastal and marine ecosystems with a large variety of habitats and species ([173]). Our quality of life, livelihoods and economies depend on them being in good condition, providing our societies with vital ecosystem services, including food, energy, clean air and climate change mitigation.

Marine biodiversity is suffering, both globally and in EU waters. Marine species, habitats and ecosystems are under a number of pressures from anthropogenic activities, including climate change, extraction of living and non-living resources, pollution and invasive alien species, which accumulate and disrupt essential marine ecosystem processes and food webs, and affect ecosystem resilience ([174]). The EU has not succeeded in halting the loss of marine biodiversity by 2020 ([175]) and recent regional assessments are still painting a bleak picture ([176]).

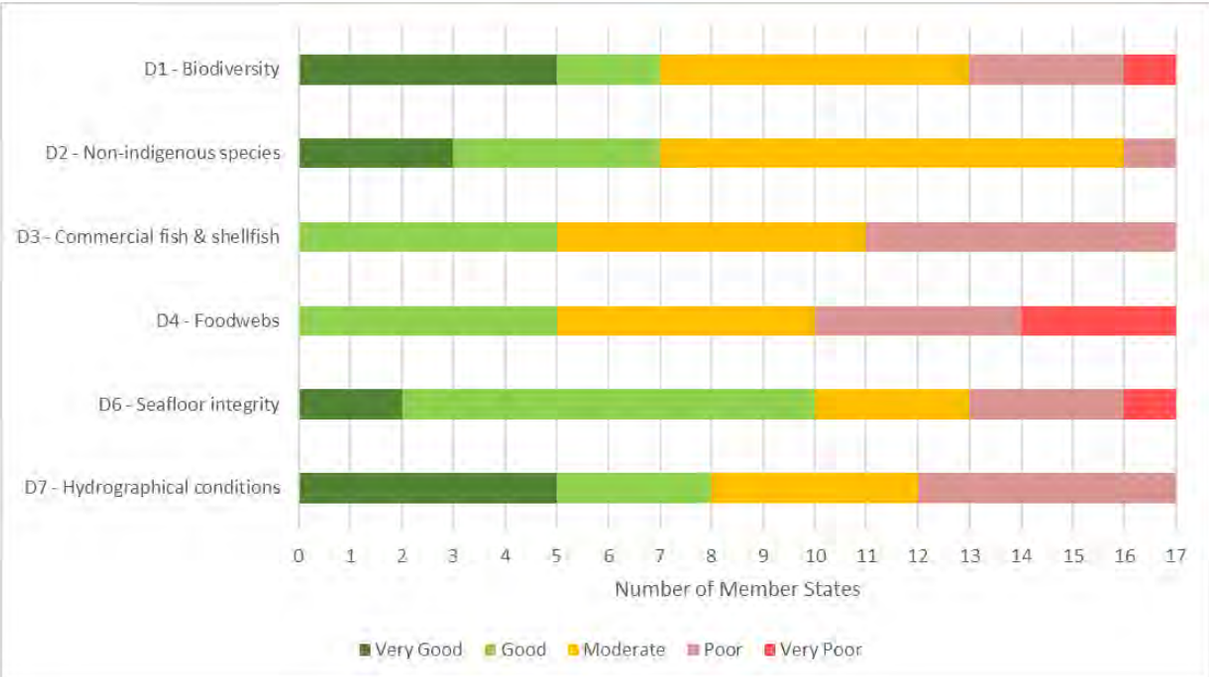
Renewed commitments to protect marine biodiversity have been made in the **EU Biodiversity Strategy for 2030** ([177]) and its commitment to protect legally and effectively 30% of our seas, with one third being strictly protected. MPAs designated under the Marine Directive contribute to this target.

This call was echoed at the global level with the adoption of two historic agreements in 2022-2023: the **Global Biodiversity Framework** ([178]) at CBD COP15 and the **Treaty on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction** ([179]). At the EU level, the adoption in February 2023 of the **Marine Action Plan** ([180]) contributes to delivering on these objectives by calling on Member States to take action to reconcile fishing activities with environmental protection objectives, notably by improving gear selectivity, addressing bycatch of sensitive species, protecting the seabed and helping on transition and knowledge exchange.

Overall, the new or updated measures taken by Member States in this second implementation cycle to address biodiversity issues are **moderately adequate** in terms of coverage of relevant pressures and contributing to achieve GES and targets ([181]) (Figure 11). Based on the adequacy scores, **Descriptor 2 (non-invasive species) is the only biodiversity descriptor that achieves overall a good level of adequacy in this assessment** ([182]) but measures under Descriptors 1 (biodiversity), 6 (seafloor integrity) and Descriptor 7 (hydrographical conditions) also come close to a good level of adequacy.

([173]) State of Europe's seas — European Environment Agency (europa.eu)
([174]) Europe's marine biodiversity remains under pressure — European Environment Agency (europa.eu)
([175]) Report from the Commission on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC), COM/2020/259 final, Brussels, 25.6.2020
([176]) Such as OSPAR's Quality Status Report 2023 or HELCOM Holistic Assessments (HOLAS) 2023 report.
([177]) Communication from the Commission, EU Biodiversity Strategy for 2030 Bringing nature back into our lives, COM/2020/380 final, Brussels, 20.5.2020.
([178]) Conference of the parties to the Convention on Biological Diversity, Decision 15/4. Kunming-Montreal Global Biodiversity Framework, CBD/COP/DEC/15/4, 19 December 2022
([179]) Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction, New York, 19 June 2023
([180]) Communication from the Commission, EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries, COM(2023) 102 final, Brussels, 21.2.2023
([181]) A detailed analysis of adequacy of each Member State's programme of measures by descriptor is provided in Section 6 of this report.
([182]) Although less than half of the Member States' assessments for D2 were concluded as being 'good' or 'very good', many were assessed as 'moderate', only one 'poor' and none 'very poor'. This makes D2 the only descriptor which achieves an overall good level of adequacy for almost all Member States.

Figure 15. Assessment of adequacy of Member States' measures to address biodiversity issues



3.1.5 Protecting and restoring marine ecosystems

Protecting marine life

31% of all measures reported by Member States in their second programmes of measures are related to D1 – biodiversity covering all species groups and pelagic habitats. Descriptor 1 is the descriptor most covered by measures, confirming that biodiversity is a concern to Member States and that increasingly Member States are linking their measures addressing pollution and other pressures to the achievement of GES under Descriptor 1.

The most frequently reported direct pressures on biodiversity are the **extraction of wild species (23%), disturbance of species (21%), physical disturbance of the seabed (12%) and physical loss of the seabed (10%).**

Measures addressing the disturbance of species and the physical disturbance or loss of the seabed are often of a direct nature. The most common measure under D1 is the implementation of **marine protected areas (MPAs)** in areas of high human activity. These MPAs frequently plan to regulate activities which disturb and damage the species and habitats, such as tourist activities (recreational boating and water sports) and fishing, particularly with bottom-trawling gear. As well as protection, Member States report spatial measures which aim to **reinstate and restore vulnerable habitats** in areas of degradation. MPAs can potentially have a significant impact on pressures, depending on the size of the MPA and on whether management measures are implemented or planned. This information is seldom reported by Member States beyond simply stating that harmful human activities will be controlled.

Member States frequently report the expansion or designation of Natura 2000 sites as a measure under Descriptor 1 to address biodiversity, making direct reference to the **Habitats and Birds Directives**. In rarer cases, Member States have included in their programmes of measures the designation of MPAs which are not Natura 2000 sites. These are designated either under national legislation ([183]) or international protection regime ([184]) and are reported by the Member States as also contributing to the

([183]) E.g. SI reports the designation of a protected area for the protection of detritus beds through national legislation.
([184]) E.g. FR is working on reducing the risk of cetacean vessel collisions by submitting for a Particularly Sensitive Sea Area (PSSA) under the International Maritime Organisation

achievement of GES under the MSFD. Most of the Member States ([185]) mention links to the **Biodiversity Strategy to 2030** in their programmes of measures but links are, however, not clearly made to the targets of protecting 30% of EU seas by 2030, including 10% in strict protection. Only two Member States ([186]) have clearly mentioned the extent coverage of new MPAs reported under MSFD programmes of measures.

Species-specific measures tend to focus on fish, marine mammal, and bird species, while measures for cephalopods, marine reptiles, and pelagic species (e.g. plankton) are rarer. The most commonly identified activity causing pressures on species is commercial fishing and the main pressure on seabirds and marine mammals in most European waters is **incidental bycatch**. Relevant measures, for example the use of specialist gear to reduce the chance of bycatch or the implementation of new/extended protected areas, are put in place to mitigate this pressure. Gear adaptations or changes concern both trawl fisheries ([187]) and gillnet fisheries ([188]), especially for birds and cetaceans. These measures typically fall in the scope of the Technical Measures Regulation ([189]), which supports the objective of the MSFD in terms of species and habitats protection. Regulations inside MPAs to protect species include regulating fishing activities by making use of the CFP Article 11 joint recommendation mechanism ([190]), increased monitoring of fishing activities and training of fishers to improve recording and avoidance of bycatch incidents ([191]).

The main threat to fish species is **extraction beyond safe levels** and, besides measures taken under D3 for the health of commercial fish populations, the spatial conservation measures taken by Member States under D1 can also benefit the health of commercial and non-commercial fish species, notably by protecting nursery/spawning grounds ([192]) or reducing seabed disturbance ([193]). Obstacles in migratory corridors of fish is also reported as an important threat to the health of fish populations. Four Member States ([194]), including three in the Baltic, report **measures which aim to reduce blockages to fish migratory corridors** and ensure their health and maintenance, including by using acoustic monitoring to determine and protect important migratory pathways for fish ([195]), removing old barriers (e.g dams) ([196]) or re-opening migratory pathways and stimulating fish populations in estuarine/coastal areas ([197]). In the Mediterranean, measures for coastal fish include preventing negative impacts from aquaculture ([198]).

Measures for marine reptiles are rare. Some Member States focus on raising awareness of vulnerable turtle species through the development of management plans ([199]). Others address one of the main threats to the species, incidental bycatch, through schemes to improve the monitoring, risk assessment and response to turtle bycatch[200] or the training of fishers ([201]). One Member State ([202]) also covers the risk of vessel collision with turtle in its training measure. **Measures specifically for cephalopods are not reported** by any of the Member States to date, and Member States rather

([185]) BE, CY, DE, EE, FI, FR, IE, IT, LV, NL, RO, SE.
([186]) NL, LV
([187]) SE
([188]) BE, PL
([189]) The Technical Measures Regulation (EU) 2019/1241 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures.
([190]) DE
([191]) IT, PT (through the CetAMBICion project)
([192]) BE, EE, FI, FR
([193]) See section on 'seafloor integrity' measures
([194]) EE, BE, PL, LT
([195]) LT
([196]) PL
([197]) EE
([198]) SI
([199]) PT, ES
([200]) ES
([201]) FR
([202]) FR

regularly group cephalopods with fish species and apply measures to both species groups. **Pelagic habitats are also often overlooked under D1**, but efforts are made under D5, D8, D9 and D10 to return the water column habitat to good condition. Species which are important to this habitat such as phytoplankton and zooplankton are not assigned specific measures by any Member States, and gap analyses are rarely completed with regard to their status. Only two Member States ([203]) report a clear status update for plankton, both determining that GES has not been achieved. Neither, however, has taken measures to progress towards GES for these species.

Input of substances, anthropogenic noise, and energy into the marine environment are also mostly addressed by spatial measures under D1. The **regulation of human activities** within MPAs will indirectly reduce the amount of input into the area but will not directly target the sources of inputs. Direct measures targeting activities are mostly found under relevant pressure descriptors but some Member States ([204]) have taken measures targeting activities to reduce their impact on biodiversity under D1. Most **measures that directly target a pressure/ human activity under D1 concern fisheries**, e.g. reducing the area of seafloor that can be trawled ([205]), enforcement of a ban on gillnetting and rammel net fishing ([206]) and the application of technologies and specialised gear to reduce bycatch ([207]), as discussed before. Other activities addressed by D1 measures include fines for exceeding permissible nutrient concentrations in wastewater ([208]), increased regulation of damaging tourist activities ([209]) and measures to reduce pollution impacts from ships ([210]).

([203]) RO, SE
([204]) e.g. SE. PL, BE, EE, and FR
([205]) SE
([206]) BE
([207]) EE
([208]) PL
([209]) FR
([210]) SE

Good examples

Germany reported two restoration measures: restoring rocky reefs in areas where fisheries no longer pose a threat and areas which encourage reef interconnectivity, and fostering the reintroduction of *Sabellaria* reefs in the North Sea. These habitats will then be protected, allowing natural state to be restored and providing refuge for unique communities of other organisms.

Slovenia defined a measure to implement assigned tourist boat anchoring sites to ensure that the environmental impact that comes with anchoring is kept in a concentrated area.

Belgium includes measures tackling fish migration bottlenecks through the removal of human barriers such as dams, the tagging of several fish and shark species to identify frequently used areas, and the development of a barrier map for seabird migration routes to ensure that threats such as wind energy turbines are not constructed in migration pathways. These measures have targeted aims which can be carried out through carefully designed practical methodologies, making them practical and achievable.

Sweden has taken some measures to reduce the impact of shipping on biodiversity, reducing the use of biocide containing anti-fouling paints, and the active phasing out of two-stroke engines and carburettors on recreational boats. All of these measures are targeted, achievable, and will have a direct impact on addressing the pressures of species and habitat disturbance.

Marine Protected Areas

Although often reported in little detail, MPAs can be considered practical and direct measures if they have clear conservation objectives and management measures in place. Several Member States report the planned designation of protected areas for specific habitats and species such as meadows, rocky reefs, and detritus beds. These MPAs have been designed with the health of these specific habitats in mind, often in response to requirements of the Habitats Directive. Regulations can be tailored to fit the needs of these vulnerable environments. Examples include the restriction of fishing activities over *Zostera* beds to avoid gear becoming caught on the plants and damaging or destroying them (Slovenia).

MPAs can also aim to provide a specific service for species, making regulations more targeted and therefore likely to be successful. One such example is the provision of a refuge for fish, marine mammals and seabirds (Germany). Within these MPAs the habitats used by these species for rest will be restored and maintained to allow respite from areas of high anthropogenic activity.

Contribution to achieving GES

Member States that showed progress since the first cycle ([211]) were those that carried out a **thorough gap analysis**, and identified areas in which further measures were required to ensure biodiversity improvement. As biodiversity is such a large topic to cover, without an effective gap analysis to work from, measures reported in the updated Programmes of measures can end up very vague, reducing their ability to have any real effect on progress towards GES.

Overall, **progress made under D1 since the first cycle has been limited**. Five Member States report GES as having been achieved for seabird or commercial fish ([212]). One Member State ([213]) report GES to be achieved for large marine mammals. Five Member States ([214]) report that measures reported in the first cycle of implementation were not sufficient to meet GES and five Member States ([215]) do not provide an update on progress towards GES, due to a lack of data. There are many examples of Member States ([216]) failing to complete an effective gap analysis and therefore implementing only overarching, cross-cutting and vague measures for D1. Furthermore, within Member States, certain species groups (mammals, birds, fish to some extent) receive the majority of focus, whilst others (cephalopods, reptiles) are overlooked.

([211]) SE, BE, DE, EE, FI, and FR
([212]) LT, LV, PL, BE, EE
([213]) IE
([214]) FI, FR, DE, NL, and SE
([215]) IT, ES, SI, RO, and PT
([216]) LT, LV, NL, PT, RO, SE, SI, ES, IE, and IT

10 Member States ([217]) reported exceptions for D1. The majority of the exceptions are justified by action or inaction for which the Member State is not responsible and to a smaller extent natural conditions. In two cases, the Member States ([218]) reported the failure of measures from the previous programmes of measures as a justification for not reaching GES.

Restoring the seabed

28% of all measures are reported as addressing D6 – seafloor integrity. As with Descriptor 1, the overarching nature of seabed integrity means that all biological, physical, and substance input pressures have an impact on this descriptor, whether directly or indirectly.

Across Member States, there is a **clear focus on the physical preservation of the seafloor.** Biological pressures, such as the extraction of mobile species which use the seafloor, also have an impact on seafloor integrity, but these pressures tend to be addressed more through D1 species-specific measures.

Physical disturbance and loss of the seabed habitat are addressed by a range of measures including: Marine Protected Areas, habitat restoration, limitation to mobile bottom fishing, boating regulations, the removal of lost fishing gear, and the implementation of best practice dredging methods.

Designing **Marine Protected Areas** specifically to protect seabed habitats means that conservation measures within the areas are tailored to the relevant habitats. In some cases, this may be the banning of fishing in the area to prevent further damage to fragile organisms, and in others it may be the restoration or recovery of specific habitats. Although most MPAs reported under MSFD have been designated to protect specific habitats covered by the Habitats Directive, a few Member States ([219]) report protection or restoration plans of **seabed habitats not covered by the Habitats Directive**.

A number of measures focus on **active habitat restoration** (passive and active), e.g. restoration of oyster reefs, *Saballeria* reefs, *Zostera* beds and Posidonia meadows ([220]). These restoration measures improve not only the physical health of the seabed but also of the biological communities and species which these habitats support and the ecosystem services associated. One Member State ([221]) commits to restricting traditional gangui fishing over *Posidonia* beds as the gear damages the fragile plants.

Most Member States have identified **bottom-contacting fishing** as the main threat to the health of seabed habitats in their waters. Some of these Member States subsequently develop measures which aim to reduce the impact of current bottom-contact fishing levels or reduce levels in vulnerable areas. These measures include the implementation of best practices and promotion of selective gears, the designation of new MPAs and the strengthening of existing ones with measures specifically restricting mobile bottom fishing. In addition, three Member States ([222]) explicitly report measures which aim to **reduce current levels of bottom-contact fishing throughout national waters**, without the use of spatially-limited protection.

Seven Member States ([223]) report measures which regulate and improve the way in which activities take place, ensuring that there is no lasting effect on the seabed. Threats such as **lost fishing gear**, which can cause ghost fishing and topographical change in the seabed structure, can be removed through efficient schemes, whilst best practice guidelines can reduce the chances of fishing gear being lost in the first place. Other examples include improved management and **sustainable use of materials (dredging)** and moratoriums on recreational fishing of vulnerable bottom-species. Four Mediterranean

([217]) BE, EE, FI, FR, IT, LT, PL, RO, SE and SI
([218]) FI and PL
([219]) BE (gravel beds), NL (soil beds), PL (Fucus and Fucellaria medows), SI (detritus beds)
([220]) NL, PL, BE, DE, SL, SE and FI
([221]) FR
([222]) PL, SE, and FR
([223]) PL, SE, SI, BE, FI, FR, and IT

Member States report measures specific to **anchoring** which limit the area in which boats are permitted to anchor ([224]).

Finally, a few Member States have identified certain blue economy developments as potential threats to seabed integrity, for example the installation of **wind turbines or underwater cables** and have introduced mitigation measures. These measures include preparing and implementing minimum requirements for Environmental Impact Assessments, to be submitted before blue economy development ([225]) and the mapping of vulnerable seabed habitat types to avoid the installation of cables causing disturbance and damage ([226]).

Good examples

Protected areas for vulnerable seabed habitats are reported as measures across many Member States. These include *Zostera* beds, detritus beds and rocky reefs in Slovenia, *Sabelleria* reefs in Germany, and gravel beds in Belgium.

Within these protected areas, damaging human activities such as bottom-gear fishing or the dropping of anchors will be restricted or banned to allow the passive regeneration of these fragile habitats. Within some protected areas, Member States also plan to implement active restoration. This includes reef reconstruction in Germany, and the recovery of Oyster beds in Belgium. This method is used when the habitat is degraded to a point at which simple passive recovery alone will not be sufficient. Once reinstated, these habitats will be protected to ensure they have the best chance of returning to their natural state. Member States often refer to best practice guidance which they intend to use and successful examples which will be followed.

Measures which aim to alter the way in which certain practices are conducted are also often practical. Examples include the implementation of best environmental techniques for dredging in Finland, ensuring that in areas where trawling is permitted, it is conducted in a way which has the least impact on the seabed environment.

Another example is a reduction in the trawl-swept areas in Sweden through the promotion of low impact and selective gears. These selective gears are often in the best interest of the fishermen, as it reduces the rate at which bycatch species are caught, which cost them time and money. The encouragement of their use is therefore good for the economy, and for the seabed environment.

Contribution to achieving GES

Some progress has been made for D6 since the first cycle, in particular with regard to measures aimed at reducing the harm caused by mobile bottom-contact fishing methods. An area in which less improvement has been seen is the identification of pressures impacting the biological health of the seabed.

GES threshold values for D6 were adopted only in 2023, too late for their integration into the programmes of measures assessed. In some cases, Member States ([227]) mentioned that they were awaiting the thresholds in order to design effective measures. Regarding **progress towards GES**, seven Member States do not provide an update for D6, with one Member State reporting that there is not enough data to determine the status of seabed habitats ([228]), and the remaining six not providing a detailed current status update within their gap analyses ([229]). Nine Member States provide an update on status for D6: GES has been met for D6 in one case ([230]); in three cases ([231]), GES has been partially met (e.g. met in some habitats but not others or met for physical loss but not disturbance); and in six cases ([232]), GES has

([224]) CY, IT, FR and SI
([225]) EE
([226]) BE
([227]) NL and PL
([228]) FI
([229]) CY, DE, ES, PT FR, and IT
([230]) EE
([231]) NL, SI, and IE
([232]) LT, LV, PL, SE, SI and BE

not been met overall for D6. Only four Member States ([233]) have provided and adequate gap analysis, with the remaining Member States often reporting overarching and non-specific D6 measures as a result of inefficient identification of gaps in progress.

Only two Member States ([234]) reported an exception under D6. Exceptions reported were justified mainly by action or inaction for which the Member State is not responsible. In addition, the Member States reported an exception justified by natural conditions and one by economic or social activities fulfilling specific obligations of public services.

Restoring food webs

In the updates of their programme of measures few Member States reported modified or new measures addressing food webs. 19% of all measures cover D4 – food webs but when looking at measures that cover only D4, this falls to only 1%. As for D1, all pressures can also be indirectly linked to food web health. Often, the measures reported under D1 and D6 are also reported as relevant to D4 by proxy, as biodiversity, seabed integrity, and food web health are intrinsically linked. D4-specific measures are much rarer.

The most commonly addressed pressures by measures under D4 are **physical disturbance and loss of the seabed, biological disturbance of species and extraction of species**. All these pressures have an impact on the health of the local food web by affecting the populations making up each trophic level, and therefore the web in its entirety.

There are **very few examples of practical direct measures under D4**. Most measures reported for food web health are those which aimed at biodiversity in general. These include the designation or expansion of protected areas, or species-specific measures such as the mapping of bird migration routes. Whilst these measures to preserve populations of vulnerable species are important for maintaining populations and thus the local food web, the overall impact on food webs can be more indirect.

Measures which directly address the imbalance of food webs focus on **extraction and disturbance of entire trophic guilds** to ensure that all guilds are sufficiently healthy not to impact their position in the trophic levels. A large proportion of commercially and recreationally targeted fish hold a high trophic level as these tend to be the larger (and therefore more commercially valuable) animals. Removing these species from the food chain will have sometimes irreparable effects on the species lower down the food chain and on the habitat.

Measures directly relevant to D4 therefore include **measures targeting commercial fishing,** for instance by restricting fisheries at a certain trophic level (e.g. of predatory fish or forage fish), restricting fisheries of commonly fished species to ensure the health of their trophic level ([235]), or reducing fishing levels overall ([236]). Measures which reinstate or improve fish migratory routes are also directly relevant to food web health as they allow populations of migratory fish to continue ([237]). Certain species-disturbing activities, such as **tourism or offshore constructions**, can be also so disturbing that some species will flee the area, therefore impacting the balance of local food webs. Very few measures have been adopted to address this in the context of D4, however, and the only clear examples identified have been reported under D1, e.g. regulation of tourist recreational activities within protected areas ([238]).

([233]) LV, PL, DE and EE
([234]) FR and PL
([235]) IT and FI
([236]) SE, FR, EE and PL
([237]) EE, BE, Pl and LT
([238]) FR

Good examples

One measure from Finland aims to collaborate with other Baltic regions to promote the health of predatory fish populations through fisheries management. As the largest and most energy expensive organisms in the food chain, predators are key to ensure that populations of prey species remain controlled and are also not easily compensated for by the remainder of the food web. Therefore, their protection will allow the top of the food chain to remain stable.

In Italy one measure implements a Moratorium on recreational fisheries for specimens of high conservation value species. This measure directly reduces the extraction of these species, such as red cernia, which is a predatory species and therefore is also valuable in the local food chain.

In Estonia one measure aims to reduce the number of fishing gear licenses issued to fishermen in Estonian maritime areas in order to reduce fishing efforts to a level that possible under GES. The measure aims to reduce the amount of fishing gears at use in Estonian waters whilst considering and reducing any possible socio-economic impacts.

Contribution to achieving GES

No noticeable progress has been made for D4 since the first cycle with regard to the contribution of the measures to GES achievement. Food web health remains a consequence of actions aimed at species and seabed integrity. As a result, gap analyses for D4 are infrequent and often GES for food web health has not been defined by the Member State, meaning **no assessment of current status can be made**.

Only two Member States ([239]) reported an exception under D4. Most of the exceptions referred to action or inaction for which the Member State is not responsible; only one exception referred to natural conditions but the Member State did not provide enough information to justify it, including an approximate timeline for GES.

3.1.6 Replenishing fish and shellfish populations

16% of all measures reported by Member States in their updated programmes of measures relate to D3 – commercial fish and shellfish. Logically, **fishing is consistently identified as the main activity causing the pressure for D3**.

All Member States addressed the relevant pressure – extraction of, or mortality/injury to, wild species (by commercial and recreational fishing and other activities), to some degree. **Not all stocks and sources relevant to this pressure, however, are covered across programmes of measures**, in particular in relation to the coverage of both CFP-managed stocks and local/nationally-managed stocks and fishing pressure from both commercial and recreational fisheries.

The management measures implemented through the **Common Fisheries Policy** aim to ensure that commercial fish and shellfish populations are exploited at levels which are sustainable over the long-term. **Almost all Member States have incorporated CFP-related measures** into their programmes of measures ([240]). Some have done this at a high level (i.e. CFP and associated regulations are reported as a single measure), others have reported specific regulations as individual measures (e.g. updated Technical Measures Regulation, EMFAF regulation and multi-annual management plans for particular species). A number of Member States have also incorporated existing **national regulations for fisheries** into their programmes of measures ([241]), and some have specific measures directed at local or inshore stocks ([242]). This provides confidence that local or nationally-managed stocks are also addressed.

([239]) FR and LT
([240]) Member States that did not clearly report CFP as a measure were: LT, LV
([241]) CY, DE, FI, FR, IE, IT, SE
([242]) BE, DE, ES, FI, FR, IE, IT, SE

A few Member States also identify **other pressures relevant to D3**. For example: one Member State ([243]) identifies eutrophication as potentially affecting the recovery of the Baltic cod, and another ([244]) identified eutrophication and physical disturbance of the seabed as relevant pressures and has identified measures to address water quality, beach construction and dredging, which are relevant to the coastal and migratory stocks in its waters.

While D3 builds on the CFP and its key concept of maximum sustainable yield (MSY), it also goes further by requiring that these populations also include older and bigger animals. In general, Member States' measures in their updated **programmes of measures focus on reducing the fishing mortality rate and increase the spawning stock biomass, rather than on improving population age/size distribution**. Eight Member States ([245]) defined **measures to address age/size distribution** to some extent, for example (updating) minimum size regulations, measures to reduce the catch of juvenile fish, regulations to promote more selective fishing, and updates to mesh size and configuration in gillnets and trawl codends. For the Member States that used population age/size distribution to define GES, some include measures specifically focussed on improving age/size structure ([246]), whereas others do not ([247]). Not all details of measures were available, however, e.g. the content of local management plans has not been assessed, and these may include management that addresses this issue.

Good examples

Ireland reported existing measures to manage local stocks including: support sustainable inshore stocks; effort management for crab fisheries; effort management of scallop fishing; and protection measures for shellfish species.

Italy reported existing measures covering local stocks and recreational fishing including: local management plans for management units; management of bivalve molluscs fisheries; management of sport and recreational fisheries; and an additional MSFD specific measure for a moratorium on recreational fishing of specimens of high conservation value species such as groupers and cob, by recreational and non-professional underwater fishing activities.

Sweden introduced a new measure to 'Promote a sustainable size distribution of coastal fish communities to retain important ecological functions in the food web'.

Romania has an existing measure to implement control requirements on turbot nets used in the fisheries sector (material, mesh size and thickness).

France introduced new measures in the second cycle specifically focussed on management of local stocks and controlling recreational fishing pressure. In addition, France updated its environmental targets so that they focus on reducing pressures (adjust fishing mortality, adapt catches) with the aim of moving towards GES.

([243]) PL
([244]) FI
([245]) ES, IE, FI, SE, EE, BE, RO, CY
([246]) BE, FI, EE, RO, CY
([247]) DE, IT, LT, SI

Contribution to achieving GES

The **majority of the Member States have made limited or no progress** with the programmes of measures for D3 ([248]). Three countries ([249]) have made some progress, and only two ([250]) are considered to have made good progress.

Six Member States reported an exception for D3 ([251]). Exceptions reported are justified in different ways, e.g. natural conditions, Member State not responsible, action needed by another Member State or by non-EU states (all of which are considered appropriate for D3 ([252])).

3.1.7 Mitigating invasive alien species

Only 10% of all measures reported by Member States in their updated programmes of measures relate to D2 – non-indigenous species (NIS), however the ratio between measures addressing several descriptors and measures addressing only D2 is high (over 50%) meaning that many D2 measures are measures focused only on the issue of NIS. In addition, on average across all Member States, D2 is the only biodiversity descriptor that achieves a 'good' adequacy score ([253]).

Member States consistently identified the two key pathways of NIS introductions, namely shipping (ballast water and hull fouling) and aquaculture. Nearly all of the Member States reference Regulation (EU) No 1143/2014 (Prevention and management of the introduction and spread of invasive alien species) in their programmes of measures in relation to D2 ([254]) and/or Regulation (EC) No. 708/2007 concerning the use of alien and locally absent species in aquaculture ([255]).

Shipping is widely recognised by the Member States as **the main pathway of introduction**, and most Member States have in place measures relating to the implementation of the IMO Ballast Water Convention. A few Member States from the Mediterranean ([256]) have made specific reference to the challenges brought by the Suez Canal, a major source of introduction of non-indigenous species. Managing biofouling on ship's hulls was addressed by some Member States ([257]).

Aquaculture is another activity which carries risks when it comes to NIS introductions and the development of aquaculture activities ([258]) could increase levels of intentional introductions of NIS for aquaculture purposes and unintentional introductions via 'hitchhiking' species. The 2021 **European Commission's Guidelines for Sustainable Aquaculture** refers to the need to ensure that mitigation measures are in place in line of EU environmental legislation (including MSFD) to ensure that '*aquaculture activities do not significantly harm ecosystems or biodiversity*', with a specific reference to Regulations

([248]) FR, IE, FI, SE, EE, BE, RO, CY, NL, DE, IT. Some countries have made some progress (EE, FI, BE), and only a few are considered to have made good progress (FR, SE).
[249] EE, FI, BE
[250] FR, SE
([251]) FI, LT, PL, RO, SE, SI
[252] While RO used the exception justification 14(1)(d) 'economic or social activities fulfilling specific obligations of public services' which is not fully appropriate, their justification ('*Given that the commercial stock is divided across the marine region or subregion, the achievement of the GES for Descriptor 3 depends on the mode of action of all Black Sea states*') is more in line with exception 14(1)(a) 'action or inaction for which the member state is not responsible'. A reporting error is therefore suspected.
([253]) Although less than half of the Member States' assessments for D2 were concluded as being 'good' or 'very good', some of these 'good' or 'very good' assessments received high scores; in addition many MS were assessed as 'moderate', very few 'poor' and none 'very poor'. On average, therefore, the total score for the D2 assessments is the only one that reached the threshold of 60, which is the boundary between a 'moderate' and 'good' level of adequacy.
([254]) For example, NE, EE, SE, SI
([255]) For example, DE, IE, SE
([256]) CY, SI
([257]) for example BE, IT and PL
([258]) E.g. European Green Deal, Farm to Fork Strategy, Sustainable Blue Economy Policy, etc.

(EC) 708/2007 and 1143/2014, and encouraging the set-up of '*management practices [for] the prevention of escapees [...] including their potential for becoming invasive*' ([259]).

Mitigation of this risk is largely through existing regulations mentioned above. Some Member States have taken additional measures, including **early detection through monitoring in hotspots** including aquaculture areas ([260]).

Other pathways of introduction, such as **recreational boating, angling**, and accidental releases, were identified by some Member States and corresponding measures have been implemented. For example, some Member States ([261]) addressed **hull fouling on recreational vessels** by implementing the IMO biofouling recommendations or creating guidance and regulatory frameworks for managing biofouling on recreational vessels. Another Member State ([262]) implemented **an action plan to reduce the risk of introduction and spread of invasive alien species transported by recreational boating** and watercraft activities. Other examples include measures which provide training and raise awareness of mitigating against NIS introductions with the recreational boating and angling sector ([263]).

One Member State ([264]) also recognised the potential role that **offshore structures such as wind farms** might play as stepping-stones for NIS spread, however, no mitigation measures were implemented. With the increase in offshore structures being planned, such as offshore wind farms, this could be an important future pathway to consider.

Early warning systems which rely on frequent monitoring/surveillance along with an alert system and appropriate plan to respond to introductions are crucial for the rapid detection of NIS and increasing the chances of eradication. Several Member States ([265]) set out measures to implement early warning systems.

Finally, some Member States have **adapted measures under existing instruments** to prevent new introductions from water pathways ([266]).

Good examples

Poland is implementing a measure relating to educating aquarists and anglers about the dangers of NIS releases.

Ireland is implementing an 'Invasive Alien Species Recreational Boating and Watercraft Pathways Action Plan'.

Estonia is yet to implement a measure regarding early warning systems, but is investigating the use of environmental DNA techniques as a potential early warning system. This is an emerging technique which has the potential to detect NIS introductions from water samples. However, it requires further testing and may take some time to become effective.

Contribution to achieving GES

Measures in the second programmes of measures have generally filled gaps which were identified in the first cycle and **progress has been made in setting and implementing appropriate measures** aimed at achieving GES for D2. GES was described as being achieved in some countries ([267]) but maintaining it remains a challenge given the need for international cooperation to reduce NIS introductions. Some

([259]) Communication from the Commission, *Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030*, COM/2021/236 final
([260]) ES, PT,
([261]) DE, LV and SE
([262]) IE
([263]) ES and LT
([264]) BE
([265]) DE, ES, IT, LT, LV and SI
([266]) E.g. the Invasive alien species recreational boating and watercraft pathways action plan by IE; measure to address ballast sediment from ships to avoid further input and spread of non-indigenous species by SE.
([267]) For example IE, NL

Member States ([268]), particularly those with territorial waters within the Baltic Sea or Mediterranean Sea, identified such a need for international cooperation.

Many Member States only report against the primary criterion for D2 (D2C1 "Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems"). A small proportion of Member States report against both the primary and secondary criterion (D2C2 and D2C3) ([269]).

Four Member States ([270]) apply for an exception for D2. Exceptions reported were justified, in different ways, mainly action needed by another Member State or by non-EU states, natural conditions and natural causes.

3.1.8 Limiting permanent alterations to hydrographical conditions

D7 is linked to pressures that can permanently change physical characteristics of the water column (e.g. currents, waves, temperature, salinity, depth etc.) and affect marine ecosystems, including benthic habitats and the species that depend upon these habitats. Climate change is also a powerful driver of such changes. These pressures are mainly caused by large infrastructure projects (e.g. dams, costal works, dredging, aggregates extraction, windfarms etc.) and projects and activities, both marine and terrestrial that can change energy fluxes, flows, freshwater supply, salinity directly or indirectly (e.g. wind and other atmospheric parameters). Such permanent alterations are likely to affect ecosystem mainly in coastal and shallow areas.

8% of all measures reported by the Member States in their updated programmes of measures relate to D7. It is the least well covered descriptor of all, however, overall, measures for D7 have a moderate-to-high level of adequacy.

The main measures to control the pressures related to D7 are linked to the **River Basin Management Plans** for terrestrial and coastal projects (e.g. by controlling the flow of fresh water or sediment from rivers), and to **strategic environmental assessment (SEA) and environmental impact assessment (EIA)** requirements for all projects and activities, which is adequate provided that impact assessment regulations actually refer to the achievement of GES for D7 as a frame of reference for the assessments. As several causes can influence hydrographical conditions, **Maritime Spatial Planning**, coupled to modelling and SEA, is a strong instrument to address cumulative permanent alterations of hydrographical conditions linked to projects and activities and to climate change.

While most Member States adequately report regulation of authorisations through EIA procedures, only a few elaborate on their relevance to achieve GES for D7. Only some Member States ([271]) took benefit of rules laid out in the **Maritime Spatial Planning Directive** (Directive 2014/89/EU) to assess and control cumulative effects that could lead to permanent alteration of hydrographical conditions. Also, only a part of them adequately refer to the RBMPs ([272]). Only a few Member States ([273]) explicitly based their programmes of measures update on an inclusive baseline scenario or forward-looking vision of the development of large-scale activities such as **windfarms and marine aquaculture** which are supported by EU policies, although this is the best way to identify and quantify future pressures to be addressed.

At regional level, some NEA Member States have reported that OSPAR has provided significant support to implementation of MSFD for D7 by providing a common approach and recommendations. However, cross-border and regional coordination is still weak.

([268]) For example, EE, SI
([269]) DK, EE, ES, LT, RO and SI
([270]) CY, LT, PL and RO
([271]) E.g. BE, SE and ES
([272]) E.g. DE
([273]) E.g. BE and NL

Good examples

In its gap analysis, Belgium adequately identifies existing pressures or future pressures, including windfarms, energy atoll, sand extraction, dredging, and coastal defense projects. Based on these scenarios, Belgium reports possible gaps, including gaps in addressing relevant pressures individually or cumulatively, and in addressing these pressures at planning level (Strategic Environmental Assessment of the Belgian maritime spatial plan ([274])). To address these gaps, Belgium has defined a measure intended to develop a methodology for the assessment of cumulative impact.

In its gap analysis, even if GES for D7 is reported as achieved, Finland explains whether and how future socio-economic developments are taken into account to determine future environmental pressures. Finland has carried out an assessment of future activities likely to cause pressures linked to hydrographical changes; this assessment duly takes into account the likely influence of climate change.

Contribution to achieving GES

Only a few Member States ([275]) have made progress in addressing the topic of hydrographical conditions: GES is still often not determined at criteria level and the status of marine areas against GES is not or partially assessed. As a result, most gap analyses are not sufficient to define adequate measures to limit pressures and ultimately achieve GES for D7. Environmental targets are often too vague, not clearly linked to pressures and not operational enough to effectively guide towards achieving or maintaining GES. Finally, even when the extent of pressures is adequately addressed, the link with potentially harmed habitats is weakly addressed.

One Member State ([276]) has reported one exception under Art. 14, justified by overriding public interest. Achieving GES would require destruction of major infrastructures that are deemed necessary to public services. In this case ad hoc mitigation measures have been planned.

3.3 Tackling the climate crisis

2023 was the warmest year ever recorded in many parts of the North Hemisphere ([277]). As a result, the Atlantic Ocean has been warmer than average across most of its basins, especially in Europe ([278]). The European Climate Risk Assessment report ([279]) confirms that all European seas are heavily affected by climate risks and anthropogenic pressures.

The **ocean plays a key role in climate regulation**. Scientific evidence shows the ability of the ocean to be our ally in the fight against climate change. In particular, the ocean has taken up more than 90% of the excess heat in the climate system and has absorbed 20-30% of total anthropogenic CO_2 emissions since the 1980s causing further ocean acidification ([280]). This capacity, however, is threatened by increased greenhouse gas emissions. The latest Intergovernmental Panel on Climate Change (IPCC) report on the ocean and cryosphere in a changing climate ([281]) indicates that **the ocean is warming, acidifying and suffering from deoxygenation**. The growing trajectory of this 'deadly trio' changes oceanographic conditions and will reduce the ocean's ability to absorb carbon dioxide and preserve life on the planet.

It is therefore necessary to act and take measures to support this ocean-climate nexus. In particular, the ocean can contribute to **climate change mitigation** by

([274]) https://www.health.belgium.be/en/marine-spatial-plan
([275]) SE, BE, NL, FI and EE
([276]) PL
([277]) State of the Global Climate 2023
([278]) The European heatwave of July 2023 in a longer-term context | Copernicus
([279]) European Climate Risk Assessment — European Environment Agency (europa.eu)
([280]) IPCC Special Report on the Ocean and Cryosphere in a Changing Climate
([281]) AR6 Synthesis Report: Climate Change 2023 — IPCC

- Preserving the capacity of the oceans to act as carbon sinks. This carbon sequestration capacity is ensured by healthy coastal and marine ecosystems.
- Reducing greenhouse gases emissions by developing ocean renewable energies and greening blue economy sectors.

The **European Green Deal** ([282]) boosted actions to make the European Union climate neutral by 2050.

In addition, short-term actions to **adapt to the effects of climate change** and reduce stressors in particular on marine ecosystems are essential. The EU has a **Strategy on Adaptation to Climate Change** ([283]) that sets out how it can adapt to the unavoidable impacts of climate change and become climate resilient by 2050. Biodiversity policies are also known to contribute to climate adaptation. For example, the Biodiversity Strategy to 2030 aims to strengthen climate adaptation objectives (through the protection, restoration and resilience of ecosystems). Horizon Europe, notably through the **EU Missions 'Restore our Ocean and Waters by 2030' and 'Adaptation to Climate Change'**, provides funding for scientific research on the ocean and climate nexus, thus strengthening the European and global scientific capacity to better understand the drivers of change in the oceans and to tackle emerging threats.

The link between ocean and climate is also now an integral part of **international climate agreements**. Since the Paris Agreement ([284]), the ocean has been mentioned several times in climate agreements and recognised as playing a key role in the global climate system. The last development was during COP28, where the role of a healthy ocean was recognised as one of the best defences against climate change.

Addressing climate change through the MSFD

To date, **climate change is not explicitly addressed by the MSFD** as it is not covered by a descriptor nor listed as a pressure. The achievement of GES for many descriptors, however, is influenced by climate change and the Directive mentions that in order to address *"the impact of climate change, it is essential to recognise that the determination of good environmental status may have to be adapted over time*" ([285]). Moreover, the holistic marine strategies provide a good framework to monitor climate change impacts and explore climate change mitigation. This approach was confirmed by the assessment made for the previous cycle, where Member States have highlighted that the impacts caused by climate change and ocean acidification are important transboundary issues that are addressed through MSFD monitoring programmes ([286]).

As climate change is of concern for all marine regions and is a pressure on the marine environment, **a number of Member States now consider climate change as a frontline issue** and **some of them include measures related to the matter**. These measures can be:

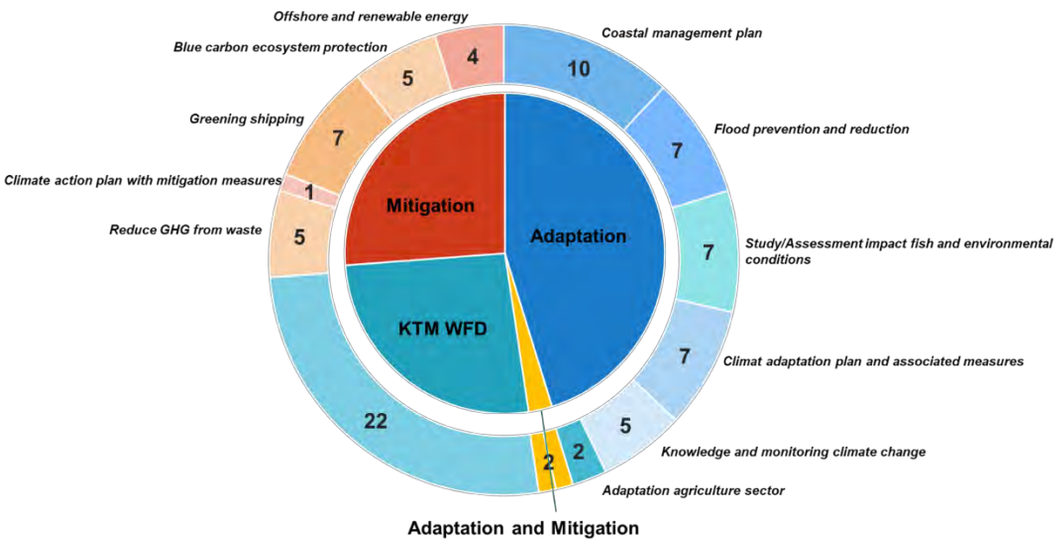
- **Mitigation measures** i.e involving all the processes that human activities can use to reduce and prevent emission of greenhouse gases, such as the development of renewable energy, reducing emissions from maritime transport, protecting and restoring blue carbon ecosystems to sequester carbon, etc.;
- **Measures addressing adaptation and resilience**, the former consisting in all actions undertaken to reduce climate change impacts (e.g. building flood systems, adapting construction to face heatwaves or extreme cold temperatures) and the latter relating to the way communities prepare themselves to address and recover from future deteriorations.

In the second programmes of measures, **15 of the 17 Member States assessed have included measures related to climate change**:

([282]) The European Green Deal - European Commission (europa.eu)
([283]) EUR-Lex - 52021DC0082 - EN - EUR-Lex (europa.eu)
([284]) https://unfccc.int/sites/default/files/english_paris_agreement.pdf (
([285]) See recital 14, Article 3.4 and 3.5of Directive 2008/56/EC
([286]) Report on the implementation of the Marine Strategy Framework Directive (europa.eu)

- 84 measures, accounting for 4% of the total number of measures, are directly related to climate change: the largest number was recorded in Spain, with 25 measures (11% of the total number of measures in that country), followed by Slovenia (13 measures, 14% of the total) followed by Portugal and Ireland (with 7 measures, respectively 13% and 5% of the total);
- Most climate change related measures concern adaptation or resilience (60 including 22 related with the key types of measures (KTM) under the WFD "Climate change adaptation" out of 84), one third is related to mitigation (22 measures) and two are related to both adaptation and mitigation (Figure 12).

Figure 16. Measures related to climate change



Some important measures stem from the Regional Sea Conventions programmes or are linked to them ([287]), others already inserted in their national Climate Action Plans or National Adaptation Strategies ([288]). Some of the Member States also include measures related to strategy for their coasts ([289]). Finally, two of the 17 Member States of which programmes of measures were assessed still do not have clear measures relating to the climate change in their programme of measures ([290]).

Examples of measures related to climate change *mitigation*:

Blue carbon ecosystem protection - Spain is quantifiyng the CO2 capture service by seagrass meadows and macroalgae forests. This work should contribute to identify the most vulnerable grasslands and forests and thus evaluate projects that may threaten these communities or to propose conservation projects, mitigation and restoration of climate change in Spanish waters.

Offshore wind and renewable energy - Portugal is drawing up of the Public Initiative Allocation Plan for Offshore Renewable Energy (PAER). The plan applied the ecosystem-based approach to maritime spatial planning in order to define the areas dedicated to the development of offshore wind farm while protecting marine ecosystems and habitats. France will set up the National Offshore Wind Observatory to disseminate existing studies and data on offshore wind power and to share the knowledge.

Greening shipping - Spain will make an analysis the impacts of liner ferries possibility in view of a possible adjustment of the frequency of inter-island ferries to the real demand. This option would have the purpose of reducing the potential impact on cetacean populations in these areas and reducing greenhouse gas emissions into the atmosphere.

Examples of measures related to *adaptation* and *resilience*:

([287]) IE, SE, EE, CY, SL
([288]) PL, IE, SE, CY, FI, ES, FR
([289]) ES, CY, PT, DE
([290]) NL and LT

Study/assessment impact of climate change – Latvia is carrying out an assessment of the effectiveness of the measures taken to protect seals, taking into account trends in seal populations as well as the impact of climate change on the marine environment.

Flood protection – Finland is implementing nature-based solutions to reduce flood impacts in river basin districts. Slovenia is implementing measures to prevent adverse effects of flood events on important nature protection habitats.

In addition to taking measures to address climate change, Member States were also asked to take into account climate change concerns in the design of their second programmes of measures and in the selection of measures. Out of 17 Member States assessed, only two ([291]) did not include climate change considerations in the design of their programmes. Several Member States ([292]) have adopted **clear methodologies to integrate climate change considerations in the selection and design of measures**, while others take climate change impacts into account but without a clear explanation of how this supports the selection and design of MSFD measures.

In relation to **climate adaptation**, a few Member States ([293]) explicitly describe how their measures contribute to their **national adaptation strategies**. In some cases ([294]), some or all MSFD measures are embedded in national adaptation strategies, in other cases, links to actual strategies are unclear but the contribution of MSFD measures to climate adaptation and to building resilience of marine ecosystems is recognised ([295]). The importance of flexibility and responsiveness of MSFD measures to future climate conditions is also highlighted ([296]).

In relation to **climate mitigation**, only a few Member States ([297]) demonstrate that they have considered the impact of MSFD measures on greenhouse gas (GHG) emissions, for instance by mentioning the **potential of some measures to contribute to carbon storage** ([298]), assessing the measures' impacts on GHG emissions ([299]) or by recognising the importance of marine and coastal habitats as carbon sinks ([300]).

This assessment shows that some Member States have not taken climate change into account when drawing up their programme of measures but have taken adaptation or mitigation measures against climate change.

Good examples

Noteworthy practices include Germany's "climate check" to ensure future measure effectiveness, Estonia inclusion of a study to assess climate change impacts, and Slovenia's emphasis on habitat protection. These examples highlight proactive steps taken by some countries to integrate climate change considerations into their marine strategies comprehensively.

Ireland included the National Climate Action Plan as a measure to make sure that marine considerations were included in its development. In the country, the public consultation process specifically addressed how the impact of climate change could be considered in the programmes of measures.

Cyprus recognition of climate change as a cross-cutting issue and Portugal emphasis on the key role of the MSFD in addressing climate change and pollution underline the multifaceted approach needed to tackle environmental challenges effectively.

([291]) FR and RO
([292]) e.g. EE, DE, SE, SI
([293]) DE, PT, SE.
([294]) DE, PT, SE
([295]) ES
([296]) DE, SE
([297]) DE, FI, SE, SI.
([298]) DE, SE
([299]) FI
([300]) SI

4. Regional coherence

4.1 Regional cooperation & cooperation on transboundary measures

The MSFD requires EU Member States to use existing institutional cooperation structures such as the Regional Sea Conventions (RSCs) to implement the marine strategies in the most coherent way at the regional level. Member States reported that their programme of measures was a result of a cooperation with neighbouring countries through bi- ([301]) or trilateral ([302]) meetings or through joint work in RSCs.

Although relatively few measures have been reported as adopted under the framework of the RSCs (14% of the total measures reported), **regional cooperation, organised within RSCs has played a significant part in this second-cycle reporting exercise**. All 17 Member States referred in their programmes of measures to the relevant RSC that they are signatories to. Coordinated work under these RSCs that are related to the development of national second programme of measures for the MSFD has also been highlighted. This was **demonstrated strongly by Member States that are signatories to HELCOM ([303])**. These Member States explained how their participation in HELCOM meetings and working groups and the Baltic Sea Action Plan (BSAP) ([304]) influenced the development of their second programme of measures. In addition, the Sufficiency of Measures analysis ([305]) helped many Baltic Member States with their gap analysis and selection of additional measures in the second cycle. The use of this tool has led not only to a higher level of regional coherence but also to a higher level of quality of the measures put forward in these countries. Additionally, some Member States ([306]) listed actions under the BSAP that are linked with individual new measures included in their second programme of measures.

Member States that are Contracting Parties to OSPAR ([307]) also highlighted **how regional cooperation influenced the setting of environmental targets/objectives, measures selection** and the overall development of their second programmes of measures. One Member State ([308]) reported that their measures for marine litter are influenced by the implementation of the second **OSPAR Regional Action Plan for Marine Litter**, while another one ([309]) took into account the OSPAR Measures and Actions Programme in the development of their second programme of measures. Four Member States ([310]) also referred to **regional cooperation through UNEP-MAP** ([311]). For example, one Member State ([312]) reported participation in several initiatives under UNEP-MAP to coordinate the implementation of the MSFD in the Mediterranean sea, while another ([313]) stated that their second programmes of measures are aligned with the requirements of UNEP-MAP.

The analysis indicated that **eight Member States** ([314]) **declared cooperation with their neighbouring Member States in the implementation of measures**. Most cooperation seems to be

([301]) RO and BG (reported by RO)
([302]) FR, ES, PT (reported by the three countries); SE, FI, DK (reported by Sweden)
([303]) DE, FI, PL, SE, EE, LV, LT
([304]) Baltic Sea Action Plan – HELCOM
([305]) https://helcom.fi/baltic-sea-action-plan/som/#:~:text=The%20aim%20of%20the%20sufficiency,GES)%20in%20the%20Baltic%20Sea.
([306]) E.g. EE and LT
([307]) BE, DE, ES, FR, IE, NL, PT and SE
([308]) IE
([309]) NL
([310]) ES, FR, CY and SI
([311]) IT also identified UNEP-MAP in their electronic reporting as relevant under "Policies and Conventions", but did not further elaborate on this in their text report.
([312]) ES
([313]) SI
([314]) DE, EE, ES, FI, FR, PT, RO, SE

happening in the Baltic Sea. However, inconsistencies and conflicting information were identified among the country reports. Sometimes the cooperation is only reported from one country but not by the other.

Cooperation between neighbouring countries is essential in jointly addressing many transboundary issues. Member States provided information on bilateral and multilateral cooperation and meetings with other countries to **exchange information and coordinate on measures that require transboundary cooperation**. For example, three Member States sharing waters ([315]) held trilateral meetings to identify common issues related to the management of protected areas, marine litter and underwater noise. Some Member States ([316]) explicitly named the authorities or bodies who participate in regional, bilateral and/or multilateral work in their text reports ([317]). Two Member States ([318]) also explicitly identified the authorities responsible for communicating transboundary impacts of measures to neighbouring Member States. The actual impact of transboundary measures remains, however, hard to estimate.

([315]) FR, ES and PT
([316]) CY, FI, FR, RO, SE
([317]) Maritime Prefects in FR or Ministry of Environment and Water Management in RO
([318]) SE and SI

4.2 Regional coherence of measures

4.2.1 North-East Atlantic

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
Pollution			
Eutrophication (D5)	**Moderate coherence**	• Coherence of gap analyses Only some Member States provide an overview of the current status of the marine environment in relation to D5: BE, DE and SE report that they have not achieved GES for D5 while PT reports that it has achieved GES already. Five Member States (BE, DE, ES, IE and SE) provide a partial analysis of the gaps to achieve GES for D5. None of the Member States provide a detailed analysis of the activities causing nutrient pressures nor how current measures taken under other frameworks address these pressures. Only DE assesses the potential contribution of individual measures within the programmes of measures to the achievement of the GES. It is unclear for most Member States when GES might be achieved with a general lack of information on timelines for achieving GES. • MSFD-specific measures vs other measures Overall, the Member States relied more on measures taken under other legislative/policy frameworks (68%) compared to MSFD-specific measures (32%) although this varied significantly between Member States ([319]). Out of 90 measures reported for D5, 40 were WFD measures and 6 Member States out of 8 refer to the WFD as a driver for their D5 measures. Other frameworks referred to by Member States for D5 include UWWTD and OSPAR. Less than half of the Member States mention MARPOL or existing legislative/policy frameworks relevant to controlling air emissions. Only BE, DE, ES and FR) reported new MSFD-specific measures, including measures to address airborne nutrient inputs, inputs from aquaculture and shipping, handling of fertiliser in ports and restoration of seagrass beds and tidal nature. • Coverage of pressures and activities Only DE and SE adequately covered all relevant pressures with their measures in this second cyle and BE and ES did so partially. 90% of the measures for D5 address the input of nutrient, 55% also address the input of organic matter and only 5% of measures address biological disturbance. Key activities related to D5 pressures identified by Member States include urban wastewater, agriculture, shipping, airborne emissions and urban run-off. DE also identifies aquaculture and handling of fertiliser at ports as activities giving rise to pressures that require management. • Purpose and content of measures Given that legislation and policy is well established in this area, the measures across Member States have a similar focus. There is evidence of further measures being brought	Three Member States out of eight applied for exception, FR, NL and SE. Two Member States, NL and FR, applied exceptions under Art. 14(4), both citing the disproportionate cost of reducing eutrophication. Two Member States, NL ands SE, applied exceptions under Art. 14(1)(e), justifying that the factors contributing to eutrophication are complex, making estimating any date for achieving GES highly speculative. In addition, one Member State, NL, also applies for exception under Art. 14(1)(a), that other Member States' actions also influence eutrophication.

([319]) For example, all of IE and NL's measures were measures taken under other legislative/policy frameworks.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		forward, particularly in relation airborne emissions, ship emissions and nutrient inputs from agriculture and aquaculture. Some measures seeking to reduce the effects of eutrophication are also being implemented, for example, restoring tidal nature (BE) and restoring seagrass meadows (DE).	
Contaminants (D8)	**Moderate coherence**	• Coherence of gap analyses None of the Member States provided a clear and comprehensive gap analysis, all reported partial (BE, DE, IE, SE and NL) to poor (ES, FR and PT) information. The main gaps identified are in relation to Hg, Pb, PCBs and TBT. FR did not provide a quantitative gap analysis, although clear thresholds have been set for D8. BE, IE, NL, and SE provided an overview of the current status of contaminants, with IE reporting that it has achieved GES for D8. In the remaining Member States, although GES is not achieved for D8, some report progress for some substances, e.g. BE reports a positive trend for priority substances (EQS) and illegal discharges (GES ≥ 50%) and NL highlights that pollutant concentrations have been significantly reduced and are still decreasing or stable. NL highlights that for most substances GES is likely to be achieved in the period 2022-2028. However, for persistent substances it is still difficult to demonstrate the impact of the policy. SE notes that despite the reduction of some pollutants above the GES thresholds, the current rate of reduction will not be sufficient to achieve GES in the near future. No Member State analyse how first cycle and updated existing measures will reduce the pressures. No Member State clearly presented conclusions on future socio-economic development to determine future environmental pressures. Only DE indicates that MSFD-specific measures have been subject to an appropriate level of socio-economic impact assessment. • MSFD-specific measures vs other measures All Member States reported measures falling under the WFD, all but PT and SE reported measures taken under OSPAR, all but ES and SE refer to MARPOL, ES, IE, PT, and SE refer to UWWTD and BE, DE, NL, and SE refer to the Bonn Agreement. BE, DE, ES, FR, IE refer to IMO International Convention on Oil Pollution Preparedness, Response and Co-operation while BE, DE, FR, and NL refer to International Convention on the Control of Harmful Anti-fouling Systems on Ships. Only DE and FR referred to the National Emissions Ceiling Directive. No Member States refer to the Zero Pollution targets. All of IE and NL's measures and between 63-75% of measures in BE, DE, FR, PT and SE come from other legislative/policy frameworks. On the other hand, ES reported most measures as MSFD-specific. DE, IE, PT and SE include measures from the 3rd RMPBs under the WFD. In no Member State in the region is the link between the measures and the gap analysis clear. • Coverage of pressures and activities All Member States in the region reported measures concerning input of nutrients and input of organic matter. All Member States except IE reported measures for input of	Four Member States out of eight applied for an exception: FR, NL, PT and SE. Among those Member States, coherence is considered as moderate. FR, NL and SE applied for exceptions under Art. 14(1)(e). The reasons given by these three Member States are linked: persistent contaminants are a long-term issue, and it can take many years for measures to be effective. PT applied for an exception under Art. 14(4) - 'No significant risk or disproportionate cost', however, it did not provide details to understand the spatial extent of contamination is and whether there are ongoing contaminant inputs that might delay recovery. FR additionally applied for exception under Art. 14(1)(a), reasoning that harmonised rules for the use of scrubbers in specific areas is the responsibility of the IMO and the EU and the adoption of Sulphur Emission Control Areas (SECA) is the responsibility of IMO.

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		synthetic and non-synthetic substances. BE, ES, IE, PT, SE also reported measures concerning contamination from ubiquitous, persistent, bioaccumulative and toxic (uPBT) substances and measures concerning acute pollution events. Only DE, ES, and SE reported measures related to the input of water-point sources (e.g. brine), while BE, ES, IE, and SE reported measures concerning adverse effects on species or habitats. It is worth noting that Member States reported a large number of pressures not specifically related to D8 (contamination in seafood (ES, IE, SE), eutrophication (BE, ES, IE, PT, SE) and newly introduced non-indigenous species (BE, ES, SE), as well as various physical and biological pressures. There is moderate coherence in the activities identified by Member States in the region. BE, ES, FR, SE and DE linked their measures to most activities relevant to D8, while PT and IE focused on a smaller number of activities. MSFD-specific measures in BE, DE, SE focus on anti-fouling, while ES, FR, and SE focus on recreational activities. DE and SE tackle underwater munitions, BE shipwrecks, ES and FR cover dredging, SE addresses contaminated sediment and DE takes measures related to mining. Aquaculture is tackled by BE and DE, and DE, FR, and SE focus on shipping. ES and FR refer to scrubbers. NL takes measures referring to PFAS, ES to oiled fauna, BE to fishing lead, DE to sunscreen, and FR has a number of measures focused on education and raising awareness. • Purpose and content of measures The types of measures reported by Member States are moderately coherent, although it is noted that neither IE nor NL reported the purpose of measures in the electronic reporting, and BE and DE did not do so for a significant share of measures. The other Member States took direct measures to prevent further inputs of a pressure (e.g. by managing the source activity), BE, DE, ES and SE took direct measures to reduce existing levels of the pressure (e.g. removal of litter or oil spill clean-up) and all except PT took measures to indirectly prevent further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). DE, ES, FR, SE, PT also took measures to improve the knowledge based and/or establish monitoring programmes. Only SE reported measures to assess the effectiveness of measures and PT reported a measure to directly restore a species or habitat.	
Contaminants in seafood (D9)	**Poor coherence**	• Coherence of gap analyses BE, IE and NL did not carry out a gap analysis because they assess that GES is currently achieved in their waters for D9 and should continue to be without the need for further measures. The other Member States reported either a partial gap analysis (DE, SE) or insufficient information on the main elements of the gap analysis (ES, FR, PT). Half of the Member States provide clear information on the current status of contaminants in seafood (BE, IE, NL, SE). In addition to the three Member States concluding that GES is currently achieved for D9, SE indicates that GES is achieved for contaminants in food in the North Sea. DE reports on GES for	No Member State applied for an exception.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		D8 in the North Sea, but not for D9. For the remaining Member States, the current status is not known (ES, FR, PT). No Member State provides information on the extent to which current measures will reduce pressures. In most Member States it is unclear whether the baseline used to inform the gap analysis takes into account future development activity, considers alternative scenarios or indicates the extent to which socio-economic factors have been taken into account. In addition, no Member State provides information on the effectiveness of the measures. All Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures Looking at all measures reported under D9, 75% of them fall under other legislative/policy frameworks. While FR, IE and SE relied heavily on measures under other legislative/policy frameworks (90% of their measures), BE relied mostly on MSFD-specific measures (85% of their measures). DE, ES, NL and PL defined a balanced mix of already existing and MSFD-specific measures. The most common reference to an existing framework is obviously the Regulation setting maximum levels for certain contaminants in foodstuffs (BE, ES, FR, IE, NL and PT). The WFD is also reported as relevant to D9 by ES, FR, IE, PT and SE, and the UWWTD by PT and SE. ES and PT link to the MSP Directive. Only DE and FR link their measures to OSPAR and SE links D9 measures to many additional frameworks related to pollution (e.g. REACH, Stockholm Convention, etc.) Even if gaps were not clearly identified in any Member State, DE, ES, FR, IE and SE modified MSFD-specific measures from the first cycle or defined additional ones in the second cycle. This includes one measure to improve data collection on contaminants in fishing products and for the proposal of new contaminants (ES) and the other to raise awareness among boaters on the issue of managing discharges from offshore pleasure craft (FR). It is noted that most MS report that they have either achieved GES or are close to doing so – this would explain the lack of additional/modified measures (moderate coherence). • Coverage of pressures and activities All Member States except BE address the D9-specific pressure of *'Contaminants in seafood'*. Other pressures linked to D9 measures directly overlap with D8: *'Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides)'* (DE, ES, FR, NL, PT, SE), *'Input of organic matter'* (ES, FR, IE, PT, SE) and *'Input of nutrients'* (FR, SE). Of all the measures related to the pressure *'Contaminants in seafood'*, 31% are linked to specific activities, in particular *'Waste treatment and disposal'* (FR, SE), *'Agriculture'* (IE, SE), *'Military operations'* (DE, SE), *'Research, survey and educational activities'* (FR, SE) and *'Tourism and leisure activities'* (FR, SE). One Member State partially addresses the relevant pressures (SE) and three Member States insufficiently (DE, ES, FR). For the remaining Member States, no MSFD-specific measures for D9 were adopted in the second cycle, either because they do not correspond to	

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		relevant pressures (PT) or because GES for D9 is considered to be achieved in their waters (BE, IE, NL). • Purpose and content of measures Looking at both first and second cycle measures, only 58% of the measures for D9 are linked to a 'measure purpose' (IE did not report a measure purpose for its D9 measures). Most of the measures reported will have an indirect impact on the pressures, either by indirectly preventing further inputs of a pressure (DE, FR), improving the knowledge base (DE, ES, PT) or establishing monitoring programmes (DE, ES, PT). Few measures aim at directly preventing further inputs of a pressure (SE only) or directly reducing existing levels of the pressure in the marine environment (DE, ES).	
Marine litter (D10)	**Moderate to high coherence**	• Coherence of gap analyses Almost all Member States (except PT) provide a clear overview of the current status of the marine environment in relation to D10, mainly focusing on beach litter as all acknowledge the lack of data for assessing other D10 criteria, but only DE and SE elaborate baseline scenarios against which alternative options are compared. Only half of Member States (SE, NL, BE and FR) provide an estimation of how much the first cycle measures will reduce pressures and the related measures needed in the second cycle. Only ES and BE clearly identify gaps to be addressed (microliter and litter from fishing) and only NL refers to socio-economic developments to determine future environmental pressures. No Member State provided a timeline for achieving GES. • MSFD-specific measures vs other measures IE and SE mostly relied on measures taken under other legislative/policy frameworks for D10, while DE and ES mostly on MSFD-specific measures. The other four (FR, BE, NL and PT) adopted a balanced mix of already established and MSFD-specific measures. EU legislation ([320]) is a clear driver for defining measures. Additional measures from other frameworks mostly focused on tackling single plastic uses and fisheries-induced litter. All but two Member States (BE and FR) explicitly refer to the OSPAR Regional Action Plan on Marine Litter. • Coverage of pressures and activities All Member States in the region except IE have made progress during the second cycle in terms of pressure coverage. 47% of MSFD-specific measures aim at reducing the input of litter while 30% aim at reducing the pressure level in the environment. Of those that aim at reducing the input, however, only 20% are direct measures, managing the source activities and 40% are indirect, aiming at preventing	Two Member States out of eight (BE and SE) applied for exceptions, but under different Articles. BE applied under Art. 14(1)(a), and SE under Art. 14(1)(e). BE's exception however may be a reporting mistake ([321]). SE's justification is that 80 % of litter found on its beaches are from other countries, with estimates that more time is therefore required to meet the threshold (4-5 management cycles).

([320]) Waste Framework Directive (BE, NL, FR, ES, SE and IE), Water Framework Directive (all except PT, SE and NL), Port Reception Facility Directive (all except FR), UWWTD (ES, FR and IE), Single Use Plastic Directive (all except FR and PT), Packaging Waste Directive (only NL and SE), Common Fishery Policy (DE, ES, FR, PT and SE).
([321]) BE applied for an exception, with the reason of action caused by a third party for which the Member State is not responsible. However, the relevant pressure reported is: 'Loss of, or change to, natural biological communities due to cultivation of animal or plant species'', which is not relevant for D10. Moreover, the Exception name and justification reported state: 'no exception', which seems confusing. BE reported no exceptions for D10 in the first cycle.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). Almost 30% of measures are still dedicated to improving the knowledge base and therefore have no immediate effect on reducing marine litter. All Member States in the region report addressing the same group of activities with their D10 measures: fisheries, shipping, tourism and recreational activities, port operations, industry and urban areas. In addition, some Member States identify other sources at sea (e.g. offshore installations in DE), and on land (e.g. packaging in DE and NL, aquaculture in FR and DE) as main contributors to the litter problem and defined new measures to address them. • Purpose and content of measures As far as macrolitter is concerned, all Member States put their main focus on beach litter and less on seabed or water column litter. DE and ES specify that their cleaning actions should address litter in all areas, not only the beach, and NL defines different measures for different categories of litter (e.g. measures specifically dedicated to doly rope, balloons, plastic pellets). In total, 54 measures in five Member States (BE, NL, ES, DE and SE) address microlitter, targeting industry and urban areas as well as tourism/recreational activities and to a small degree fisheries (measures for better management of fishing gears). Some measures are directly aimed at reducing the input of the pressure (e.g. management of fishing gears), while the majority are aimed at reducing the pressure level (e.g. fishing for litter, beach and street clean-up activities).	
Underwater noise (D11)	**Moderate coherence**	• Coherence of gap analyses The information regarding the gap analysis varies a lot across the Member States in the region. BE is the only Member State that provides a complete gap analysis, identifying which additional measures are in place to address gaps. DE, IE and NL do not provide all information, but have, to some extent identified significant gaps to achieve targets and ultimately GES for D11. It is not clear whether ES, FR and SE have adequately addressed all significant gaps to achieve GES. For ES, a gap analysis was carried out focused mainly on progress against environmental targets. There is no information about the current GES status baseline scenario, consideration of how much current measures will reduce pressures, future socio-economic developments, or an indication of the timeline for when GES will be achieved. Similarly, FR carried out a gap analysis but with limited details and SE explained how the gap analysis was performed and how it was the basis for the selection of the new measures for the second cycle. PT does not provide a gap analysis for D11. • MSFD-specific measures vs other measures Some Member States, such as DE, ES and FR, provide many links to various relevant existing policies for D11, while others only refer to a few. IE only refers to OSPAR and IMO and NL only to IMO. Overall, measures are often linked to OSPAR (DE,	No Member State applied for an exception.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		ES, FR and IE), and IMO guidelines for reduction of underwater noise from commercial shipping (FR, NL, IE) and the Habitats and Birds Directive (ES, FR). Overall, the Member States relied both on measures taken under other legislative/policy frameworks and MSFD specific measures. While IE and NL defined only measures taken under other legislative/policy frameworks, the other Member States defined a mix of both types. As a result of the gap analysis, even if clear shortcomings were not identified in most Member States, all Member States except IE and NL modified MSFD-specific measures from the first cycle or defined additional ones in the second cycle to address the gap to achieve GES. • Coverage of pressures and activities All Member States in the region have made some progress during the second cycle in terms of pressure coverage. BE reinforced the first cycle measure to tackle the most prominent source of underwater noise in their water. DE updated its MSFD-specific measure by leveraging HELCOM recommendations to reduce the use of continuous and impulse sound. SE implemented guidelines for minimizing the risk of adverse effects to marine mammals from seismic surveys. PT addresses explicitly continuous noise but not impulsive noise. Its measures are still focused on improving the knowledge base. ES also sets out to increase their knowledge of the current state of underwater noise. Except for one measure generally addressing 'industrial operations', most of FR measures are 'soft measures' aimed at raising awareness and knowledge. In terms of activities, all Member States address some relevant human activities causing both impulsive (defence operations (DE, SE, BE, ES, FR, NL), renewable energy (BE, DE, NL, SE, ES) and continuous noise (shipping (all MS), recreational activities (ES, FR), fishing (ES, FR). FR talks generally about 'industrial operations'. • Purpose and content of measures Considering both first and second cycle reporting, around 35% of the measures are direct measures (aimed at directly reducing further input of the pressure or aimed at directly reduce existing levels of the pressure in the marine environment) and this is from all Member States except FR. The majority of the measures (60%) are indirect, including, around 34% of the measures dedicated to improving the knowledge base (from all Member States except IE and SE) and establishing monitoring programmes (DE, ES and PT). Continuous and impulsive sound are equally addressed by most Member States except PT, which only addresses continuous noise explicitly. DE and BE remain the only Member States to have defined specific measures to address other form of energy, including electromagnetic fields, light and heat (e.g. in DE application of threshold values for the introduction of heat and development and application of environmentally sound lighting of offshore installations; in BE, investigating the impact of electromagnetic fields on gravel beds and associated fauna). NL reported a measure to	

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		address light on oil and gas platforms in 2016, but it seems to have been dropped in the second cycle.	
Biodiversity			
Biodiversity (D1)	**Moderate to high coherence**	• Coherence of gap analyses A gap analysis was undertaken by almost all Member States in the region (BE, DE, ES, FR, IE, NL, SE).Almost all Member States provide a clear overview of the current status (BE, DE, FR (Bay of Biscay & Iberian Coast), IE, NL, SE), focusing on four feature groups (birds, mammals, fish and pelagic habitats) and identifying pressures and activities affecting the marine environment. Only DE elaborates a baseline scenario to use as a benchmark against which alternative options are compared and only FR presents an estimate of how much the first cycle measures will reduce pressures. BE, DE and FR consider future socio-economic development to determine future environmental pressures and present clear conclusions of the effectiveness of the measures. All Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States defined measures linked to the Habitats and Birds Directives. The CFP was also linked to biodiversity measures by all Member States, the MSP Directive by most (BE, DE, ES, IE, PT, SE) and OSPAR in a majority (DE, ES, FR, IE, NL, PT). Four Member States (DE, FR, IE, NL) mentioned the CBD but only two DE and FR have measures linked to the EU Biodiversity Strategy. Overall, most Member States (BE, DE, FR, PT, SE) defined a balanced mix of measures taken under other legislative/policy frameworks and MSFD-specific measures for D1. A few Member States (ES, IE, NL) relied more heavily on the former than the latter when drawing up their PoMs. MSFD-specific measures directly address the pressures in ES, FR and SE, and partially in DE, IE and NL ([322]). • Coverage of pressures and activities All Member states have recognised the need to address pressures on marine species and habitats and have made progress since the previous cycle. There is a general trend towards implementing spatial protection measures and targeting specific pressures like species disturbance (all Member States), fisheries (ES, FR, and DE), and bycatch (all but IE). All but one Member States (IE) defined measures addressing disturbance of species (e.g., where they breed, rest and feed) due to human presence, and all but two (NL, PT) defined measures addressing extraction of, or mortality/injury to, wild species by commercial and recreational fishing and other activities. DE, ES and FR reported measures targeting loss of, or change to, natural biological communities due to cultivation of animal or plant species. The primary activities causing pressures on marine biodiversity, including fish and shellfish harvesting, maritime transport, tourism and recreational pursuits, port operations, industrial processes, urban development and hunting, are broadly and effectively addressed by all Member States.	Two Member States out of eight, FR and SE, applied for the same type of exception (Art.(1)(a) for Descriptor 1 but provide different justifications. Both Member States invoke the need to involve higher-level processes to adopt measures to protect biodiversity against fisheries impacts. FR mentions the processes of mapping Vulnerable Marine Ecosystems under the Deep-Sea Access Regulation and the joint adoption of technical measures applicable to all EU vessels under the Technical Measures Regulation. SE considered that the GES for fish depends heavily on implementation of the EU Common Fisheries Policy (CFP).

([322]) DE and IE do not cover all relevant pressures; PT use mostly indirect measures.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		• Purpose and content of measures Over half of the new MSFD-specific measures aim to directly reduce or prevent inputs of pressures, the rest focusing on monitoring, gaining knowledge, or assessing effectiveness of measures. BE, ES, PT, and SE report considerably more direct measures than other Member States and FR reports more indirect measures. IE reports only a small number of MSFD-specific measures, a few are dedicated to MPA legislation and management, and one is linked to the OSPAR North-East Atlantic Environment Strategy 2030. Around a third of the measures continues to focus on enriching the knowledge base, as reported by all Member States except IE and NL, with a notable number of such measures in FR and ES. Only ES, FR, and SE have dedicated measures to evaluate their effectiveness. In addition to the activities mentioned before, several Member States pinpoint additional sources at sea (e.g., offshore installations in DE) and on land (e.g., packaging in DE and NL; aquaculture in FR and DE) as significant contributors to biodiversity pressures, introducing new measures to tackle these challenges. BE, NL and FR focus on fishing and development plans for specific species. PT defines as main issues human activities such as tourism, recreational activities, and urban development. ES and SE cover different activities through monitoring, research and improving knowledge. IE mainly focuses on MPAs designation and OSPAR activities. All Member States use spatial protection measures, but only BE, ES, PT, SE expand existing MPAs or create new ones.	
NIS (D2)	**Moderate coherence**	• Coherence of gap analyses A gap analysis was undertaken by all Member States in the region. Almost all Member States provide a clear overview of the current status (BE, DE, IE, NL, SE) mainly focusing on newly introduced NIS (D2C1) as information on established NIS and adverse effects is missing (only BE stated that two NIS could lead to changes in the ecosystem). All Member States except PT present pressures and activities causing NIS: shipping, aquaculture (BE, DE, ES, IE, NL, SE), recreational activities (IE and SE), offshore windfarms (BE) and release of species (FR and SE). The other elements of the gap analysis are less coherent. DE, SE and partially IE provide an estimation of how much the first cycle measures will reduce pressures, concluding on the need to define additional measures in the second cycle. While gaps are not clearly defined in most Member States, ES and DE clearly identify priorities for the second programmes of measures, including early warning system for NIS. The elements of the gap analysis that were more difficult to elaborate on are baseline scenarios and consideration of future socio-economic development to determine future environmental pressures (only presented by BE). Most importantly, all Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States except BE and DE refer to the Invasive Alien Species Regulation, FR, NL, PT and SE refer to the IMO Ballast Water Convention and DE, ES, FR and IE refer to	No Member State applied for an exception.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		OSPAR. Other EU legislation are also a clear driver for defining measures: Habitats Directive (ES, FR, BE IE and PT), regulation on the use of alien and locally absent species in aquaculture (DE, IE and SE), WFD (ES, FR and SE) and CFP (ES and FR). Member States relied to a different degree on measures taken under other frameworks. IE and NL only relied on measures taken under other frameworks while ES relied mostly on MSFD-specific measures. FR, BE, DE, PT and SE defined a balanced mix of already established measures and MSFD-specific. 39% of the measures are specific to D2, i.e. they specifically address the implementation of guidelines for biofouling, tackle invasive species (e.g. the proliferation of Rugulopteryx okamurae) or define early warning systems. These measures have addressed to a great extent the relevant pressures. The other measures (61%) are reported as being relevant to more than one descriptor (in particular they also cover D1, D10, D6 and D8). • Coverage of pressures and activities Half of the Member States in the region have made some progress during the second cycle in terms of pressure coverage (SE, BE, NL, DE). DE and SE adequately address all pressures with their new measures in the second cycle, while FR, ES, BE and PT) do this only partially. IE and NL do not report any MSFD-specific new measures for D2. Relevant activities are targeted by most Member States: shipping for both ballast water and hull fouling (BE, DE, ES, IE, NL and SE) and aquaculture (All Member States except NL). In addition, other Member States identify other pathways of NIS introduction: recreational boating (IE and SE), offshore windfarms (BE) and release of species (FR and SE). • Purpose and content of measures There are more MSFD-specific measures aimed at reducing the input of NIS (68% from BE, DE, ES, FR, and SE), than measures aimed at reducing the pressure level in the environment (13% from ES, FR and SE). In addition, of those that aim at reducing the input, 46% of the measures are direct measures, managing the source activities and 54% are indirect measures aiming at preventing further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). A high proportion of measures is still dedicated to improving the knowledge base (19% - defined by ES, FR, PT and SE). BE, DE, ES and SE defined measures aimed at establishing monitoring programmes and only SE defined measures aimed at assessing their effectiveness. FR and SE are the only Member States that established measures aimed at restoring habitats.	
Commercial fish and shellfish (D3)	**Moderate coherence**	• Coherence of gap analyses A gap analysis was undertaken by all Member States in the region. Most provided a clear overview of the current status (BE, DE, IE, NL, SE) mainly focusing on the status of the different commercially fished stocks. Across multiple Member States it is acknowledged that GES for D3 has not been fully achieved (BE, DE, ES, FR, NL, PT). Although some stocks were showing 'good status' or improving trends (BE, IE, NL, SE), most stocks in the NEA region remain 'not good' and 'poor'	Only SE applied for an exception, under Art. 14(1)(a), with the reason that SE is not responsible for all the measures that would need to be taken. Good environmental status for commercially

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		status (BE, DE, IE, NL, PT). All Member States identified the main pressure as extraction of fish and shellfish species, resulting from fishing activities. The other elements of the gap analysis are less coherently presented. Five Member States partially provided an estimate of how much first cycle measures reduced pressures (BE, DE, ES, NL, SE) concluding on the need for additional measures (ES, BE, FR) or strengthening implementation of first cycle measures (DE, NL, SE). The following priorities were identfied for D3 measure updates: recreational fisheries (ES, FR), control of artisanal fishing (ES), locally-managed stocks (FR) and collection of data for dogfish, sharks and rays (BE). The elements of the gap analysis that were less well elaborated were baseline scenarios (only presented by BE and partially by IE) and consideration of future socio-economic development (only presented by BE). Most importantly, all Member States failed to report on a timeline for achieving GES. NL stated that existing policies are adequate to achieve GES in the coming years, however it did not provide a clear timeframe for this. • MSFD-specific measures vs other measures All Member States linked their D3 measures to the CFP. Some Member States reported only the main CFP regulation (Regulation (EU) No 1380/2013) as a measure (e.g. DE, PT, NL), while others reported additional regulations (multi-annual plans, Technical Measures Regulation, EMFAF, DCF) (e.g. BE, SE, FR, IE, ES). ES and PT also specifically referred to regulations from ICCAT. FR, IE and PT mostly relied on measures taken under other frameworks for D3, while ES and SE on MSFD-specific measures. BE and DE defined a mix of already established measures and MSFD-specific. NL only relied on already established measures. • Coverage of pressures and activities Only FR and SE adequately address all pressures with the new measures in the second cycle, while BE, DE and ES did this only partially. NL and PT did not report any new measures specific for D3 and new measures reported by IE are considered to be cross-cutting to all descriptors. Logically, all Member States identify fishing as the main activity causing the pressure for D3 and all have measures that address commercial fishing activity but only some explicitly address recreational fishing (ES, BE, FR, SE). In addition, some Member States identified other relevant activities for the health of fish and shellfish populations, such as tourism (ES and SE), aquaculture (ES, IE, SE), agriculture (ES, SE), extraction of minerals (BE, ES and SE), renewable energy generation (ES, SE) and research (ES, IE) and defined new measures to address them (e.g. to minimise tourism impact, SE report a measure on the protection of the habitat of specific species). • Purpose and content of measures In total 165 measures address the extraction of species by Member States in the region, 37 measures (22.4%) are directly aimed at reducing the input of the pressure (e.g. by implementing the CFP, enforcing technical measures,	exploited fish and shellfish is highly dependent on the implementation of the EU Common Fisheries Policy (CFP) and that regulation taking into account the objectives of the MSFD. This means that SE cannot, on its own, influence whether different fish species meet the set thresholds.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		introducing fisheries resources management plans and enhancing control over commercial fishing activities) and at reducing the pressure level (e.g. promoting the collection of lost fishing gear and ensuring compliance with discard policies). Increasing monitoring efforts is covered by 10 measures from BE, ES and SE; and raising awareness by 50 measures (34%) from BE, DE, ES, FR, PT and SE. Most Member States in the region cover also nationally/locally managed stocks (ES, BE, DE FR, IE and SE). It is unclear whether this is the case for PT and NL. 23 measures explicitly mention 'recreational fisheries' from BE, ES, FR, IE and SE, ranging from regulating recreational fishing, in particular for sea bass (FR), improving fishing gear regulations (SE), implementing monitoring systems (BE). Most Member States do not have specific measures for "age and size distribution" (D3C3). Measures on this include "Promote a sustainable size distribution of coastal fish communities to retain important ecological functions in the food web" but lack practical details on implementation (SE).	
Foodwebs (D4)	**Poor coherence**	• Coherence of gap analyses None of the Member States in the region has carried out an adequate gap analysis for food webs. FR, IE, and SE have done so only partially and BE, NL and PT have not done any. Information for DE and ES is unclear. Assessment of current status is patchy: IE simply reports status as 'unknown', while SE limits discussion to the size structure of different fish communities. DE concludes that food webs are not in good condition but reports that owing to a lack of methods for assessing food webs, it is not possible to provide a large amount of detail. ES does not include discussion of food webs in its gap analyses. Only IE, SE, and DE discuss pressures on food webs, with IE reporting commercial and non-commercial fishing as the main pressure, and the associated damage to benthic habitats. Clear conclusions of the effectiveness of the measures are reported by FR, DE, and SE. Baseline scenarios have been prepared by DE and FR whose analysis also considered future socio-economic development. DE also attempts to provide an indication of a timeline for achieving GES, but it is vague. • MSFD-specific measures vs other measures All Member States linked their D4 measures to other legislative/policy frameworks, in particular the Habitats and Birds Directives (all Member States), the WFD (DE, FR, IE, NL, and SE) and the CFP (DE, ES, FR, IE, and SE). Links to OSPAR are also made by all Member States apart from BE while only DE and FR mentioned the Biodiversity Strategy. Five Member States (BE, DE, ES, PT, and SE) defined MSFD-specific measures for D4. • Coverage of pressures and activities Only ES, FR, and SE have successfully addressed previously identified pressures. IE and PT are considered as partially addressing pressures and information for BE and DE is not clear. NL has not reported new measures for D4 in the second cycle. The main pressures addressed by Member States' measures are species extraction and disturbance, introduction	Only FR has reported exceptions for Descriptor 4 under Art. 14(1)(a), reasoning that fishing of fodder species is covered under the Common Fisheries Policy (CFP). As France is not solely responsible for the CFP, the European Commission must ensure that actions are being taken to meet this objective under the CFP and that fodder species are being protected.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		of invasive species, input of sound and disturbance of seabed habitats. Only BE, DE, and SE address all of these. Extraction of species (i.e. fishing) is addressed by all Member States and disturbance of species by all except NL. NL and PT also address input of sound and PT also physical disturbance of the seabed. The main activities addressed by measures are extraction of species, restructuring of habitats, aquaculture, production of energy, transport, extraction of non-living resources and research. DE, ES, BE, FR, and SE address all these activities. NL does not mention activities at all, and IE and PT only a few. • Purpose and content of measures Birds, mammals, benthic habitats and ecosystems are addressed by all Member States and DE, ES and FR also address fish, cephalopods and hydrological characteristics. D4 food webs specifically links to pelagic habitats, and only NL fails to address this in its measures. BE, DE, ES, and SE report developing new MPAs, covering both D4 and D1, and FR and PT also take MPA-related measures for D4. Several Member States (DE, ES, FR, IE, SE) reported fisheries-related measures including addressing monitoring of fisheries, bycatch, or the reduction of fishing gear loss. Slightly fewer than one third of the measures aim to reduce or prevent inputs of pressures – the rest relate to monitoring, gaining knowledge, or assessing effectiveness of measures. BE and SE report considerably more direct measures, FR more indirect measures, and DE and ES about the same.	
Seabed habitats (D6)	**Moderate coherence**	• Coherence of gap analyses A gap analysis was carried out for D6 by BE, DE, FR, IE, NL and SE, while only partially by ES and PT. Only a few Member States provide a detailed overview of the current status of the seabed (BE, DE and NL). SE, IE and FR only provide partial overviews of the status of seabed integrity. ES and PT do not provide an overall view of the current state of the seabed. DE, BE, FR and NL identify significant gaps in achieving GES for D6, whilst gaps are only partially identified by SE and IE, and not identified at all by ES and PT. Most of the Member States present pressures affecting seabed integrity (FR, NL, SE, BE, DE, ES, and IE), i.e. physical disturbance and physical loss (with biological disturbance and species extraction also reported frequently), however, only DE and IE assign a main contributing human activity to these pressures (bottom-gear fishing and dredging). PT does not identify pressures or activities affecting seabed integrity. DE discusses the extent to which measures could reduce relevant pressures and only provides a vague estimate of the timeline for the expected impact of these measures. FR provides information on the potential for measures to impact pressures, however the pressures reported are more relevant to D1 than D6. BE and SE outline clearly how planned measures will reduce relevant pressures. Only BE and DE consider future socio-economic development to determine future environmental pressures. Only DE provides conclusions on the effectiveness of the measures in achieving GES and identifies significant gaps in achieving GES (partially identified by BE, IE, NL, SE, and not at	FR is the only Member State to apply for an exception under Art. 14(1)(a). FR reasons that action is required from the European Commission for the measures to be implemented, which is out of the control of the Member State. FR argues that the European Commission must undertake the necessary mapping of VMEs under the deep-sea fisheries regulation using Member State data.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		all by ES and PT). All Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States link their D6 measures to the Habitats and Birds Directives, all except BE link to the CFP and all but FR and NL mention the MSP Directive. Only DE, IE and NL link to the EIA Directive. The CBD is mentioned by half of the Member States (DE, FR, IE, NL). All Member States except BE link their PoM to OSPAR. Overall, considering both first and second cycle measures, IE and NL mostly relied on measures taken under other legislative/policy frameworks for D6, while ES, PT and SE on MSFD-specific measures. The others (BE, DE and FR) defined a balanced mix of already established measures and MSFD-specific. As a result of the gap analysis, even if clear shortcomings were not identified in most Member States, all of them modified measures from the first cycle or defined additional ones in the second cycle. New measures cover the training of fishermen to manage negative impacts in PT, national species protection plans in NL, and the coordination of the HELCOM Joint Action plan and OSPAR NE Atlantic Strategy and the regulation of water management under the Water Framework Directive in SE. • Coverage of pressures and activities The technical adequacy assessment concluded that only SE and ES adequately addressed all pressures while BE and DE only partially covered the relevant pressures. NL, FR, PT and IE insufficiently covered the two essential pressures. The main pressures affecting seabed habitats include both physical loss (addressed by 108 measures) and physical disturbance of the seabed (addressed by 132 measures). However, less than half of all measures reported for D6 in the North-East Atlantic are linked to these pressures. Overall, most D6 measures overlap with descriptors D1 and D4, indicating a general approach rather than specificity to the essential pressures affecting seabed integrity. Only 39% of measures for D6 are tied to activities that cause these two essential pressures on seabed integrity (and ES and PT do not report any activity). The most common activity causing physical loss and disturbance of the seabed is bottom trawl fishing, and the other most common activities are seabed mining and dredging. BE, DE, ES, FR and SE have made progress in improving the coverage of D6 pressures in the second cycle. Strong progress is seen particularly in FR while IE and PT seem to have stagnated. • Purpose and content of measures Looking at both first and second cycle reporting, BE, DE, ES, IE, PT and SE report more measures that prevent further inputs of the pressure than measures aimed at directly reducing its existing level in the environment (only ES) or measures directly restoring a species or habitats (only BE, DE, ES and SE). However, of those that aim at reducing the input, only 48% of the measures are direct measures, managing the source activities; 52% are indirect measures aiming at	

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		preventing further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). Additionally, a few measures are dedicated to improving the knowledge base (BE, DE, ES, PT and SE), establishing monitoring programmes (SE only) and assessing measure effectiveness (SE only). Most Member States rely on spatial protection and MPA measures to reduce both physical loss and disturbance of sensitive seabed habitats, with all Member States in the region reporting new spatial protection measures in the second cycle apart from PT and IE. These measures range from designing and implementing new protected areas (SE, DE, FR, BBE), to improving and enlarging the scope of existing protection (NL). PT does not report any new spatial protection measures at all and IE reports measures for the development of a framework which can be used to designate protected areas.	
Hydrographical changes (D7)	**Poor coherence**	• Coherence of gap analyses Almost all Member States reported a gap analysis for D7 (BE, DE, ES, IE, NL, SE). A majority of Member States provide an overview of the current status (BE, DE, IE, NL, SE), all of which note there are no changes since the first cycle (BE) or that GES is achieved (DE, IE, NL, SE). Activities and pressures, such as offshore structures, dredging, and coastal developments, are explicitly mentioned in the assessments of the majority Member States (BE, IE, NL, PT, SE), and all Member States that have performed gap analyses for D7 mention (large scale) human activities as having an effect on hydrography. Most Member States estimate how much *measures taken under other legislative/policy frameworks* will reduce pressures. Some of these measures are seen as sufficient to reach GES (BE, NL, SE), while for other Member States they are not (DE, ES, PT). France, despite not having a gap analysis for D7, included a qualitative appraisal of the contribution of the *measures taken under other legislative/policy* towards GES. None of the Member States report a baseline, nor consider future socio-economic development to determine future environmental pressures, even for EU policy-based activities such as renewable energy and aquaculture, and when reference is made to marine plans under MSP. Clear conclusions on the effectiveness of the measures are given by most of the Member States. Some of them state that there are no changes for this descriptor (BE), or that GES is achieved (DE, IE, NL, SE). The Member States for which GES was not achieved do not give a timeline for when it would be achieved. No common forward vision has been reported for future activities and pressures that could hamper achievement of GES for D7 by causing permanent alteration in hydrological conditions. • MSFD-specific measures vs other measures Some Member States (FR, PT) report multiple links to various existing policies, while some Member States (BE, IE, NL, SE) assign few specific measures to D7. The legislation most cited is the WFD (DE, ES, FR, PT, SE), followed by the Habitat Directive (DE, FR, PT) and UWWTD (FR). The MSP (ES, PT, SE) was cited, without reference to regional cooperation under	No Member State applied for an exception.

Descriptor	Coherence of programmes of measures	Justification	Use of exceptions in the region
		this Directive; Member States also cited the Birds Directive (DE) and the EIA Directive (DE, NL). Only IE and ES cited OSPAR for D7. Considering the measures taken under other legislative/policy frameworks and MSFD-specific measures, half of the Member States defined a balanced mix of both (DE, ES, FR, PT), whereas IE and NL relied more on other frameworks, and BE and SE more on MSFD-specific measures. • Coverage of pressures and activities Almost all Member States report MSFD-specific measures (BE, DE, ES, FR, PT). Almost all Member States report measures that address a D7-related pressure, which is related to reducing the level of impact on hydrographical changes (BE, DE, ES, IE, PT, SE). According to the adequacy assessment, however, none of the Member States comprehensively cover all pressures. BE and NL are the only Member States that show progress since the first programme of measures (BE did not have any measures for D7 in 2016, and NL improved by taking into account future impacts). Activities targeted by the measures include sand management (BE, DE, ES, FR), reducing turbidity (BE, DE), the consideration of freshwater supply needs (FR), and a monitoring study on the conditions of the state of the sea and marine currents (PT). • Purpose and content of measures Considering both first and second cycle reporting, about half of the measures aim at reducing the input of pressures, of which the majority addresses the pressures directly (DE, ES, FR, SE), and only a few measures do so indirectly (BE, DE, ES). A majority of the measures aim at improving the knowledge base, for example by conducting research (DE, FR, ES, PT, SE). There is a clear trend towards improving the knowledge base and management of physical disturbances to the seabed and hydrographical changes. However, the content and focus of the measures vary significantly, ranging from an impact assessment methodology in BE to targeted measures addressing salinity changes in FR and PT, and sediment management in FR, ES, and DE.	

4.2.2 Baltic

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
Pollution			
Eutrophication (D5)	**High to moderate coherence**	• Coherence of gap analyses All Member States have provided an overall coherent analysis of pressures and impacts drawing on information prepared for the Baltic Sea Action Plan (BSAP). HELCOM has facilitated co-operation to undertake detailed modelling of nutrient pressures and estimate the potential nutrient reductions required to achieve GES in different parts of the Baltic Sea. All Member States provide an overview of current status. GES for D5 is not met by any Member State. The main activities giving rise to nutrient pressures are well understood. While the BSAP analysis takes account of measures that have been implemented, it does not take account of updates to RBMPs under WFD. Member States have generally sought to analyse the impact of such measures qualitatively. The baseline scenario contained within the BSAP modelling work (and used by all Member States) reflects the situation as of 2030 taking account of known trends, looking at how nutrient pressures might change over time as a result of development activities. Some Member States have explicitly recognised future pressures in their gap analysis (EE, FI, LT, LV PL) but others have not (DE, SE). Only FI has indicated that it has sought to take account of climate change. All Member States have indicated broad timelines for achieving GES for D5. It is likely to be many decades before GES can be achieved in all Member State waters and only if all relevant parties take the necessary action to further reduce nutrient inputs by significant amounts. • MSFD-specific measures vs other measures All Member States refer to the WFD, HELCOM and the Nitrates Directive (except EE and LV). 25% of the measures reported for D5 in the region are WFD measures. Half of the Member States refer to MARPOL but few Member States refer to legislation and policy relating to airborne emissions (Industrial Emissions Directive (FI, SE), National Emissions Ceiling Directive (DE, FI, SE)). Only FI and SE refer to the UWWTD and only LV mentions the Zero Pollution targets. The Member States rely slightly more on measures taken under other frameworks (60%) compared to MSFD-specific measures (40%) although this varies significantly between Member States. In EE and SE around 90% are measures taken under other frameworks, while in PL around 90% are MSFD-specific measures. All Member States apart from SE report new MSFD-related measures: the 41 new MSFD-specific measures reported address airborne nutrient inputs, inputs from aquaculture and shipping, handling of fertiliser in ports, reducing impact of food production and consumption, sustainable use of wastewater sludge and removal of dead plant biomass as well as a range of actions to better understand nutrient sources and pressures. • Coverage of pressures and activities	Five Member States out of seven applied for exceptions, all under Art. 14(1)(e) (EE, FI, LT, PL and SE). All five Member States provided the same reason for exception: that there is a long time lag for measures to reduce eutrophication to have effect, and GES is only likely to be achieved in the long term. EE additionally mentions the effects of climate change on eutrophication, and SE states that it is not responsible for the measures needing to be taken. LT provides a very limited justification unrelated to D5 which could be a reporting error. Applying for an exception is probably justified also for LT. PL additionally applied for an exception under Art. 14(1)(a), with the reason that eutrophication is an issue requiring action from other Member States.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		The coverage of pressures and activities is assessed as adequate for DE, FI and SE and partially adequate for the other Member States. Of the more than 200 measures relevant to D5, over 90% of the measures address the pressure input of nutrients. Approximately 50% of the measures also address input of organic matter. The sources of nutrient pressures are generally well understood and already addressed through existing legislation. Key activities related to D5 pressures identified by Member States include urban wastewater, agriculture, shipping, airborne emissions and urban run-off. Some Member States also identify aquaculture (DE, FI) and handling of fertiliser at ports (DE, FI, PL) as activities giving rise to pressures that require management. • Purpose and content of measures Around 40% of the measures aim to directly prevent or reduce nutrient pressures and a further 40% to indirectly reduce pressures. Around 10% of measures aim to improve knowledge. Given that legislation and policy are well established in this area, the measures across Member States have a similar focus. There is evidence of additional measures being brought forward, particularly in relation to airborne emissions, ship emissions and nutrient inputs from aquaculture. Some measures seeking to reduce the effects of eutrophication are also being implemented, for example removal of dead plant biomass from the marine environment (FI and LT).	
Contaminants (D8)	**Moderate coherence**	• Coherence of gap analyses Member States' gap analyses have benefitted from regional modelling and work within HELCOM for the Baltic Sea Action Plan. This work assessed a number of substances including mercury, TBT, PFOS and diclofenac in the Baltic Sea. However, only FI provided a complete gap analysis, the remaining Member States have only partially covered the different elements of the gap analysis. All Member States provide an overview of the current status drawing on the BSAP modelling study. The most recurrent substances identified as not meeting GES are Hg, mercury, PBDEs, PFOS and TBT. PL and SE note that, despite the reduction of some pollutants above the GES thresholds, the current rate of reduction will not be sufficient to achieve GES in the near future. EE, FI, LT, LV and PL have provided information on the pressures and their impact on the achievement of GES, with FI even indicated how pressures have changed over time. No Member State provides information on the activities causing the pressures, nor analyse how first cycle and updated existing measures will reduce the pressures. EE, LT and LV elaborate on baseline scenarios reflecting the situation in 2030. No Member States clearly presented conclusions on future socio-economic development to determine future environmental pressures. Similarly, no Member State clearly presented conclusions on the effectiveness of measures. Nevertheless, gaps are identified for all Member States, indicating a range of high concentrations of persistent substances. Only FI reports on a timeline for	Five out of seven Member States applied for exceptions under Art. 14(1)(e): EE, FI, LT, PL, and SE. Although the specific substances mentioned are not always the same, the reason given by all five Member States is that it takes a long time for the concentration of existing substances to reduce. LT applied for an exception under Art. 14(1)(e), however, since it was noted that the issue of contaminants cannot be addressed by LT alone, the basis for the exception should have rather be Art. 14(1)(a). PL additionally applied for an exception under Art. 14(1)(a), with the reason that actions by PL may not be sufficient, and responsibility for the necessary measures

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		achieving GES. FI points out that PBDEs may not be in good condition by 2027, as they are persistent in the environment and there are largely no external sources of loading. • MSFD-specific measures vs other measures All Member States report measures falling under the WFD and HELCOM. Measures relating to MARPOL and the IMO Convention on Oil Pollution Preparedness are reported by DE, EE, FI, LT, PL, and the convention on ships anti-fouling is covered by DE, FI, LT, and LV. On the other hand, UWWTD is only covered by FI, LT, and SE, and REACH and PRF by DE, FI, and SE, which are the only three countries to mention legislative/policy frameworks relevant to combatting air pollution (Industrial Emissions Directive, CLRTAP). Only LV has referred to the Zero Pollution targets. DE, EE, FI, LT, and SE reported most measures as measures under other legislative/policy frameworks (68-85%) while LV and PL both reported most measures as MSFD-specific (75-89%). All Member States have included WFD-related measures (assumed to be part of the 3rd RBMP) related to control of contaminants from land-based sources including wastewater treatment, agriculture, industry and urban run-off. LT and PL both have additional measures concerning pollution from agriculture, DE and EE on ship emissions and LV on waste management (generally and with regard to mercury) and persistent organic pollutants (specifically with regard to PBDE and PFOS). PL refers to priority (hazardous) substances and pollution from urban areas/transport/built infrastructure. SE refers to mercury and the coast guard (which seems to be national legislation with ties to EU fisheries and pollution policies). LT refers to emergency response, in particular oil spills, and sediment. In PL, FI, and EE, PBDE, PFOS, new pharmaceuticals or microplastics are not clearly addressed. In addition in EE emissions from power generation and industrial plants are missing and in PL, coal combustion and heavy industry (heavy metals) are not directly targeted by the measures. • Coverage of pressures and activities All Member States in the region reported measures to address the input of synthetic and non-synthetic substances and radionuclides. The other pressures identified as being specifically relevant to D8 were not reported by all Member States: only EE and SE reported contamination from (non)UPBT substances, and DE and SE were the only to report 'input of water-point sources (e.g. brine)'. DE, EE, and FI report measures concerning acute pollution events. It is worth noting that Member States reported a large number of pressures linked to other descriptors (eutrophication, newly introduced non-indigenous species (EE, SE), as various physical and biological pressures (DE, EE, FI, SE, PL)). Measures concerning litter in the environment were reported by DE, EE, FI, PL, and SE. There is poor coherence in the activities	should be shared by emitting countries.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		identified by Member States in the region. EE reported measures covering all activities, while DE and SE included all activities except the extraction of salt and water. FI and LV did not report any activities, LT only reported ship and air transport, while PL reported agriculture, fish and shellfish harvesting, military operations, research, canalisation and other watercourse modifications survey and educational activities, restructuring of seabed morphology, including dredging & depositing of materials, land transport, urban and industrial uses and waste treatment and disposal. • Purpose and content of measures All Member States but LV reported direct measures to prevent further inputs of a pressure (e.g. by managing the source), all but FI reported direct measures to reduce existing levels of a pressure in the marine environment (e.g. removal of litter or oil spill clean-up), all reported indirect measures to prevent further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns) and all Member States reported measures to improve the knowledge base (e.g. by research or one-off surveys).	
Contaminants in seafood (D9)	**Poor coherence**	• Coherence of gap analyses Only PL provided a clear gap analysis. Of the remaining Member States, most provided partial (DE, FI, SE) or poor information on the key elements of the gap analysis (EE), while LT and LV did not provide any information on the gap analysis for D9. Overall, for most Member States, the technical assessment concludes that the gap analysis prepared for D8 is, to some extent, relevant for D9. Only a few Member States provided clear information on the current status of contaminants in seafood (FI, LV and PL), while SE also provides information, but only partially. FI and LV indicate that the GES level for D9 is currently reached. PL reports that GES is met in its waters, with the exception of PBDE. SE states that for hazardous substances in food, GES is not achieved since the marketing limit values for dioxins and dioxin-like PCBs are often exceeded in wild-caught herring, salmon and trout. For other Member States, no specific information was given (DE, EE and LT). No Member State provides information on the extent to which current measures will reduce pressures or on the effectiveness of the measures. In most Member States it is unclear whether the baseline used to inform the gap analysis takes into account future development activity, considers alternative scenarios or indicates the extent to which socio-economic factors have been taken into account (DE, EE, PL and SE). Only FI and PL report on a timeline for achieving GES before 2030 for FI, not before 2050 for PL because the slow degradation of PBDE). • MSFD-specific measures vs other measures All Member States reported measures falling under HELCOM and EE, FI, PL and SE under the WFD. Other	Two Member States out of seven, PL and SE, applied for exceptions under Art. 14(1)(e). The reasons are different. PL's justification for exception is that no effective measures can be taken to accelerate the achievement of GES for PBDE – there are no significant ongoing inputs, PBDE is widespread in sediments in the marine environment and achievement of GES is therefore dependent on natural degradation which only occurs slowly in the marine environment. SE provides the reason that a reduction of contaminant inputs through SE's measures will not be sufficient to achieve GES and that actions and inactions of neighbouring Member States will impact the achievement of GES. SE's justification seems more appropriate for an exception under Art.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		policies are mentioned by fewer countries, e.g. MARPOL (FI, LT and PL) and the International Convention on Oil Pollution Preparedness, Response and Co-operation (EE and LT). FI and SE link their D9 measures to the UWWTD, the REACH Regulation, the Convention on Long-Range Transboundary Air Pollution (CLTRAP) and the Minamata Convention on Mercury. Other policies include the Port Reception Facilities Directive (SE) and the Stockholm Convention on persistent organic pollutions (POPs) (FI). All Member States, except DE, took more measures under other legislative/policy frameworks for D9 than MSFD-specific measures. Only SE has defined additional measures. • Coverage of pressures and activities Although no measures were reported specifically for D9, five Member States address the D9 specific pressure *Contaminants in seafood* (DE, EE, FI, PL and SE). As all measures overlap with D8, the most frequently reported pressure remains *Input of synthetic substances and non-synthetic substances*. Other reported pressures include *Input of nutrients* and *Input of organic matter* (EE, FI, PL, SE). Waste treatment and disposal and agriculture are the two activities most linked to D9 measures (PL and SE). Other activities include shipping (EE), aquaculture (EE, SE), military operations (DE, SE), industrial uses (PL, SE) and urban uses (PL, SE). Only one Member State adequately addresses the relevant pressures (PL), three Member States partially (EE, FI, SE), and one Member State insufficiently (DE). For LT and LV, no MSFD-specific measures were identified in the second cycle. In PL, the updated measures will not directly contribute significantly to pressure reduction, but when considered together with measures under other legislative/policy frameworks, relevant pressures will continue to be reduced. EE and FI had already adequately addressed pressures in 2016. • Purpose and content of measures All the reported measures for D9 are linked to a 'measure purpose'. Most of the measures aim directly at preventing further inputs of a pressure (EE, FI, PL, SE); fewer aim directly at reducing existing pressure levels in the marine environment (DE only). Other reported purposes are: indirectly preventing further pressures (DE only), establishing monitoring programmes (DE, SE), improving the knowledge base (DE only) or improving the effectiveness of measures (SE only).	14(1)(a) – requiring action from other Member States.
Marine litter (D10)	**Moderate to high coherence**	• Coherence of gap analyses A gap analysis was undertaken by all Member States in the region, although partially in most of them (DE, FI, LT, LV, PL). All Member States provide a clear overview of the current status mainly focusing on beach litter as all acknowledge the lack of data and/or indicators for	No Member States applied for an exception ([323]).

([323]) SE's exception for D10 applies only to its North Sea waters, not to the Baltic, owing to the fact that litter from the North Sea is drifting with streams to the Skagerrak.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		assessing micro-litter and other D10 criteria. SE, LV and PL specifically refer to EU Beach litter thresholds in their report. EE states that the status for macrolitter in the water column and microlitter in surface waters is good but everything else is not achieved/unknown. GES is reported as not achieved by the other Member States. FI highlights the lack of a clear definition of GES, thus the current status could not be assessed. All Member States have provided a coherent analysis of pressures and impacts that need to be addressed to close the gaps to achieve GES, drawing on information prepared for the BSAP. Pressures and activities causing litter are: tourism and leisure activities, followed by fisheries, shipping, and land-based sources. Microlitter and litter in water column and seabed are identified as knowledge gaps to be addressed. An estimate of how much the first cycle measures reduce pressures, as well as clear conclusions on the effectiveness of the measures were given by EE, FI, LT, LV, PL and SE. Baseline scenarios were drawn up by DE, EE, LV, PL, SE, with EE, LV and PL also considering future socio-economic development. SE refers to 2050 for achievement of GES, while EE states that GES will be reached for macrolitter by the end of implementation of the second programme of measures. • MSFD-specific measures vs other measures DE, EE, FI and SE provide many links to relevant existing policies for D10, while LT and LV provide far fewer such links. Six out of seven Member States refer to HELCOM (47 measures, DE EE, FI, LT, PL and SE), but only DE and SE specifically refer to the HELCOM Regional Action Plan on marine Litter. Member States refer to a lesser extent to MARPOL (11 measures, DE, EE, FI, LT and PL). EU legislation is also a clear driver for defining measures: the higher number of measures are linked to the Single Use Plastic Directive (16 measures, DE, FI, LT and SE) and the EU Strategy for Plastics in a Circular Economy (11 measures, DE, FI and LT). Other legislations are mentioned less frequently, including Waste Framework Directive, WFD, PRF Directive and UWWTD. FI and SE rely more on measures taken under other frameworks, while DE and PL more on MSFD-specific measures. EE, LT and LV defined a balanced mix of already established measures and MSFD-specific. • Coverage of pressures and activities All Member States have made some progress during the second cycle in terms of pressure coverage. DE, EE and PL adequately address all pressures with the new measures in the second cycle, while FI, LT, LV and SE do this only partially. There are more MSFD-specific measures aimed at reducing the input of litter (81% from all Member States), than measures aimed at reducing the pressure level in the environment (14% from DE, EE, FI and SE). Of those that aim at reducing the input, the majority (63%) are direct measures (e.g. managing the source activities), while 44% are indirect measures (e.g. by governance mechanisms, financial incentives, awareness campaigns).	

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		A small proportion of measures is still dedicated to improving the knowledge base (7% - defined by all Member States except EE). The most relevant activities causing the pressures are targeted by all Member States: fisheries (mainly by DE, PL, SE, FI and EE), shipping including port operations (mainly by DE, EE, SE, FI, LT and PL), tourism and recreational activities (DE, EE, LT and SE), industry and urban areas (DE, EE, LT, PL, SE). Some Member States identify other sources at sea (e.g. offshore installations DE), and on land (aquaculture SE, DE) as main contributors to the litter problem and defined new measures to address them. FI made progress defining many additional direct measures, covering a gap from the first cycle (mainly indirect measures). SE made progress in addressing tourism/recreation which was not covered in the first cycle. • Purpose and content of measures As far as macrolitter is concerned, all Member States put their main effort and focus on litter on beaches and less on seabed litter and surface litter. Only DE, FI and SE specify that cleaning actions specifically address all elements of litter and not only beach litter. FI defines different measures for different categories of litter (e.g. specifically dedicated to tire, artificial turfs, plastic pellets). Measures addressing microlitter target industry and urban areas, shipping, as well as tourism/recreational activities and to a small extent fisheries (measures for better management of fishing gears). 36% of the MSFD-specific measures tackles microlitter, through different approaches (e.g. reducing microplastic loads from road traffic (FI), treatment of stormwater and wastewater to reduce amounts of microplastics (EE), lobbying for a ban on micro- and nanoplastic particles (PL) or tackling microparticles through management of fishing gears (SE)). More measures aim to reduce the input of the pressure than the pressure level in the environment (e.g. fishing for litter, beach and street clean-up activities).	
Underwater noise (D11)	**High to moderate coherence**	• Coherence of gap analyses The information regarding the gap analysis varies a lot across the Member States in the region. PL is the only Member State that provides a complete gap analysis: it clearly provides an overview of the current status and of progress on the targets and assesses progress made by first cycle measures, concluding that they are not sufficient to achieve GES. It also explains how future developments are taken into account, focusing on increased level of shipping and as offshore wind infrastructure. DE and EE have partially identified significant gaps to achieve targets and ultimately GES for D11. DE clearly addresses the effectiveness of its measures and states that for underwater sound it is not possible to estimate whether current measures are sufficient to achieve good environmental status. It also considers other anthropogenic energy sources such as light in their gap analysis. EE also does not present a complete gap analysis, but acknowledges the benefits of the HELCOM Baltic Sea	No Member State applied for an exception.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		Action Plan which provides data, analysis and recommendations, including for underwater noise and on this basis defined a new measure for D11 in the updated PoMs. SE and FI explained how the gap analysis was performed and how it was the basis for the selection of the new measures for the second cycle but did not specify conclusions on underwater noise. LT and LV do not provide a gap analysis for D11. It must be noted that neither Member State defined GES for D11 under Article 9. Despite this, LT acknowledges in the text report lack of data regarding underwater noise and defines monitoring measures to address the gaps in the updated PoMs; LV, on the other side, does not address underwater noise in its updated PoMs. • MSFD-specific measures vs other measures Some Member States, such as SE, FI and DE provide many links to various relevant existing policies for D11, while others, such as EE, LT and PL mainly refer to HELCOM and national legislations/policies. LV does not define any D11 specific measure and appears to have withdrawn the horizontal measures from the first cycle that were relevant for D11. All Member States, except LV, refer to HELCOM. This shows a high level of coherence. However, other policy/legislation are mentioned by a few Member States only: only DE and SE mention the Habitats and Birds Directive, only DE and FI the EU Biodiversity Strategy, and only FI and PL explicitly link some measures to IMO guidelines on underwater noise from shipping, although also DE has measures to address this pressure from shipping; only FI and SE refer to MSP. Overall, considering both first and second cycle measures, PL defined only MSFD specific measures, while the other Member States defined a mix of both *measures taken under other legislative/policy frameworks* and *MSFD-specific measures*. Three Member States (SE, EE and FI) define measures to implement the HELCOM Regional Action Plan on underwater noise, although SE categorises it as 'existing measure' while EE as 'MSFD specific measure'. The same measure from FI is from the first cycle and it is not clear if it has been updated. As a result of the gap analysis, even if clear shortcomings were not identified in most Member States, all of them, except LV, either modified measures from the first cycle or defined additional ones in the second cycle. • Coverage of pressures and activities All Member States in the region, except for LV, have made some progress during the second cycle with regard to D11 in terms of pressure coverage. The technical adequacy assessment concluded that five MSs (EE, SE, PL, FI and DE) adequately address all pressures with the modified and the additional new measures in the second cycle, while LT does this only partially. LV does not report any measure for D11 in the second cycle and has withdrawn D11 relevant (horizontal) measures from the first cycle. In terms of	

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		activities, DE, EE, FI and SE define measures that target different sources of activity of the pressures (e.g. marine-based renewable energy generation, defence operations, shipping, extraction of minerals). PL defined one measure to address noise from shipping and two measures to address noise from defense operations. LT still focuses its measures of the establishment of monitoring systems. • Purpose and content of measures All Member States defined direct or indirect measures to tackle impulsive sound, while all Member States except LT (and LV) defined direct or indirect measures to tackle continuous sound. Considering both first and second cycle reporting, there are more MSFD-specific measures aimed at reducing the input of sound (69% from all Member States except LV), than measures aimed at reducing the pressure level in the environment (21% from EE, FI and SE). For both types of measures, continuous and impulsive sound are somewhat equally addressed. A few measures are still dedicated to improving the knowledge base (DE, LT and PL) and establishing monitoring programmes (DE only). DE remains the only Member State to have defined specific measures to address other form of energy, including electromagnetic fields, light and heat. Potentially EE, SE and FI will also implement some actions to reduce impact from other noise sources through their general measure implementing the Baltic Regional Action Plan on Underwater Noise (RAP NOISE) recommendations. In particular, EE in the measure description refers to action 29 of the RAP NOISE ('Reduce the impact from acoustic deterrent devices by developing and agreeing on common guidelines and regulation of the design and use of deterrent devices'). SE and FI on the other side do not provide details on 'other form of energy' in the description of the measure implementing RAP NOISE recommendation.	
Biodiversity			
Biodiversity (D1)	**Moderate coherence**	• Coherence of gap analyses Most Member States have adequately identified all gaps, LV and SE ([324]) have partially done so and LT is considered not to have produced an adequate gap analysis. DE, EE, PL and SE presented a clear overview of current status of all four relevant feature groups (birds, fish, mammals and pelagic habitats). Reasons for not reaching GES/targets include high level of pressure caused by fisheries/bycatch (DE, EE, LT, LV, PL), eutrophication (DE, EE, LV) and pollution (LV, PL). Only FI provided an estimation of how much the first cycle and updated existing measures will reduce pressures. Three Member States provide clear conclusions on the effectiveness of the measures (DE, EE, FI) and only DE and PL consider future socio-economic development to determine future environmental pressures. • MSFD-specific measures vs other measures	Five Member States out of seven applied for exceptions (EE, FI, LT, PL and SE). Across those Member States' applications for exception, coherence is poor. For Descriptor 1, all five applied for exceptions under Art.(1)(e) (natural conditions), with FI, PL and SE giving the same reason that GES may not be achieved due to long breeding / life cycle of species which makes

([324]) LV has not addressed all biodiversity aspects of the three relevant (species) groups; SE does not distinguish between the need to expand existing measures and develop new MSFD-specific measures.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		Clear links between biodiversity measures and existing legislation and policies are made, in particular with HELCOM (DE, EE, FI, LT, LV, PL), the Habitats Directive (DE, EE, FI, LT, LV, PL), the Birds Directive (DE, EE, FI, LT, SE) and Biodiversity Strategy (DE, EE, FI). A smaller number of measures are also linked to the CFP (DE, EE, FI, LT, PL, SE), the MSP (DE, FI, SE), the EIA Directive (DE, FI) and Convention on Biological Diversity (DE, FI, PL). Five Member States (DE, EE, LV, FI and SE) rely both on MSFD-specific measures and measures from existing instruments, while LT and PL do not report any MSFD-specific measures. • Coverage of pressures and activities Only EE and SE have fully addressed previously identified pressures, all others address them only partially either by relying prominently on indirect measures or not addressing identified pressures (bird hunting in FI or bird bycatch in LT). The main pressures addressed include extraction and disturbance of species, physical disturbance of seabed, input of nutrients, underwater noise, physical loss of seabed habitats and introduction of invasive species. Primary activities addressed include fisheries, maritime transport, tourism and recreational activities, port operations, and urban development. In addition, certain Member States have identified further pressures, both at sea (e.g., underwater noise and the introduction of non-indigenous species in DE) and on land (e.g., agricultural runoff affecting eutrophication in EE and SE; industrial discharges in PL). Other activities include extraction of production of electricity, aquaculture, extraction of non-living material and research. • Purpose and content of measures Five Member States (DE, EE, FI, PL, SE and LV) address all relevant features (fish, birds, mammals, pelagic habitats, ecosystems). LT predominantly focus on fish species. More than half of the new measures aim at reducing or preventing the inputs of pressures, in particular from fisheries, nutrients and hazardous substances, while the others focus on enhancing monitoring, expanding the knowledge base, including the development of innovative technologies (in EE and LT), or assessing the effectiveness of existing measures. A number of measures also focus designating new MPAs (DE, FI, and SE) and improving their management (EE, PL and LV) and governance, as well as on active restoration of certain habitats (in DE and SE). Only LT does not include MPA-related measures.	species recovery slow, EE invoking climate change and LT the need to maintain the structure of the nutrient network. FI, PL and SE also applied for exceptions for Descriptor 1 under Art.(1)(a) (action for which the Member State is not responsible) for species not residing full time within national boundaries. FI and PL report that the seabirds do not reside all year round within the national boundaries, while SE reports that the GES for fish depends heavily on implementation of the EU Common Fisheries Policy (CFP). PL additionally identifies nutrient concentrations in the water as also dependent on neighbouring states. PL additionally applied for an exception for Descriptor 1 under Art.(1)(b) (natural causes), using the same justification as its application under Art.(1)(a).
NIS (D2)	**Moderate coherence**	• Coherence of gap analyses A gap analysis was undertaken by all Member States in the region. All Member States provide a clear overview of the current status with most Member States stating not to have been able to achieve GES (except FI). FI concludes that GES has been achieved but acknowledges that the situation is not good when looking at the input and spread of already established alien species. The others have not achieved GES mainly because existing measures are	Two Member States out of seven, LT and PL, applied for exceptions. LT applied for an exception under Art.14(1)(e) but did not report a robust and detailed justification based on scientific

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		insufficient. Most Member States (EE, FI, LV, PL) state that shipping activities (ballast water, ship hull fouling) are the main source and pathway of introductions and contributing to the existing pressure. DE, EE and PL provide partial information regarding how much the first cycle and updated existing measures will reduce pressures but most Member States conclude on the need to define additional measures in the second cycle. None of the Member State clearly state by when GES is expected to be achieved. EE, DE, PL and SE identify key gaps highlighting the need for additional measures and implementation of existing legislation /policies. • MSFD-specific measures vs other measures All Member States provide links to relevant existing policies for D2, in particular the Invasive Alien Species Regulation. All Member States except PL and DE refer to the IMO Ballast Water Convention. The CFP is only mentioned by EE. Most Member States (DE, EE, LT, LV, FI) refer to HELCOM. All Member States except PL and LV rely to some degree on measures taken under other framework. DE and EE defined a balanced mix of already established measures and MSFD-specific measures whereas PL rely only on MSFD -specific measures. LT, SE and LV adapt measures taken under other frameworks in the first cycle, e.g. developing guidance for authorities and commercial operations for the disposal of contaminants and fouling in the cleaning of ship hulls and reducing the spread of contaminants from recreational crafts. Almost 70% of the MSFD-specific measures were newly proposed for the second cycle. A number of measures are specific to D2 focusing on shipping and establishing early warning system (LT, DE, LV). • Coverage of pressures and activities All Member States except FI have made progress during the second cycle on D2 in terms of pressure coverage. PL, EE and SE have adequately addressed all pressures with their new measures, while DE and LT do this only partially. FI stated to have achieved GES and relied on measures taken under other frameworks. There are more MSFD-specific measures aimed at reducing the input or spread of NIS (63% of all measures) than measures aimed at reducing existing level of pressure (15% from PL, FI, SE). Of those that aim at reducing the input, only 46% are direct measures, managing the source activities; 51% are indirect aiming at preventing further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). A very small proportion of measures is dedicated to improving the knowledge base (6% - defined by LT, PL and SE). The most relevant activities causing the pressures are addressed by DE, SE and EE: shipping, tourism and recreational activities, aquaculture – freshwater and marine, including infrastructure. Most Member States in the region (FI, LV, LT and PL) do not provide data on relevant activities but some of their measures clearly target main activities, e.g. PL (fisheries),	evidence for the exception. It does however provide the required estimation of when GES is expected to be achieved (2033). PL applied for exceptions under Art. 14(1)(a) and Art. 14(1)(b). For Art. 14(1)(a), PL reports that the transfer and introduction of NIS is an international responsibility and PL cannot bear sole responsibility for introductions to its waters. In addition, the spread of that species, already in the Baltic Sea, to PL waters is out of their control. For Art. 14(1)(b), justification relates to eradication of NIS being difficult and unlikely once the NIS is established.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		LV (ship's ballast water and deposition), LT (investigations to assess the impact of recreational navigation). • Purpose and content of measures The measures addressing newly introduced NIS target shipping and to a small degree tourism, aquaculture and recreational activities. Most of the measures focus on managing sources of activities by directly preventing further inputs of a pressure (e.g. EE - Ensuring environmental safety of shipping, SE- measure addresses reduction of the populations of invasive Gobiidae species in transitional waters through biomanipulation employing predatory fish). FI, PL and SE focus on measures directly restoring a species or habitat(s). Some Member States report measures to establish monitoring programmes (of relevant activities, pressures, or impacts) and measures to indirectly prevent further inputs of a pressure (e.g. by governance mechanisms, financial incentives etc.), e.g. PL - measure on educating aquarists and anglers on the dangers of releasing specimens of invasive alien species into the natural environment.	
Commercial fish and shellfish (D3)	**Moderate to high coherence**	• Coherence of gap analyses A gap analysis was undertaken by all Member States in the region, except for LV. FI, LT, EE and PL based their gap analysis on the HELCOM Sufficiency of Measures (SOM) analysis, providing high level of coherence to the approach across the region. SE and DE carried out a more high-level, qualitative assessment to understand gaps. Almost all Member States provided a clear overview of the current status (DE, EE, FI, LV, PL and SE) mainly focusing on the status of some commercial fishing stocks. Some Member States also provided explanation on why GES has not yet been achieved (DE, FI, PL and SE). All Member States, except LT, explicitly presented pressures and activities for D3. EE, FI and PL clearly estimated how much the first cycle and updated existing measures will reduce pressures and DE and SE did so partially. No information on this was presented by LT and LV. Only FI and PL elaborated baseline scenarios and EE, FI and LV considered future socio-economic development. Regarding barriers to achieving GES, EE and LT stressed the need to address knowledge gaps, DE highlighted the inefficiency of the implementation process of its measures and FI underscored the inefficiency of the measures in covering all key species for D3. EE, FI, LV and PL provided a timeline for achieving GES, while DE, LT and SE did not mention it in their reports. • MSFD-specific measures vs other measures ([325]) Most Member States link their measures to the CFP, some reporting only the main CFP regulation as a measure (e.g. DE), while others report additional regulations such as multi-annual plans, technical measures, EMFAF and the DCF. Only LT did not clearly report any CFP-related	Four Member States out of seven, FI, LT, PL and SE, applied for exceptions. FI, PL and SE applied under Art. 14(1)(a). The reasons given are the same: that fish stocks are dependent on other countries' actions. PL additionally highlights eutrophication as a problem and SE specifically mentions the implementation of the EU Common Fisheries Policy (CFP). FI, PL and LT applied under Art. 14(1)(e), with different justifications, although both LT and PL note the broader marine environment (e.g. deoxygenation) as a factor. FI gave the reason of delayed effect of measures, with the good status of stocks expected to be achieved by 2030.

([325]) LV did not define any measures for D3. It is therefore not included in the next sections of the analysis, but it is considered to draw conclusions on the coherence level.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		legislation for D3. EE relies more on measures taken under other frameworks for D3, while FI, PL and SE rely more on MSFD-specific measures. DE defined a balanced mix of already established measures and MSFD-specific. The only measure proposed by LT is MSFD-specific. Among the new measures, Member States propose to improve the condition of fish spawning areas (EE), cross-border cooperation and action plans to promote more sustainable fish stocks (FI) and promotion of a sustainable size distribution of coastal fish communities (SE). • Coverage of pressures and activities All Member States have measures that address the main pressure for D3, which is extraction of species, and measures that address physical disturbance of the seabed. Although not directly related to achieving GES for D3, fisheries management measures can contribute to GES for D6. Some Member States address additional pressures: bycatch (DE, SE), seaweed harvesting (EE), eutrophication (PL), disturbance of species (FI). EE, FI and SE adequately address all pressures with the new measures in the second cycle, while DE and PL do this only partially. PL's measures predominantly focus on reducing nutrient enrichment, as this has been identified as a pressure that may hinder the recovery of Baltic cod. LT measures will not reduce pressures relevant to D3. LV does not report any measures for D3 and states that GES will be achieved through measures under LV fisheries policy. The primary activity exerting pressure, i.e. commercial fishing, is targeted by all Member States in the region. There is an evident gap in relation to recreational fishing (SE is the only MS that addresses the pressure from recreational fisheries). Some Member States identified other activities impacting the health of fish and shellfish populations: production of energy and aquaculture (SE); construction of canalisation and other water course modifications (EE) and agriculture (PL). • Purpose and content of measures In total 50 measures are reported that address the extraction of species in the region, as direct measures (FI, PL and SE), indirect measures (DE) and a mix of both direct and indirect (EE). More than half of the measures (30) are aimed at directly reducing the input of the pressure (e.g. by establishing fishing restrictions and size limits, implementing new marine protected areas, or promoting the use of selective and low impact fishing gears) and at directly reducing the pressure level (e.g. by developing guidance for the implementation of ecosystem based marine management). Raising awareness measures are adopted by DE, EE, FI, LT and SE, while monitoring efforts measures are adopted by SE only. While all Member States present measures to cover CFP-managed stocks, there is inconsistency in the coverage of stocks and sources, especially concerning locally/nationally managed stocks (addressed by SE, LT and FI only), and from the recreational sector (addressed only by SE).	LT gave the reason that biological changes in the stock have reduced the stocks' reproductive potential. This is due to high natural mortality, close to zero fishing mortality (targeted fishing for eastern cod has been prohibited in the Baltic Sea from 2020 to 2022), and changes in the ecosystem (poor oxygen conditions, reduced availability of prey, high levels of parasites). PL gave the reason that the fishing ban in place for the past few years is not "a sufficiently strong impulse to allow swift regeneration of the population". PL also argued that restoration of GES with regard to cod stocks will likely require an improvement of the environmental conditions, and that climate change may derail the expectation of achieving GES after 2050.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
Food webs (D4)	**Poor coherence**	• Coherence of gap analyses Not all Member States have carried out a gap analysis for food webs in the region. Only PL has adequately identified all gaps, and DE, EE, and SE partially. LT and LV are missing elements in their analysis and FI analysis is only sparsely completed. PL, DE, EE, and SE present an assessment of current status. DE does not provide sufficient details to make a conclusion and SE's assessment is based only on size structure of fish communities. DE, PL, and SE identify pressures affecting food webs, with DE linking these with pressures affecting D1 and D6, and PL listing a broad range, including destruction of habitats, fishing pressure, nutrient input, underwater noise, and pollution, especially from heavy metals. DE, FI, and PL present clear conclusions of the effectiveness of the measures. DE mentions the poor implementation of measures from the first cycle. Only DE and PL present a baseline scenario and consider future socio-economic development, and only DE attempts to provide an indication of a timeline for achieving GES, but this is only vague. • MSFD-specific measures vs other measures All Member States but LV link their D4 measures to other legislative/policy frameworks. HELCOM is cited most often by nearly all the Member States, followed by the Habitats and Birds Directives, the WFD and the CFP. DE, EE, and PL also cite the Biodiversity Strategy as a driver for D4 measures. Considering both MSFD and second cycle measures, DE, EE, FI, and SE present a mix of MSFD-specific and measures based on existing frameworks for D4, although SE relies heavily on MSFD-specific measures. • Coverage of pressures and activities EE and SE successfully address previously identified pressures, FI and PL only partially, LT and LV not at all, and the information for DE is not clear. The main pressures addressed include species extraction and disturbance, introduction of invasive species, microbial pathogens or genetically modified organisms, input of sound and cultivation/artificialisation of natural habitat. Only one pressure, extraction of species (i.e. fishing), is addressed by all Member States (except LV), while disturbance of species is addressed by all except LV and LT. FI and PL also address input of sound, and PL also introduction of invasive species. The main activities addressed include fisheries, restructuring of habitat, extraction of non-living resources, production of energy, aquaculture, transport, urbanisation, tourism, military and research. DE, EE, and SE address all these activities, while LT and LV do not mention activities at all. • Purpose and content of measures The main features covered by D4 measures include birds, mammals, fish, benthic and pelagic habitats, hydrological characteristics and ecosystems. DE, EE, PL and SE address all of these (except hydrological characteristics for PL). FI	LT is the only Member State in the region to apply for an exception for Descriptor 4, under Art. 14(1)(e) (natural conditions). LT's justification is that the nutrient network in the Baltic is a natural condition and cannot be controlled on a Member State level and needs to be maintained by all Baltic countries. LT does not provide an approximate timeline for achieving GES.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		address most habitats and species, while LT only reports on fish. Most Member States (DE, EE, FI, PL, SE) reported fisheries-related measures, such as promoting a sustainable fishing industry, monitoring fishing efforts, or developing alternative fishing gear to prevent bycatch. Slightly fewer than half of the measures for D4 are measures to reduce or prevent inputs of pressures while the rest relate to monitoring, gaining knowledge or assessing effectiveness of measures. EE, PL, and SE report considerably more direct measures and DE, FI, and LT equally direct and indirect. DE, FI, and SE report developing new MPAs linking also to D1, EE and PL focus on improving the management of existing MPAs.	
Seabed habitats (D6)	**Moderate coherence**	• Coherence of gap analyses All Member States in the region carried out a gap analysis for D6, except LT. Only DE reports on almost all elements of the gap analysis. The majority of Member States provide a clear and detailed overview of the current status of the seabed (DE, EE, LV, PL). SE, LT and FI provide a limited overview. LT focuses on human activities undertaken on the seabed and their extent, while FI assessment of the current status is clear but covers only some habitats due to insufficient data for others. DE, EE, FI, LV, and PL adequately identify gaps in achieving GES, only partially by SE, and not at all by LT. All Member States present pressures and activities affecting seabed integrity (DE, EE, FI, LV, PL, SE), with the exception of LT. The most important pressures and activities listed include bottom trawling (DE, EE, PL, SE), excessive nutrient flow (DE, FI, PL), dredging (EE, FI), climate change (DE) and construction of permanent facilities, coastal erosion defences, and shipping (EE). Only DE and FI discuss the extent to which the measures could reduce the pressures. DE provides only a vague estimate of the timeline for the expected impact of these measures. In four Member States, the gap analysis elaborates on baseline scenarios that serve as a benchmark against which alternative options are compared (DE, EE, LV and PL). Only DE and EE consider future socio-economic development to determine future environmental pressures. Only DE provides conclusions on the effectiveness of the measures in achieving GES, describing the ability of each measure to reduce anthropogenic pressures. Only FI reports on a timeline for achieving GES, which has been set to 2027. FI however stresses the challenge to provide a timeline for when GES will be reached, pointing out that restoring habitats can take decades. • MSFD-specific measures vs other measures All Member States link their D6 measures to HELCOM and the Habitats Directive, five mention the Birds Directive (DE, EE, FI, LT and SE) and four the MSP Directive (DE, FI, PL, SE). Only DE, FI and LT mention the EIA Directive and DE, FI and PL the CBD. The CFP is mentioned by all Member States, except LV. DE is the only country reporting links to OSPAR. However, as shown below, Member States do not	PL is the only Member State to apply for exceptions. PL applied for exceptions under Art. 14(1)(a), Art. 14(1)(e), and Art. 14(1)(d). The reason given under Art. 14(1)(a) and Art. 14(1)(e) is that reducing nutrient concentration in Polish waters requires significant action on the part of other neighbouring states. The reason given under Art. 14(1)(d) is that PL does not believe that reversing all physical loss in PL waters is in the public interest. Ensuring no loss will require the removal of several structures which would have a negative economic impact and may cause a loss of jobs.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		always clearly link the actual measures to these other legislative/policy frameworks. Overall, considering both the first and second cycle measures, Member States mostly relied on MSFD-specific measures for D6. Only LT relied heavily on measures taken under other legislative/policy frameworks. As a result of the gap analysis, even if clear shortcomings were not identified in most Member States, all of them, (except LT which did not carry out a gap analysis), modified measures taken under other legislative/policy frameworks identified in the first cycle or defined additional ones in the second cycle. • Coverage of pressures and activities The coherence of approaches taken across the region to address pressures is low. Only 39% of all measures reported for D6 in the Baltic Sea are linked to the pressures of physical loss and physical disturbance of the seabed. Other recurrent reported pressures include biological disturbance to species (EE, FI, LT, LV and SE) and extraction of species (DE, EE, FI, LT, LV, PL and SE). As a result, most D6 measures overlap with descriptors D1 and D4, indicating a general approach rather than an approach specific to the pressures affecting seabed integrity. Only half of the measures addressing physical loss and disturbance of the seabed (DE, EE, FI and SE) are tied to activities (and FI does not report any activity). The most common activity is fishing, as in the first cycle, with the measures of DE, EE and SE mainly targeting commercial and recreational fish and shellfish harvesting. The other most common activities reported for causing physical loss and disturbance are extraction of minerals (DE and EE), restructuring of seabed morphology including dredging and depositing of materials (DE, EE and SE) and offshore structures other than for oil/gas/renewables (DE and EE). • Purpose and content of measures Looking at both first and second cycle reporting, ES, EE, FI and SE report more measures that prevent further inputs of the pressures than measures aimed at directly reducing its existing level in the environment (only FI and SE) or measures directly restoring a species or habitats (only DE, EE and SE). Of those that aim at reducing input, only 27% of the measures are direct measures, managing the source activities; 44% are indirect measures aiming at preventing further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). A few measures are dedicated to improving the knowledge base (DE, FI and SE), establishing monitoring programmes (DE, EE and SE) and assessing measure effectiveness (EE, FI and SE). Aside from LT, all Member States in the region reported new spatial protection measures also for D6.	
Hydrographical changes (D7)	**Moderate coherence**	• Coherence of gap analyses All Member States reported a gap analysis (DE, EE, FI, LT, LV, PL, SE). A majority of the Member States provided an overview of the current status (DE, EE, FI, LV, PL, SE) and some of them mention GES is achieved (DE, FI, SE). Human	Only PL applied for an exception under Art. 14(1)(d), with the reason that achieving GES for D7 in three transitional water

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		activities and pressures such as dams and windfarms are explicitly mentioned in the assessments of almost all Member States (DE, EE, FI, LT, PL, SE), and all Member States that have performed a gap analysis for D7 mention these large scale human activities as having an effect on hydrography. Climate change as a pressure is mentioned by a few Member States (FI, PL). A few Member States estimate how much measures taken under other legislative/policy frameworks will reduce pressures (DE, EE, FI, SE). None of the Member States reported a baseline. Some Member States consider future socio-economic development to determine future environmental pressures (FI, LT, PL). Clear conclusions on the effectiveness of the measures are given by most of the Member States (DE, EE, FI SE). It should be noted that several Member States are not adopting new MSFD-specific measures (FI, LT, LV), in case of FI and SE because the Member States do not see the need. The Member States for which GES was not achieved do not give a timeline for when it would be achieved. Coherence is moderate in both the methodological approach and the conclusions on assessment of status and gap analysis. Despite the work done within HELCOM, no common forward vision has been reported for future activities and pressures that could hamper achievement of GES for D7 by causing permanent alteration in hydrological conditions. • MSFD-specific measures vs other measures The most cited legislation is the WFD (DE, FI, PL, SE). followed by HELCOM, the Habitats Directive (DE, EE, FI), and the Birds Directive (DE). The MSP was referred to only a few times (DE, FI, SE) as was the EIA Directive (DE). DE is the only Member State that links multiple existing policies to more than one measure. Considering the measures taken under other legislative/policy frameworks and MSFD-specific measures, almost all Member States defined a balanced mix of both (DE, FI, PL, SE), whereas EE relied purely on MSFD-specific measures. • Coverage of pressures and activities Compared to the 2016 assessment, no progress in terms of pressure coverage has taken place with regard to D7. Three Member States report additional or modified MSFD specific measures (DE, PL and EE). They primarily address changes to hydrological conditions (DE, EE), and disturbance of the seabed (DE, PL). These three Member States cover various activities with their D7 measures: DE focuses on sediment management, EE's measures relate to infrastructure and renewable energy, and PL measures focuses on the protection of the seafloor. Several Member States do not report new D7 measures in the second cycle (FI, LT, LV, SE). • Purpose and content of measures Considering both first and second cycle reporting, most of the MSFD-specific measures aim at reducing the input of	bodies would require destruction of major infrastructures that are deemed necessary for public services and economic activities and in some cases threaten wild species that live in these areas.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		pressures, of which the majority addresses the pressures directly (DE, EE, FI, PL, SE), and some measures do so indirectly (DE, FI, PL). Some Member States (DE, EE, FI) provide measures to assess the impact/effectiveness of measures or restoring of an ecosystem. Only a few measures aim at improving the knowledge base, for example by conducting research (DE, SE). Overall, the measures across Member States do not cover similar content or purposes in the Baltic region. While some Member States focus on sediment management (DE) or on improving environmental governance and data management (EE), others (PL) have a mix of indirect measures focusing on governance and knowledge improvement. Some Member States have been assessed as not reporting D7 relevant measures because GES is achieved (FI, SE) or because of a lack of information (LT, LV).	

4.2.3 Mediterranean

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
Pollution			
Eutrophication (D5)	**Moderate coherence**	• Coherence of gap analyses CY, ES and SI have provided a partial gap analysis. CY, ES and SI report to be achieving GES for D5. Insufficient information has been provided by FR and IT to inform such an assessment. While all five Member States ([326]) provide some reference to pressures and activities, none of the Member States provide a detailed analysis of the activities causing nutrient pressures nor how current measures under other frameworks address these pressures apart from some limited analysis by SI. It is thus unclear to what extent the measures will support achievement of GES for D5. None of the Member States provided a baseline scenario or alternative scenarios to inform the gap analysis. Nor do Member States indicate whether the gap analysis has taken account of future development activity or socio-economic factors. No timelines for achieving GES are provided by IT and FR (the others having already achieved GES for D5). • MSFD-specific measures vs other measures All Member States refer to the WFD, UWWTD and Nitrates Directive, apart from FR which has not identified any specific measures for D5 in the Mediterranean. Of the total of 55 measures, 11 are specifically identified as WFD measures. ES and IT refer to MARPOL. CY and SI refer to the Industrial Emissions Directive. Only ES refers to UNEP-MAP. No Member States refer to the Zero Pollution targets. The Member States rely more on measures taken under other frameworks (65%) compared to MSFD-specific measures (35%) although this varies between Member States. In CY and SI all the identified measures are taken under other frameworks. For ES, 14 of the 15 measures are MSFD-specific measures. Only ES and IT report new MSFD-related measures, including measures to address water pollution in port areas through improvements to port waste reception facilities and measures to address inputs from shipping. • Coverage of pressures and activities The coverage of pressures and activities is considered partially adequate for ES, not clear for IT and not relevant to CY and SI as they have not identified any new measures for D5 (as D5 is considered as being achieved). Similarly, FR has not identified any specific new measures for D5, although it is unclear whether FR is achieving GES for D5. Nutrient pressures are overall well understood and addressed by existing laws and policies that seek to manage the input of nutrients into marine waters. Key activities related to D5 pressures identified by the Member States include urban wastewater, agriculture and urban run-off. Some Member States also identify aquaculture	No Member State applied for an exception.

([326]) HR, EL and MT had not reported their programmes of measures by the cut-off date and are therefore not included in the assessment

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		(CY, IT) and ports/shipping (CY, ES, IT) as activities giving rise to pressures that require management. ES references pressures from shipping. • Purpose and content of measures Of the 55 measures, around 85% of the measures aim to directly prevent or reduce nutrient pressures and a further 10% aim to indirectly reduce pressures. This is reasonably consistent across Member States. Given that legislation and policy is well established in this area, the measures across Member States tend to have a similar focus. There is evidence of some further measures being brought forward by ES and IT, including in relation to ship emissions, nutrient inputs from agriculture and aquaculture and from recreational vessels. No measures have been identified that are seeking to reduce the effects of eutrophication within the marine environment.	
Contaminants (D8)	**Moderate coherence**	• Coherence of gap analyses None of the Member States in the region provided a clear gap analysis so it cannot be considered that a coherent approach has been used. CY and SI provided partial gap analyses, while in ES it was not clear. No gap analysis was presented by FR or IT. No Member States clearly presented conclusions on future socio-economic development to determine future environmental pressures or a timeline for achieving GES, an analysis of how first cycle and updated existing measures will reduce pressures, or clear conclusions on the effectiveness of measures. Only SI and ES presented information on pressures/impacts and their influence of GES achievement, and FR makes some reference to pressures/activities. GES is considered achieved in some Member States (CY), and it is unclear in others (FR). Gaps identified related to coverage of PCB (ES) and TBT in seawater and mercury/benzo(a)pyrene in sediment (SI). There does not seem to be any coherence with regard to the gaps or barriers to achieving GES. • MSFD-specific measures vs other measures Member States in the region have made clear links with existing legislation and policies. All Member States refer to UNEP-MAP, while all except SI refer to the WFD. CY, ES, FR and IT refer to the Nitrates Directive and IMO, specifically MARPOL (CY, FR, IT), and the London Convention (CY and FR). Other policies include the UWWTD (CY, ES, SI), while CY and SI refer to the IED. FR and IT refer to REACH, while ES and FR also refer to the Habitats Directive. No references are made to Zero Pollution targets, Barcelona Convention or National Ceilings Emissions Directive which are all potentially relevant updated existing measures for D8. Overall, considering both first and second cycle measures, the Member States relied to a similar degree on measures taken under other legislative/policy frameworks. CY and IT have reported only measures taken under other legislation/policy frameworks, and at 75% for FR and SI. ES is the outlier with most measures reported as being MSFD-specific (59%). Only CY and SI have taken new	Two Member States out of five, FR and SI, applied for exception, both under Art. 14(1)(a), but for different reasons. In addition, both applied for an exception under Art. 14(1)(e). FR's justification was that action is needed either by the EU (e.g. CFP) or by another international Competent Authority (e.g. IMO). SI applied two exceptions with separate justifications for TBT and mercury. However, for TBT, recent monitoring data indicates that GES is now being achieved (and likely to continue to be achieved) and it is therefore questionable why an exception is still needed.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		measures under other legislative/policy frameworks, e.g. on radioactivity pollution, sulfur emissions, agriculture and pollution from maritime transport. • Coverage of pressures and activities All Member States reported measures to address the pressure of input of synthetic and non-synthetic substances and radionuclides. This pressure was reported for 100 out of 122 relevant measures. CY, ES, and IT also reported measures to address the input of water–point sources (e.g. brine). One ES measure also addresses (non)UPBT substances and acute pollution events specifically. The pressures reported can therefore be considered coherent across Member States in the region. Almost all relevant activities are considered addressed by FR and ES and 4 out of the 5 countries also reported aquaculture and shipping. • Purpose and content of measures The new/modified measures in ES, FR, CY and SI cover some of the same pressures, in particular those caused by maritime transport and ports/marinas. However, the measures reported cover a wide variety of topics, including measures to improve knowledge and monitor. The measures also focus on the source activities, with only SI referring to reducing specific contaminants. It is noted that the majority of contaminants covered under D8 do not seem to be covered under the reported measures. In terms of the purpose of measures, there is moderate coherence. All Member States report measures to directly reduce existing levels of the pressures in the marine environment (e.g. removal of litter or oil spill clean-up). Most Member States (except IT) report measures to directly prevent further inputs of a pressure (e.g. by managing the source activity) or to directly prevent further inputs of a pressure (e.g. by governance mechanisms, financial incentives etc.). Measures to improve knowledge were only reported by ES and FR, while CY, ES and FR reported measures to establish monitoring programmes. Only CY reported D8 measures to directly restore a species or habitat.	
Contaminants in seafood (D9)	**Poor coherence**	• Coherence of gap analyses None of the Member States provided a clear gap analysis, most reported partial (CY) to poor (ES, FR and SI) information on the essential elements of the gap analysis. Additionally, IT failed to submit any information on the gap analysis for D9. It is worth noting that neither FR nor SI provided a quantitative gap analysis, although clear thresholds have been set for D9. As for ES, it is unclear whether all significant gaps to the achievement of GES for D9 have been identified, as the gap analysis provided is general and not broken down by descriptor. None of the Member States provide clear information on the current status of contaminants in seafood. However, CY refers to WFD and MED POL monitoring data, which suggest that GES is currently achieved for D9. SI states that the available monitoring data indicate that the standards laid down in	No Member State applied for an exception.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		Regulation 1881/2006 are met. No Member State referred to pressures/activities in relation to the gap analysis. No Member State provides information on the extent to which current measures will reduce pressures. In all Member States it is unclear whether the baseline used to inform the gap analysis considers future development activity, considers alternative scenarios or indicates the extent to which socio-economic factors have been taken into account. No Member State provides information on the effectiveness of the measures. All Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States, except ES, reported more measures under other legislative/policy frameworks than MSFD-specific measures for D9. IT and FR linked all their D9 measures to other frameworks. On the other hand, ES reported only MSFD-specific measures. Surprisingly, only CY explicitly refers to Regulation 1881/2006 setting maximum levels for certain contaminants in foodstuffs. Looking at the other policies linked to D9 measures, the most common are the WFD (ES, FR and IT) and the REACH Directive (FR and IT). Other frameworks are reported but only by one or two Member States every time (nitrates, MSP, UWWTD, UNEP-MAP and IMO instruments). Only ES defined an additional measure for D9 in the second cycle, although they did not carry out a gap analysis specifically for D9, focusing on studies to improve data collection on contaminants in fishery products and to propose new contaminants. • Coverage of pressures and activities Although specific to D9, the pressure *'Contaminants in seafood'* is only reported by CY and ES, and for only 10% of all measures reported under D9. However, the two Member States do not associate their measures with a specific activity causing the pressure. The most frequently reported pressure is *'Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides)'*, accounting for 84% of all reported pressures under D9 (ES, FR, IT and SI). Other pressures reported include: *'Input of nutrients'* (ES, FR, IT, SI), *'Contaminants - non UPBT substances'* (ES, FR), *'Input of litter'* (ES, FR, IT) and *'Input of organic matter'* (ES, FR, IT). Few of the measures (32%) are linked to the specific activities causing the pressures. *'Waste treatment and disposal'* (FR) and *'Urban uses'* (FR, SI) are the two most reported activities. Other activities include *'Transport – shipping'* (FR, SI), *'Agriculture'* (SI), *'Industrial uses'* (SI) and *'Research, survey and educational activities'* (FR). Only ES and FR have identified MSFD-specific measures to address relevant pressures. However, the technical adequacy assessment concluded that it is not clear whether these measures address all relevant D9 pressures. This is due to the lack of detailed information from the gap analysis on significant pressures (ES) and the lack of quantification of the contribution of the measures to pressure reduction (ES, FR). It is also noted for both Member	

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		States that the vast majority of the measures identified are cross-cutting in nature, which is likely to have a limited impact on progress towards/maintenance of GES for D9. • Purpose and content of measures Considering all reported measures for D9 (first and second cycle), all measures reported under D9 are linked to a 'measure purpose'. Most of the measures aim at indirectly preventing further pressure inputs (CY, ES, FR, SI) and/or directly reducing existing pressure levels in the marine environment (ES, FR, IT). Fewer measures directly prevent further pressures (only SI), improve the knowledge base (ES, FR) and establish monitoring programmes (ES, FR).	
Marine litter (D10)	**Moderate to high coherence**	• Coherence of gap analyses All Member States in the region, except IT, provided a gap analysis which was considered partially adequate. Only SI present a clear overview of the current status as part of the gap analysis (GES is not achieved). ES, SI and CY provide some details regarding relevant pressures and activities causing marine litter and identify the priorities to be addressed by the update (e.g. reduction of litter inputs from various sources (aquaculture, fisheries, tourism, leisure and submerged vessels) (SI), focus on fishing-related waste and river-based input into the sea (both from agricultural as well as other sectors) (ES), seabed and floating microplastics (CY)). None of the Member States provide an estimation of how much the measures from the first cycle will reduce pressures nor conclusions on the effectiveness of the second cycle measures to close the gaps. Similarly, none of the Member States elaborate on baseline scenarios or considers future socio-economic developments. Finally, none of the Member States indicate a timeline for achieving GES. • MSFD-specific measures vs other measures ES, FR and CY provide many links to relevant existing policies, while IT and SI make fewer of such links. All Member States refer to UNEP-MAP in general (20 measures), while MARPOL is mentioned only by ES, FR and IT (9 measures). EU legislation is also a driver for defining measures, in particular the Waste Framework Directive (48 measures, all except SI). Other EU legislation is mentioned less frequently: WFD, SUP Directive, CFP, UWWTD or PRF Directive. All Member States except ES defined a balanced mix of measures taken under other frameworks and MSFD-specific. ES relied mostly on MSFD-specific measures. As a result of the gap analysis, all Member States, except CY, modified MSFD-specific measures from the first cycle or defined additional ones in the second cycle. The vast majority of these measures (86%) are specific to D10, i.e. they uniquely target marine litter. • Coverage of pressures and activities All Member States in the region, except CY, have made some progress during the second cycle in terms of pressure coverage. All Member States partially address the relevant pressures with new measures in the second cycle.	Only SI applied for an exception under Art. 14(1)(a), Art. 14(1)(b) and Art. 14(1)(e). SI's reason is that marine litter is a transboundary problem (Art. 14(1)(a)), litter is brought to SI via marine currents and various rivers (Art. 14(1)(b)), and the shallowness and enclosed nature of the Adriatic Sea mean concentrations of litter tend to accumulate in the northern part of the Adriatic Sea (Art. 14(1)(e)).

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		The most relevant activities causing the pressure of litter inputs are targeted by all. The main focus is on specific litter sources in the marine environment (e.g., fisheries, shipping, leisure & tourism). In addition ES, SI and IT also include specific measures tackling land-based sources (waste waters), and IT and SI also tackle aquaculture specifically. Overall, there is more focus on macro-litter but some Member States (e.g. ES, IT) included specific direct measures for microlitter too. For some countries, the reported measures lack detailed descriptions making it difficult to assess their effectiveness fully (IT, FR). Around 25% of measures (from ES FR and SI, the vast majority from ES) aim to directly prevent further inputs of a pressures (by reducing the source activity), 43% of measures (from ES, IT and SI) aim to directly reduce existing levels of the pressure in the environment (e.g., through removal of litter) and 26% of measures aim to indirectly prevent further input of a pressure. • Purpose and content of measures As far as macrolitter is concerned, IT, SI and FR put effort and focus on seabed and surface litter in addition to beaches. SI does this through measures that tackle fisheries, shipping and tourisms activities. Other Member States have more specific measures, e.g. expert group to identify the most appropriate measures to combat the impacts of litter on the seabed (IT) or a dedicated measure on macrolitter on beaches, seabed and sea surface for the highly touristic Western Med region (FR). All Member States, except CY, address microlitter, but to different degrees. SI does so only indirectly with the inclusion of a measure on 'fishing for litter', as well as a measure to support municipalities in the implementation of the SUP Directive. FR and IT address microlitter together with macrolitter with a measure on waste- and storm-waters. ES takes several soft but specific measures to close knowledge gaps and raise awareness. Litter in biota is marginally addressed. SI has identified accumulation of micro-waste in fish as a significant pressure but does not take a measure. IT, ES and CY mention loggerhead turtle (*Caretta caretta*) in one of their targets but fail to include dedicated measures in their programmes of measures (except for knowledge improvement measures).	
Underwater noise (D11)	**Moderate coherence**	• Coherence of gap analyses The information regarding the gap analysis varies across the Member States in the region. For ES, a gap analysis was carried out and described, but it focused mainly on progress against environmental targets. There is no information about the current GES status baseline scenario, consideration of how much current measures will reduce pressures, future socio-economic developments, or an indication of the timeline for when GES will be achieved. Similarly, FR carried out a gap analysis, but does not present enough details. SI and CY both stated that they did not carry out a gap analysis due to lack of data for impulsive noise or continuous noise. SI acknowledges that thresholds were not yet defined in 2022 when the PoMs	No Member State applied for an exception.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		was being updated. CY participated and benefited from the QuietMED2 and QuietSEAS European project, which are considered as contributing to the gap analysis. No conclusions or summary of findings from the project are presented though, and no rational, plan or measures are built upon those projects. However, CY does at identify the main activities causing the pressures in its waters: fishing and pleasure vessel for low continuous noise, and hydrocarbon exploration for impulsive noise. No information regarding the gap analysis was provided by IT. • MSFD-specific measures vs other measures Measures for D11 are often linked to the Habitats Directive (ES, FR and IT) and the EIA Directive (CY, ES, IT). CY, ES and FR refer to UNEP/MAP policies. In particular, ES has a dedicated measure to implement Recommendations, decisions and documents approved by the Barcelona Convention (2016-2021) although it is a cross-cutting measure, and CY has a dedicated measure to implement the Offshore Protocol. ACCOBAMS is mentioned by ES and SI only, while IMO Guidelines on the assessment of impacts and the limitation of submarine noise are mentioned by IT and SI only. Overall, considering both first and second cycle measures, the Member States relied more heavily on measures taken under other legislative/policy frameworks than MSFD specific measures. ES, FR and SI defined both MSFD specific measures and measures taken under other legislative/policy frameworks, while CY and IT only relied on the latter. As a result of the gap analysis, even if clear shortcomings were not identified in most Member States, three MS (ES, FR and SI) have modified some measures from the first cycle or defined several additional ones in the second cycle, e.g. mitigation measures derived from IMO and ACCOBAMS to reduce continuous and impulsive underwater noise (SI) or measuree implementing LIFE projects (FR aimed at restoring and maintaining the good conservation status of natural marine habitats, ES consisting of pilot activities to mitigate underwater noise in areas of the Natura 2000 Network). • Coverage of pressures and activities The Member States in the region did not make much progress on D11 during the second cycle in terms of pressure coverage. The technical adequacy assessment concluded that ES and FR have partially adequately addressed all pressures. One measure from ES aims to minimise the emission of underwater noise in general and specifically from commercial and industrial activities. FR aims to collect and disseminate impulsive noise data from industrial operations. SI has two MSFD-specific measures, one addressing continuous sound for individual vessels and specific activities such as dredging and drilling and another one addressing impulsive sound. In terms of activities, all Member States address some relevant human activities causing both impulsive (dredging and pile	

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		drilling, defence operations (SI), renewable energy (ES)) and continuous noise (recreational activities (ES, FR and SI), fishing (ES, FR, SI), shipping (ES, FR), port activities (ES, SI)). FR talks generally about 'industrial operations'. In the second cycle, IT did not report in detail, so it is impossible to understand what activities are addressed by its two D11 measures (one implementing EIA, VAS and environmental impact assessment and the other one 'Guidelines relating to the assessment of impacts and the limitation of submarine noise'). • Purpose and content of measures Considering both first and second cycle reporting, most of the measures from all Member States in the region aim to reduce the input of sound. There are no measures aiming to reduce the pressure level in the environment. Around 32% of the measures are direct measures. Another 35% (mainly from FR) are indirect measures and there are several measures (mainly from ES and FR) still dedicated to improving the knowledge base and establishing monitoring programmes. Continuous and impulsive sound are equally addressed by ES, FR and SI. CY does not explicitly address activities causing continuous noise, while it is not clear what type of noise is addressed by the measures defined by IT. None of the Member States in the region address other anthropogenic input source such as heat/light.	
Biodiversity			
Biodiversity (D1)	**Moderate coherence**	• Coherence of gap analyses A gap analysis was undertaken by four out of five Member States in the region. Only FR is considered to adequately identify all significant gaps. SI and CY partially identify significant gaps, and ES very partially. Only CY and SI reported on the current status with detailed updates on the status of birds, marine mammals, reptiles, fish, cephalopods, and pelagic habitats. The FR gap analysis focuses on design of new measures and not current status. The ES analysis is restricted to progress on environmental targets. The need for additional data collection is identified by CY, FR and SI, in particular in relation to demographic and distribution data which is essential for mapping and tracking species populations. Only FR considers future socio-economic development to determine future environmental. None of the Member States prepared a baseline scenario, nor indicated a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States have measures linked to the Habitats and Birds Directives, the CFP and UNEP/MAP. Links to MSP Directive (ES), EIA Directive (CY, IT), Biodiversity Strategy (FR, IT) and CBD (FR, IT) are less common. FR adopted a balanced mix of existing and MSFD-specific measures. IT and SI adpoted a larger number of extising measures, while the opposite is true for ES; CY did not adopt any MSFD-specific measures. With their MSFD-	Two Member States out of five, IT and FR, applied for exceptions for Descriptor 1, under Art. 14(1)(a) with different justifications. IT mentions "Benthic-feeding birds" but provides no other justification for the exception. FR's justification is that the control to implement the measures lies with EU processes rather than France, notably under the Deep-Sea Access Regulation and the Technical Measures Regulation.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		specific measures, ES and FR cover relevant pressures through direct measures while SI cover pressures indirectly. • Coverage of pressures and activities CY, ES, FR, SI have all made some progress since the first cycle, but only FR has improved in terms of addressing pressures with targeted measures for habitats and species. FR, ES, SI and CY all aim to address disturbance of species, and extraction or mortality/harmfulness of wild species, but only FR and ES do it adequately, using direct and indirect measures. SI and IT measures are all indirect. There is a lack of uniformity in addressing the same kind of pressure among the Member States: incidental bycatch is a common concern, yet approaches vary significantly. ES and FR aim to tackle a broader range of pressures, but with different focuses (species vs. habitats). CY, FR, SI also report on the activities causing pressures, in particular fish and shellfish harvesting (professional, recreational) and shipping. • Purpose and content of measures While there is coherence in terms of the types of features that are addressed, the specific features on which Member States focus vary. Generally, benthic broad habitats are the features most often targeted by D1 measures in the Mediterranean (ES, FR, IT, SI) although protection of seabed habitats falls more naturally under D6. Measures include protection of Posidonia beds (SI) or mapping of biogenic seabed (IT). Small-toothed cetaceans (all Member States) and baleen whales (CY, ES, FR, IT) are also commonly targeted features, for example through the education of fishermen on reducing bycatch (IT), the improvement of response to strandings (ES), and reducing the risk of collisions with vessels (FR). Improvement or expansion of MPAs are reported by all Member States. ES, IT and SI report developing new MPAs, ES and FR focus on strengthening the management of existing MPAs. In some cases, particular features are targeted (e.g. biogenic reefs in SI) while in other cases protection is more general, based on the precautionary principle where data on biodiversity is limited. With the exception of CY, the Mediterranean Member States have made progress with regards to the protection target, with all reporting an aim to increase the percentage of their national waters which are protected.	
NIS (D2)	**Moderate coherence**	• Coherence of gap analyses Only ES and SI undertook a clear gap analysis. Except IT, all other Member States provide a clear overview of the current status. GES has not been achieved in these Member States acknowledging lack of data for assessing NIS introductions. Only three Member States specifically present pressures and activities causing new introductions: CY (aquaculture, ballast waters and hull fouling), FR (import of fauna and flora, ballast waters and introduction and transfer of aquaculture species); SI (hull fouling and ballast water discharges). While the gaps are not clearly defined in most Member States, FR identifies priorities for	Only CY applied for an exception in this region for D2 under Art. 14(1)(a), giving the reason that the Suez Canal is the most significant source of introduction and increase in NIS, and there are inherent difficulties in dealing with and preventing the introduction of NIS

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		the measures update for D2 and SI states that GES for D2 should be achieved through cross-border (sub)regional responses. The elements of the gap analysis that were more difficult to elaborate on are baseline scenarios (only SI), and consideration of future socio-economic development to determine future environmental pressures. Most importantly, all Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States link their measures for D2 to relevant existing policies. All Member States refer to the Invasive Alien Species Regulation. FR, IT, CY, and ES refer to the CFP, FR and SI refer to UNEP-MAP, only FR and CY mention the IMO Ballast Water Convention. SI has referred to national and other policies. All Member States in the region are coherent in linking their measures to specific legislation/policies. CY considered measures only taken under other legislative/policy frameworks for D2, whereas ES mostly relied on MSFD-specific measures. FR, IT and SI adopted both measures under other legislative/policy frameworks and MSFD-specified measures. FR, IT and ES identified additional MSFD-specific measures as a result of gap analysis. Few measures are specific however. • Coverage of pressures and activities ES, FR, IT have made some progress during the second cycle regarding D2 in terms of pressure coverage, but they have only partially addressed the relevant pressures. SI does not report any modified or additional MSFD specific measures specific for D2 and rather rely on measures taken under other frameworks. The most relevant activities causing the pressures for D2 are targeted by most Member States (FR, CY, SI, ES) in the region: aquaculture, tourism and shipping. CY have also identified some measures which cover research, survey and educational activities. • Purpose and content of measures Most of the measures focus on managing sources of activities by directly preventing further inputs of a pressure (e.g. CY - Control and / or limitation of the use NIS in aquaculture through the implementation of regulation, SI - regulating the introduction of NIS into the aquatic environment); a small portion of measures from ES and IT are aimed at directly reducing existing levels of the pressure in the marine environment (e.g. control and management of biofouling of vessels to minimize the transfer of aquatic invasive species respectively). Most Member States (IT, ES, FR, SI) report measures to establish monitoring programmes (of relevant activities, pressures, or impacts) and measures to indirectly prevent further inputs of a pressure (e.g. by governance mechanisms, financial incentives etc.)	through it. Taking preventive measures is not possible since the management of the Suez Canal is not under the control of the EU or any Member State and therefore no measures can be taken/implemented at this level.
Commercial fish and shellfish (D3)	**Moderate to high coherence**	• Coherence of gap analyses A gap analysis was undertaken by all Member States in the region, except for IT. Only SI provided an overview of	No Member State applied for an exception.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		current status for D3, highlighting the overfishing conditions of its stocks and declining trends in cephalopods' landings. FR, CY and ES provides a partial overview of current status. Only FR and SI state clearly that professional or recreational fishing activities are contributing to the pressure. No information regarding how much the first cycle measures reduce pressures is presented by any of the Member States. CY, ES, and SI still conclude on the need to define additional measures (e.g. monitoring programmes for pelagic species (CY) and measures for recreational fisheries (ES)). FR highlights the need for additional measures for locally-managed stocks and recreational fisheries. The elements of the gap analysis that were more difficult to elaborate are baseline scenarios, and consideration of future socio-economic development to determine future environmental pressures (only presented by FR). Most importantly, all Member States failed to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All Member States provide links to relevant existing policies for D3 in particular the CFP. ES and CY also refer explicitly to EMFAF and CY, ES and IT to the DCF. All Member States except ES refer to the GFCM. Other EU legislation and policies are also drivers for defining measures, e.g. Birds and Habitat Directives (ES, FR and IT) and WFD (ES and FR), Biodiversity Strategy (IT) and MSP Directive (ES). ES, FR and IT also refer to UNEP-MAP. CY and SI rely only, and IT predominantly, on measures taken under other frameworks and ES mostly relied on MSFD-specific measures. FR defined a balanced mix of already established and MSFD-specific measures. As a result of the gap analysis, all Member States except CY have modified or added MSFD-related measures. ES and FR have included measures regarding the strengthening of control and surveillance of fisheries (e.g. fight against IUU fishing and installation of onboard remote electronic monitoring systems – ES or developing skills of different users such as community agents or coast guard – FR) and the same plus IT have added or modified a regulatory framework for recreational fishing (e.g. moratorium on recreational fishing of species of high conservation value such as grouper and corvina). • Coverage of pressures and activities All Member States have measures that address the main pressure for D3, which is extraction of species. Only FR adequately address all relevant pressures with the new measures in the second cycle, ES, IT, SI and CY only partially address relevant pressures, while SI and CY did not report any new measures specific to D3. The most relevant activity causing the pressures, fishing (both commercial and recreational), is targeted by all Member States in the region. In addition, some Member States identified other sources of pressure that might impact D3 such as activities related to research (CY and ES), dredging (FR and ES), and aquaculture (ES, FR and SI) as	

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		contributors to the status of fish and shellfish and defined new measures to address them. • Purpose and content of measures In total 97 measures address the extraction of species (fishing) by all Member States. The vast majority (80% of all measures) aim to directly reduce the pressure level in the environment (e.g. implementation of fishing management plans, enforcement of discard policy, measures to protect specific species) or the input of the pressure (e.g. limiting the use of trawl nets, adaptation of practices of professional fishermen); 7% of measures aim to indirectly prevent further input of the pressure (e.g. governance mechanisms, financial incentives or awareness campaigns). Another 13% of measures aim to improve knowledge and establishing monitoring programmes (from ES, FR and IT) and three measures by CY, ES and FR also aim to directly restore species or habitats (e.g. fish population restoration by implanting artificial reefs (FR)). A few measures (explicitly) mention recreational fisheries in ES, FR and IT. The adequacy assessment particularly underscores the efforts of ES, IT and FR in implementing measures that effectively cover local and national stocks not regulated under the CFP.	
Food webs (D4)	**Poor coherence**	• Coherence of gap analyses None of the Member States in the region have carried out an adequate gap analysis, FR and SI have done so only partially, CY and IT do not report a gap analysis for D4, and information is unclear for ES. None of the Member States describe current status in a great extent. SI limits discussion to the state of primary seabed producers under D5 (human-induced eutrophication) and FR focuses on status of species linked to D1. Fra and SI discuss pressureson food webs, though SI limits this to eutrophication and FR assumes that the same pressures as D1 apply on food webs. Only FR reports clear conclusions of the effectiveness of previous measures, presents a baseline scenario and considers future socio-economic development, but together with D1, not separated for D4. No timelines for achieving GES are discussed. • MSFD-specific measures vs other measures All Member States link their D4 measures to other frameworks. SI only reports three measures for D4, all national, so is not covered by the following analysis. Member States make links to the Habitats and the Birds Directives, the CFP and the WFD (only FR), as well as UNEP-MAP. CY, FR, and IT mention the Biodiversity Strategy. Only ES defined MSFD-specific measures for D4. • Coverage of pressures and activities Only ES and FR have adequately addressed previously identified pressures, while SI does this only partially and the information is not clear for IT due to a lack of detail in the gap analysis and the measures themselves. CY only reports first cycle measures. The main pressures addressed	Only FR has reported exceptions for Descriptor 4 under Art. 14(1)(a), reasoning that fishing of fodder species is covered under the common fisheries policy (CFP). As FR is not solely responsible for the CFP, the European Commission must ensure that actions are being taken to meet this objective under the CFP and that fodder species are being protected.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		by measures are species extraction and disturbance, introduction of invasive species, input of sound and disturbance of seabed habitats. Only CY, ES, and FR address all of these, but extraction and disturbance of species are addressed by all Member States (apart from SI). The main activities addressed by measures include, extraction of species (fishing), tourism, research, restructuring of habitats, aquaculture, transport, urban uses, military activities, and extraction of non-living resources. ES, FR, and SI address all these activities, while CY only mentions three: fish harvesting, fish processing and research, and IT only tourism. • Purpose and content of measures The main features covered include birds, mammals, fish and benthic habitats, with mammals and fish covered by all Member States and pelagic habitats by all except IT. Cephalopods, reptiles and ecosystems overall are also addressed, but to a lesser extent. Fisheries-related measures reported by almost all Member States (ES, FR, IT, SI) included monitoring of fisheries, development of training measures for fishing operators, and prevention of negative impacts of marine aquaculture. ES addresses D4 through the expansion of existing MPAs, designation of new sites and review of management plans. FR, IT and SI partially address D4 pressures through spatial protection, but details are lacking. No new spatial measures are reported for CY. Slightly less than half of the measures aim to reduce or prevent inputs of pressures, the rest relate to monitoring, gaining knowledge or assessing effectiveness of measures. CY and IT report considerably more direct measures, FR more indirect measures and ES and SI an equal share of direct and indirect measures.	
Seabed habitats (D6)	**Moderate coherence**	• Coherence of gap analyses A clear gap analysis was carried out by FR and SI. The gap analysis provided by ES was not clear, and only consisted of a table of targets and associated measures. CY provided only a partial gap analysis and IT did not provide any. SI is the only Member State to provide a clear overview of the current state of the seabed. FR falls short of providing a comprehensive overview on the current environmental status of seabed habitats. ES, CY, and IT do not provide any overview of the current state of the seabed. None of the five Member States explicitly identify relevant pressures and activities. Only SI assessment of the current state implicitly identifies pressures and activities causing damage by detailing the state of seabed habitats and the extent of their degradation or loss. While the gaps are not clearly defined for CY, ES and IT, SI and FR identify clear gaps in the progress towards GES, however FR gaps are tailored more to D1. Clear conclusions are not provided for FR, IT or ES regarding the effectiveness of measures. ES explains this lack of effectiveness analysis is due to a lack of information, lack of monitoring programmes and poorly defined targets. The gap analysis for FR focuses more on presenting new measures to fill gaps and does not discuss effectiveness,	FR is the only Member State to apply for an exception under Art. 14(1)(a). FR reasons that action is required from the European Commission for the measures to be implemented, which is out of the control of the Member State. FR argues that the European Commission must undertake the necessary mapping of VMEs under the deep-sea fisheries regulation using Member State data.

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		and IT does not report any gap analysis information. None of the Member States elaborated on baseline scenarios as a benchmark against which alternative options are compared, nor did they consider future socio-economic development to determine future environmental pressures. All Member States fail to report on a timeline for achieving GES. • MSFD-specific measures vs other measures All five Member States link their D6 measures to the Habitats and Birds Directives, the WFD and the CFP. Only ES reports the MSP Directive as relevant and only two Member States mention the CBD (FR, IT). All Member States establish links between their D6 measures and the Barcelona Convention. Overall, considering both first and second cycle measures, Member States mostly relied for D6 on measures taken under other legislative/policy framework. Only ES relied heavily on MSFD-specific measures. CY did not report any MSFD-specific measures under D6. As a result of the gap analysis, even if clear shortcomings were not identified in most Member States, all of them, except CY, modified measures from the first cycle or defined additional ones in the second cycle. The proportion of these measures which are specific to D6 is low at only 23%. These specific measures target seabed integrity through reducing relevant pressures such as extraction, physical loss, and physical disturbance. The remaining measures are reported as relevant to more than one descriptor and are therefore more general actions (often also cover D1 and D4). • Coverage of pressures and activities The main pressures affecting seabed habitats include both physical loss and physical disturbance of the seabed. Considering both first and second cycle measures, only ES and SI identified additional measures addressing both pressures. Overall, most D6 measures overlap with descriptors D1 and D4, indicating a general approach rather than specificity to the essential pressures on seabed integrity (physical loss and disturbance). Other recurrent pressures include biological disturbance to species and extraction of species (CY, ES, FR, IT and SI), biological cultivation of habitats (ES, FR, IT, and SI) and input of litter (CY, ES, FR, IT and SI). Only half of the measures addressing physical loss and disturbance of the seabed reported by ES and SI are tied to activities. The most common activity causing physical loss and disturbance of the seabed is identified as fishing, as in the first cycle. Others include transport infrastructure, tourism and recreation, and agriculture. The technical adequacy assessment concluded that ES and SI adequately address all the relevant pressures with the MSFD-specific measures reported in the second cycle. FR and IT only partially covers the relevant pressures. All Member States in the region, with the exception of CY, have made	

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		progress in improving the coverage of D6 pressures in the second cycle. • Purpose and content of measures Looking at both first and second cycle reporting, ES and SI (the only Member States to address the two relevant pressures) report more measures that prevent further inputs of the pressure (86 %), than measures aimed at directly reducing its existing level in the environment (13 % from only ES) or measures directly restoring a species or habitats (19% from only ES). Only 32% of the measures are direct measures, managing the source activities; 53% are indirect measures aiming at preventing further inputs of a pressure (e.g. by governance mechanisms, financial incentives, awareness campaigns). Additionally, a high proportion of measures is dedicated to improving the knowledge base (32% from ES and SI), and a few measures are aimed at establishing monitoring programmes (9% from ES) and even fewer aimed at assessing their effectiveness (2% from ES). Most Member States rely on spatial protection and MPA measures to reduce both physical loss and disturbance of sensitive seabed habitats. Aside from CY which did not report any new measures, all four remaining Member States reported new spatial protection measures. A large proportion of the spatial protection measures reported under D6 are also reported under D1. In some cases (notably in SI), habitat-specific protected areas are proposed, for example to protect Zostera beds, detritus beds, rock reefs or biogenic reefs.	
Hydrographical changes (D7)	**Poor coherence**	• Coherence of gap analyses Almost all Member States (CY, ES, FR, SI) reported a gap analysis, but only CY and ES do so with D7 specific findings. SI merely reports information about expected improvements related to permanent alteration of hydrographical conditions. CY, ES and SI mention that there is a need for better data, knowledge, and understanding of the effects of human activities and hydrographical changes on marine ecosystems. An overview of the current status is not given by any of the Member States, nor it is estimated how much *measures taken under other legislative/policy frameworks* will reduce pressures. A baseline or consideration of future socio-economic development to determine future environmental pressures was not given either, and clear conclusions on the effectiveness of measures were missing as well as a timeline for when GES would be achieved. Coherence is poor in both the methodological approach and the conclusions on assessment of status (missing for all Member States) and gap analysis. No common forward vision has been reported for future activities and pressures that could hamper achievement of GES for D7 by causing permanent alteration in hydrological conditions. • MSFD-specific measures vs other measures	No Member State applied for an exception

Descriptor	Coherence of Programmes of measures	Justification	Use of exceptions in the region
		Most Member States report a single policy linked to the measures relevant to D7: EIA Directive (CY, IT) Habitats Directive (FR, SI) and WFD (ES, FR). The MSP (ES), Birds Directive (SI) and UWWTD (FR) were least mentioned. Few Member States (FR, SI) mention measures linked to UNEP/MAP. Considering the measures taken under other legislative/policy frameworks and MSFD-specific measures, SI defines a balanced mix of both, whereas CY relied more on the first type, and ES relied more on the second type. The Member States in the region fail to mobilise the MSP Directive that could provide forward-looking vision of activities, pressures and impacts. Almost all Member States report MSFD-specific measures (ES, FR IT, SI), but only a small portion of the measures are linked specifically to D7 (ES, FR). The other measures are reported as being relevant to more than one descriptor (and also cover in particular D1 and D6). • Coverage of pressures and activities According to the adequacy assessment, none of the Member States have made progress on the coverage of relevant pressures. Only ES and FR report measures on a D7-related pressure, which are related to reducing the level of impact on hydrographical changes. In the second cycle the Member States do not cover activities in a coherent way. Both ES and FR have measures related to sediment management, while the other Member States's measures cover activities that are less relevant for D7. SI D7 measures mostly cover aquaculture, and protection of the seabed. In IT, the D7 measures are related to the input of sound and energy. • Purpose and content of measures Considering both first and second cycle reporting, more than half of the MSFD-specific measures aim at reducing the input of pressures, of which about half addresses the pressures directly (ES, FR, SI), and half do so indirectly (ES, FR, SI). Only one MS (ES) provides a few measures to assess the impact/effectiveness of measures or restoring of an ecosystem. Half of the measures aim at improving the knowledge base, for example by conducting research (ES, FR, IT, SI). Regarding the content of measures, there is great variety between the second cycle MSFD-specific measures reported by the Member States (ES, FR, IT, SI; CY did not report). While ES and FR measures focus on sediment management, ES reports measures to improve the knowledge base on coastal and marine ecosystems, while FR measures are linked to salinity changes. The measures of other Member States are not related to D7 content-wise (IT, SI).	

5. Governance

Out of the 17 Programmes of measures assessed, six Member States ([327]) provided highly adequate information with regard to cross-cutting and governance issues, eight Member States ([328]) provided information of average quality and three Member States ([329]) scored low.

The following sections look in more details at: public consultations; cooperation with other authorities/policy areas; integration of EU policy objectives; integration of socio-economic considerations into the design of the programmes of measures; and funding.

5.1 Public consultations

The majority of Member States reported conducting a public consultation and provided the dates the consultation ran for (see table 1). Only two Member States ([330]) did not report holding a public consultation, two ([331]) reported conducting a public consultation but not receiving any views and another two ([332]) provided very limited information which does not allow for the assessment of the scope of their consultation and

The remaining eleven Member States ([333]) provided **detailed information on the public consultation they conducted**, including the dates of the consultation (often lasting between one and three months) and the type of engagement with stakeholders (although they did not all provide information on the stakeholders who were invited or who participated). Some Member States ([334]) explicitly stated they made the entire programmes of measures available for comment to the public.

Five Member States ([335]) offered **various means of giving feedback** besides or ahead of the online consultation: they organised workshops, seminars and bilateral meetings with targeted stakeholders to gather a broad range of comments. Only one Member State ([336]) indicated consulting neighbouring countries as part of its consultation process.

Two Member States ([337]) conducted an **active promotion campaign** to advertise the public consultation, one ([338]) by inviting participants on social media while the other ([339]) launched it in a national newspaper and followed up with an intensive promotion campaign. That Member State reported a high level of engagement as a result with the submission of 188 contributions.

Overall, the public consultation process was duly followed (Table 2).

Table 3. Overview of public consultation periods conducated by Member State

Member state	Public consultation period
Belgium	1 July – 30 September 2021
Cyprus	April 2023 for 3 weeks
Germany	1 July – 31 December 2021

([327]) EE, FI, LT, LV, PL and SE
([328]) BE, CY, DE, FR, IE, NL, PT and SI
([329]) ES, IT and RO
([330]) IT and LT
([331]) CY and SI
([332]) FI and RO
([333]) BE, DE, ES, FR, IE, NL, PL, PT, SE, EE and LV
([334]) DE, FR, LV, PL and PT
([335]) BE, DE, ES, IE, NL, SE and PL
([336]) EE
([337]) IE and PL
([338]) IE
([339]) PL

Member state	Public consultation period
Estonia	15 December 2022 – 13 January 2023
Spain	8 July – 15 September 2022
Finland	1 February – 14 May 2021
France	20 May – 20 August 2021
Ireland	7 March – 30 May 2022
Italy	No information
Lithuania	No information
Latvia	15 November – 14 December 2022
Netherlands	20 October – 10 November 2020
Poland	7 July – 5 October 2021
Portugal	2 November – 3 December 2022
Romania	March 2022
Sweden	1 November 2020 – 30 April 2021
Slovenia	December 2021 – January 2022

While the majority of Member States were diligent in conducting a public consultation, they differ greatly in their responses about reporting information from the public consultation.

Two Member States ([340]) did not mention whether the views received from the public consultation were taken into account when finalising the programmes of measures. Seven Member States ([341]) reported taking into account the results of the consultation into the final programmes of measures. **They do not explain, however, to what extent the programme of measures was amended as a result** or which specific measures were added, adjusted or removed following the public consultation. Four Member States ([342]) provided **extensive information, both quantitative and qualitative, on the feedback received during the public consultation**. They all reported dedicating time to address the feedback using a comprehensive methodology and reported amending the programmes of measures resulting from the feedback received.

5.2 Cross-policy cooperation

Member States overall acknowledged the links between their MSFD Programmes of measures and other EU legislation (in particular the Water Framework Directive (WFD), the Maritime Spatial Planning (MSP) Directive, the Common Fisheries Policy (CFP), and the Habitats and Birds Directives). Member States described how policies and international agreements impact the update of their Programmes of measures and explained that **some of the measures included in their MSFD Programmes of measures are or will be delivered under other policies.** Most Member States, however, did not elaborate on the governance and coordination mechanisms between the different policies and the outcomes of these processes.

5.2.1 Cooperation across different authorities

Nine ([343]) out of 17 Member States clearly reported **coordination between the MSFD and the WFD** through measures that will be delivered under their national River Basin Management Plans (RBMPs) that will also address MSFD objectives related to D5 (Eutrophication), D8 (contaminants) and D9

([340]) RO and LV
([341]) DE, ES, FI, EE, IE, NL and SE
([342]) BE, FR, PL and PT
([343]) CY, DE, EE, ES, FI, LV, LT, PL, SI

(contaminants in seafood). Four Member States ([344]) provided **additional detail on the governance mechanisms** to coordinate, implement and monitor measures from the RBMPs and the second programmes of measures. The other eight Member States ([345]) described links between the MSFD and the WFD but **did not elaborate on the mechanisms and/or governance** for coordination or the outcomes of coordination.

Coordination between the MSFD and the WFD: examples

In Germany, coherence between the MSFD and WFD is ensured through work by LAWA (Federal Government/Länder Working Group on water issues) and BLANO (Federal Government/Länder Working Group on the North Sea and Baltic Sea). For example, both authorities established a common catalogue of measures which are relevant to both the objectives of the MSFD and the WFD. This catalogue will be updated according to the implementation cycles of the MSFD and the WFD.

In Spain, coordination occurs between competent authority for the implementation of MSFD (sub-directorate for the protection of the Sea of the Directorate General of the Coast and Sea) and the inter-community river basin districts who are responsible for the implementation of RBMPs. For example, the authorities responsible for the MSFD submitted contributions to the 2022-2027 RBMPs for ten inter-community river basin districts and thirteen intra-Community river basin districts during the consultation periods of the different RBMPs.

In Finland, coordination between the MSFD and the WFD was organised through close cooperation between planning systems at the ministerial, agency, and expert levels. For example, the Åland provincial government cooperated with the Ministry of the Environment and the Southwest Finland ELY Centre. Additionally, the Åland provincial government developed its own second Programmes of measures with strong consideration of the contents of its RBMP for the WFD.

Fourteen ([346]) out of 17 Member States provided high-level descriptions of the common objectives between the MSFD and the MSP in their text reports. **Thirteen Member States** ([347]) **included measures related to maritime spatial planning in their second programmes of measures.** For example, one Member State ([348]) included a measure on establishing areas that will be free from permanent anthropogenic interference via its maritime spatial plans, while another ([349]) included a measure on the review of the national maritime spatial planning framework every six years.

None of these Member States, however, provide information on coordinated governance for the two policies. Two Member States ([350]) provided information on the national legal framework for implementing maritime spatial planning in their marine waters and highlighted that the authorities responsible for delivering specific objectives under the MSFD are the same ones who are responsible for delivering their national maritime spatial plans.

5.2.2 Integration of EU policy objectives

Only a few Member States ([351]) explicitly refer to the broader objectives of the European Green Deal in their programmes of measures. On the other hand, **most of the Member States** ([352]) **mention links to the Biodiversity Strategy**, although specific reference to the target of 30% protected sea area of which 10% must be strictly protected (30/10 protection target) are limited. Many of the measures defined in the second programmes of measures contribute to the objectives of the Biodiversity Strategy, and in particular D1-related measures designating MPAs in areas of high human activity, but it is often unclear to what extent, in the absence of quantified data on these new designations. Member States **rarely**

([344]) ES, FI, DE and PL
([345]) BE, FR, IE, IT, NL, PT, RO, SE.
([346]) BE, DE, EE, ES, FI, FR, IE, IT, LV, NL, PL, PT, RO, SE,
([347]) CY, BE, DE, EE, ES, FR, IE, IT, LV, PL, RO, SE, SI.
([348]) PL
([349]) IE
([350]) CY and SE
([351]) BE, CY, NL, PT
([352]) BE, CY, DE, EE, FI, FR, IE, IT, LV, NL, RO, SE.

detail mechanisms and outcomes for coordination between the MSFD and the Zero Pollution Action Plan ([353]), however, clear linkages can be seen directly in the additional measures for litter, nutrients and contaminants identified in the second cycle.

As for the Fit for 55 package and the EU's target of reducing net greenhouse gas emissions by at least 55% by 2030, only two Member States ([354]) present initiatives that contribute to climate objectives, with one of them ([355]) aligning its National Energy and Climate Action Plan and the National Strategy for Adaptation to Climate Change with the MSFD programmes of measures. The other one ([356]) highlights the role of the MSFD in contributing to climate neutrality. Most Member States included measures that directly or indirectly relate to climate change in their Programmes of measures. It is, however, complex to understand the degree to which the measures contribute to tackling the climate crisis. More details are provided above in section 3.3.

Linking national Programmes of measures to EU policy targets

Latvia stands out among all Member States for its explicit presentation of European Green Deal priorities and how they are linked to the MSFD, as well as how governance in other regional and national policies is linked to achieve common Green Deal objectives. It also describes in detail how the objectives of the Biodiversity Strategy are incorporated into its marine and coastal management strategies. The country presents the Biodiversity Strategy in connection with other regional and national policies, which embrace the sustainable blue economy approach ([357]) and plan to contribute to the protection of 30% of the EU's marine area. It is finally one of two Member States to clearly link its MSFD Programmes of measures to the Fit for 55 climate targets.

5.3 Integration of socio-economic considerations into the design of the programmes of measures

5.3.1 Costs and benefits of MSFD programmes of measures

Out of the 17 Member States assessed, 16 Member States ([358]) reported performing a cost-benefit (CBA) and/or a cost-effectiveness analysis (CEA). Six Member States ([359]) performed such analyses for all new measures, while ten ([360]) only analysed some of their new measures. These analyses were useful and a timely input in the evaluation of the MSFD which was carried out in parallel.

Methodologies

Five Baltic Member States ([361]) carried out a **cost-benefit analysis** which involved a comparison between the total cost to implement the second programmes of measures against a quantitative estimate of the benefits of improvements in the status of the marine environment.

([353]) Only LV and CY do so explicitly: Latvia connects its delivery of the EGD through the ZPA and presents the HELCOM Baltic Sea Action Plan as a way to address issues like eutrophication and waste. Cyprus makes reference to the national plans compatible with ZPA without detailing their integration with the MSFD.
([354]) LV and CY
([355]) CY
([356]) SI
([357]) See the Communication on a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future COM/2021/240 final
([358]) BE, EE, DE, ES, FI, FR, IE, IT, LV, LT, NL, PL, PT, RO, SE and SI. CY also reported undertaking a CBA and a CEA but their text-based report only showed a categorisation of cost for each measure given three categories of high, low and medium.
([359]) ES, FR, SE, LV, LT and EE.
([360]) BE, DE, FI, IE, IT, NL, PL, PT, RO and SI.
([361]) FI, LT, LV, PL, SE.

One Member State ([362]) used a different approach by looking rather at the use of marine resources and **costs of degradation** ([363]). They reported that added value from activities related to the marine environment (e.g. fisheries, maritime transport, marine aquaculture, tourism) is estimated at EUR 545 million in 2016. They also reported that around 14,600 people (full-time equivalent) were employed in marine sectors and activities, representing 2.2% of total employment in the country.

The 'effectiveness' part of the **cost-effectiveness analysis** performed by Member States involved developing effectiveness criteria and using expert judgement to assess individual measures against these criteria ([364]). A number of Member States ([365]) **summarised the most and least cost-effective measures** and the descriptors they are relevant for. Only two Member States ([366]), however, explained how the CEA results influenced the selection of measures for their second-cyle Programmes of measures. Some Member States ([367]) stated that these analyses influenced the selection or prioritisation of their measures, but there is no sufficient information in their reports to demonstrate how this was done (e.g. abandoning measures due to poor cost-efficiency) and only details on the methodology for the CBA and/or CEA were provided.

Costs

Eight Member States ([368]) provided **a summary of the monetary amounts associated with implementing the measures**. The information, however, is not fully consistent: one Member States ([369]) provided information on the **budget** for their programme of measures, while seven others ([370]) provided information on the (estimated) **costs** attributable to measures for individual or groups of descriptors. Three Member States ([371]) presented the estimated costs of individual measures in the context of the CBA and/or the CEA. One Member State ([372]) provided a breakdown of the budget set aside for MSFD-related activities over the period 2022 to 2030 focusing on biodiversity and fisheries: EUR 5 million for monitoring, research, and nature restoration, EUR 14 million for maintenance of fisheries measures and EUR 19 million for restructuring and sustainability of the cutter fleet.

The cost of the second MSFD programmes of measures, as reported by Member States

Estonia reported a cost of EUR 46.3 million to implement their programmes of measures over the 2022 to 2027 period. These costs cover one-off and recurring costs.

Finland reported a cost of EUR 299 million for their programmes of measures over the period 2022 to 2027, with EUR 223 million for investments, EUR 59 million for direct costs, and EUR 9 million to cover the workload of authorities.

Lithuania reported a one-off cost of EUR 5.5 million plus EUR 0.5 million of recurring costs for their programmes of measures.

Latvia reported that the total direct financial cost of the measures is between EUR 2.473-2.533 million for the 2022 to 2027 programming period, or EUR 0.412-0.422 million on average per year.

Poland reported a total cost of PLN 2.9 billion for their second programmes of measures. They stated that this amount does not include running costs of some continuous measures.

Sweden estimated that in the period 2022 to 2040, the measures included in their second programmes of measures cost between SEK 0.18-0.87 billion, with a mid-point estimate of SEK 0.53 billion.

([362]) SI
([363]) Article 8c of the MSFD.
([364]) Not all Member States (e.g. IT, PT) reported on the methodology used for their cost-effectiveness analysis.
([365]) FR, EE, LV, LT
([366]) SE and PL
([367]) IT, LV, LT, NL, RO, SI
([368]) EE, FI, LT, LV, NL, PL, SE, SI
([369]) NL
([370]) EE, FI, LT, LV, PL, SE, SI.
([371]) LV, PL, SI
([372]) NL

Slovenia reported a total cost of EUR 18.23 million for their second programmes of measures over the period 2022 to 2027.

After adjustments of the data provided by six of these Member States ([373]) to reflect equivalent annual costs in EUR ([374]) and in 2020 prices ([375]), **MSFD measures in this second programmes of measures have been estimated at an average cost of 724 EUR per km2 of marine area per year** (Table 3).

Table 4. Cost of Measures for selected Member States

Member State	2022-2027 cost of marine measures national currency, current prices	Annual cost of marine measures national currency, current prices	Annual cost of marine measures EUR million, 2020 prices	Area of marine waters thousand Km^2	Annual unitary cost of marine measures EUR per Km^2
Estonia	46.3 (EUR mill)	7.7 (EUR mill)	6.9	36.6	188
Finland	299.0 (EUR mill)	49.8 (EUR mill)	48.6	82.5	589
Latvia	2.5 (EUR mill)	0.4 (EUR mill)	0.4	28.3	12
Lithuania	8.5 (EUR mill)	1.4 (EUR mill)	1.3	6.4	202
Poland	2 900.0 (PLN mill)	483.3 (PLN mill)	110.6	33.1	3 337
Sweden	530.0 (SEK mill)	88.3 (SEK mill)	2.6	155.6	17
Average					724.3

Sources: Member State reporting, ECB (Exchange rates), Eurostat (HICP) and WISE Marine (https://water.europa.eu/marine/countries-and-regional-seas/country-profiles)

Based on this data, the cost of MSFD measures for the entire marine waters of the EU can be estimated. For all measures included in the programmes of measures, i.e. also measures taken under other instruments, the total annual cost is EUR 5.8 billion ([376]). Based on Member States' reporting of the share of their measures that are specific to the MSFD (i.e. category 2 measures, 42%), the cost of **MSFD-specific measures for the entire EU marine area is estimated at EUR 2.4 billion per year.**

Benefits

In five Baltic Member States, benefits were estimated through primary economic valuation studies (e.g. contingent valuation) or through benefits transfer.

Quantifying the benefits from the marine environment: examples from three Member States

Finland reported benefits of achieving GES for selected descriptors in the Finnish waters of the Baltic Sea. They estimated, via benefits transfer from a willingness to pay study ([377]), that the present value benefits is EUR 2,351 million by 2040. These estimates are reliant on the assumption that GES is achieved for Descriptors 1, 3 and 6 by 2040, but not for Descriptor 5.

([373]) Slovenia's costs were not included in these calculations because their equivalent unit cost is an outlier due to very high costs reported against a small marine area. The average cost for Slovenia is estimated at: EUR 12,634 per km^2 per year.
([374]) Using the average ECB Euro foreign exchange reference rate where necessary: https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html; using the average exchange rate between the Euro and the Swedish krona and the Polish złoty over the period 01 January 2019 to 31 December 2020.
([375]) Using Eurostat harmonised index of consumer prices (HICP) data (HICP - annual data (average index and rate of change) [prc_hicp_aind$defaultview], downloaded from Eurostat on 21.02.2024)
([376]) Total km^2 of marine waters of 22 EU Member States (7 958 556) * average cost of minotring per km^2 (724) = EUR 5 764 104 242
([377]) The original contingent valuation study by Niemenen et al (2019) examined the benefits of achieving GES for all Descriptors. However, the benefit values reported in Finland's second Programmes of measures are only associated with a few Descriptors to reflect the assessments and conclusions in their Programmes of measures.

Latvia reported benefits valued at EUR 16.2 million per year for improvements in the marine environment and the provision of ecosystem services. These improvements are associated with improvements in biodiversity and with the reduction of eutrophication, of hazardous pollutants, of the introduction and impacts of invasive non-native species, and of marine litter.

Sweden reported present value benefits from additional ecosystem services of between SEK 0.96 – 12.50 (approximately EUR 0.08-1.09) billion over the period 2022 to 2040. These benefits are assumed to result from the reduction of pressures from the marine environment and were estimated via a willingness to pay study.

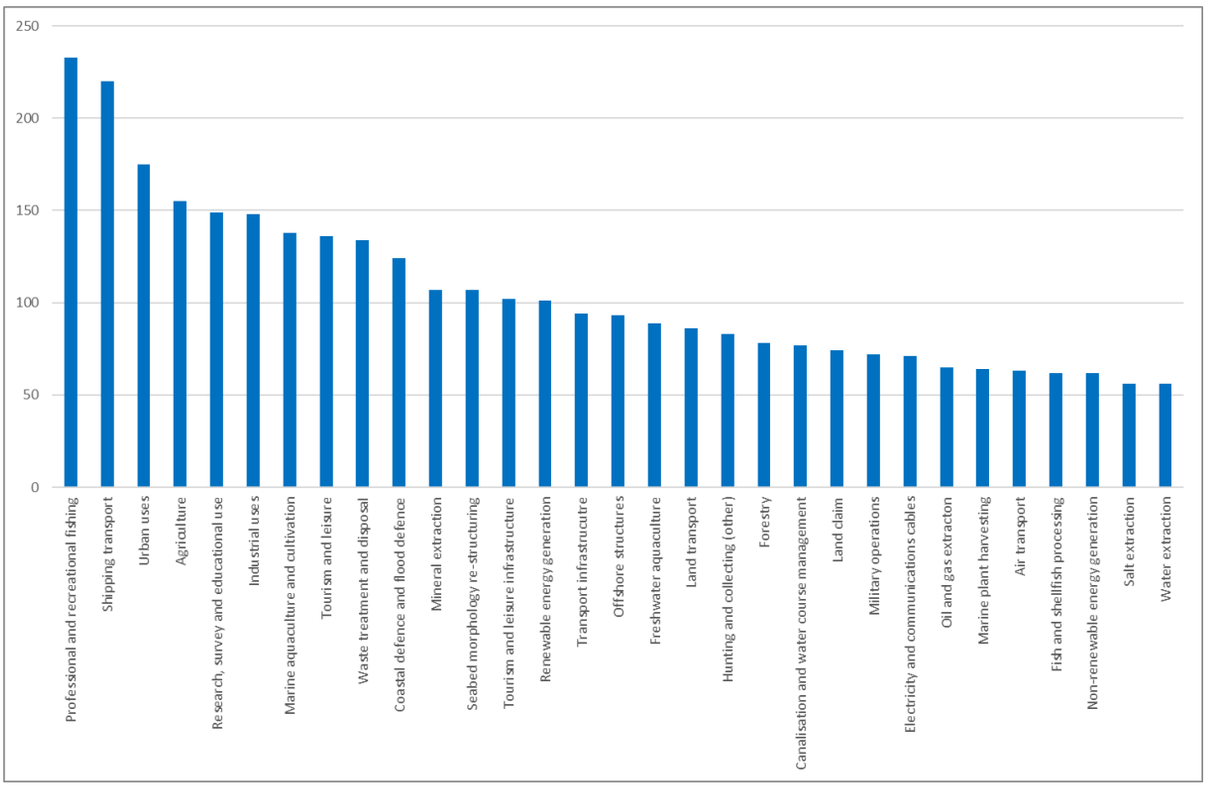
Two Member States ([378]) provided **qualitative descriptions of expected improvements** in ecosystem service benefits expected from the new measures in their second programmes of measures. For example, one Member State ([379]) reported that the measure to promote the use of more environmentally friendly alternative antifouling products is expected to reduce pollution in the marine environment thus resulting in healthier bathing waters and recreation benefits.

5.3.2 Economic and social impacts of MSFD measures

Eight Member States ([380]) provided in their text-based reports qualitative information **on the activities and sectors whose operations will be affected due to the implementation of their second programmes of measures**. For example, two Member States ([381]) provided summaries of individual measures that include information on sectors or social groups that need to be involved in the implementation of the measure. A number of Member States reported on the activities addressed by some of their MSFD measures. While it is not clearly defined how the measures 'address' the different activities, it can be assumed that it shows activities that are likely to be most impacted by MSFD measures. The graph below summarises this information, showing the number of measures reported against different activities ([382]). **Fisheries (commercial and recreational) and shipping are the top two activities** addressed by MSFD measures, with 233 and 220 measures respectively (Figure 13).

([378]) ES and BE
([379]) BE
([380]) CY, DE, EE, ES, FI, FR, LV and SE.
([381]) CY and EE
([382]) Some measures cover more than one activity, therefore the information presented in the graph will not equal the number of measures reported by the 17 Member States.

Figure 17. Number of measures that address a specific activity



Only two Member States([383]) also covered aspects related to social issues and human well-being. There is no information in these Member States' reports, however, to indicate that they further investigated the impacts of measures on particularly vulnerable groups, the social acceptability of the measures or the distribution of impacts across groups or generations. Additionally, there is no information on how these Member States used the results of these assessments in the selection of measures. The other fifteen Member States did not investigate social issues or impacts. They only reported undertaking stakeholder and public consultation wherein they raised awareness of the second programme of Measures.

Consideration of social and human well-being in the second programmes of measures

Finland examined the well-being improvement that may result from the implementation of the programmes of measures, represented by indirect effects on human health, living conditions and comfort. For example, they described how measures on eutrophication will reduce toxic algal blooms and improve the cleanliness of beaches, which are expected to benefit human health and coastal aesthetics.

Estonia included a category of human well-being and health in their cost-effectiveness analysis, where this category also covers local community, traditions, cultural heritage and employment. They indicated if each individual new measure is expected to have a positive, negative or no impact on this category. For some measures, they also provided qualitative descriptions of expected improvements in this category of human well-being and health. For example, Estonia stated that a reduction in marine litter is expected to have significant impacts on human well-being and health.

([383]) FI and EE

5.3.3 Funding MSFD measures

All Member States reported on the source of funds that will be used to implement their second programmes of measures. 16 Member States ([384]) will be **mobilising a mix of national** ([385]) **and EU funds**, with some Member States ([386]) listing EU funds for over half of their measures (and up to 80%). Nine Member States ([387]) also mentioned the **mobilisation of funds from the private sector**. Some Member States ([388]) describe this as costs to the private sector to adhere to measures that are implemented (e.g. as a capital investment) while others ([389]) refer to funding provided by environmental foundations for the implementation of MSFD measures.

Sixteen out of 17 Member States clearly reported the use of EU funds that will support the implementation of their second programmes of measures. Of these, two Member States ([390]) only referred to 'EU funds' without more details. One Member State ([391]) did not explicitly provide information regarding the use of EU funds, although they mentioned mobilising a "recovery fund" ([392]) for the implementation of new measures. Fourteen Member States ([393]) named the types of EU funds they are expecting to use for individual measures. Thirteen of the 17 Member States ([394]) mentioned the use of the **European Maritime, Fisheries and Aquaculture Fund (EMFAF)** (or its predecessor the European Maritime and Fisheries Fund (EMFF), six Member States ([395]) mentioned the **LIFE Programme**, and three Member States ([396]) mentioned the **Horizon Europe research programme**. Other EU funds mentioned by Member States include the Common Agricultural Policy, the Cohesion Fund, the European Social Fund Plus, the NextGeneration Recovery and Resilience facility, the European Regional Development Fund, the Connecting Europe Facility (Transport), the European Agricultural Fund for Regional Development and the INTERREG Programme ([397]).

The use of EU funds for the implementation of the MSFD

The Netherlands reported that EUR 5 million is available from EMFAF for specific MSFD measures and research, although they did not elaborate on what types of measures or for which descriptors this funding will target.

Lithuania provided estimates of funds they foresee to be made available from the Cohesion fund and ERDF, EAFRD, EMFAF, Horizon Europe and the LIFE programme. They also provided estimates on the amount they will mobilise from the fund to support MSFD measures, and examples are below.

- Cohesion Fund and ERDF: EUR 440 million for measures affecting the water sector.
- EARDF: almost EUR 787 million for measures to contribute to the improvement of the environmental status of surface waters.
- EMFAF: EUR 5.4 million for more sustainable fishing practices; EUR 2.45 million income support in case of loss of income due to permanent or temporary cessation of fishing activities; EUR 4.5 million for the protection and restoration of aquatic biodiversity and ecosystems; EUR 730.000 for the fisheries management to protect birds and compensation for damage caused by protected marine mammals.

([384]) Excluding IT.
([385]) Some Member States only refer to a general 'national' fund, while some reported details on the level of governance (e.g. regional, local) from which the funds are expected to come from.
([386]) Data from the e-reporting shows that EU funds are mentioned in 80% of RO measures, 59% of PT measures, 50% of SI measures and 49% of CY measures.
([387]) DE, ES, FI, LT, LV, PL, PT, SE, SI.
([388]) LV and LT
([389]) DE and PT
([390]) ES and SI
([391]) IT
([392]) It is possible that Italy referred to EU recovery funds, but this is not made explicit in IT's reporting.
([393]) BE, CY, DE, EE, FI, FR, IE, LT, LV, NL, PL, PT, RO, SE.
([394]) This excludes IT, ES, SI and FI.
([395]) BE, FR, PT, RO, CY and LV.
([396]) LV, PT and RO.
([397]) There are instances where Member States have referred to Programmes that are funded by other sources, e.g. the Operational Programme for Large Infrastructure that is funded by the Cohesion Fund and the Regional Development Fund.

5.4 Evidence of member states' commitment to implement the measures

Article 13 of the MSFD requires Member States to ensure that measures are cost-effective and technically feasible and to carry out impact assessments (including cost-benefit analyses) prior to implementation of new measures. Article 22 states that implementation of the MSFD '*shall be supported by existing community financial instruments*', and '*co-financed by the EU*', while Article 6 of the Directive emphasises regional coordination and cooperation. The Directive also recognises overlaps with other existing EU Directives (e.g. the Habitats and Birds Directives, the Water Framework Directive) and policies (e.g. maritime policy and the Common Fisheries Policy).

Based on these, four key factors were defined to assess the likelihood of Member States implementing the new measures they have included in this second cycle of implementation, namely:

1. **Consideration of the socio-economic impact** of new and additional measures in the development of their programme of measures.
2. **Sources of financing**, including the use of EU funds.
3. **Coordination with key EU policies** and regional cooperation ([398]).
4. **Information on the implementation** on where, how and when the modified and additional measures will be implemented ([399]).

The scores ([400]) for each one of the factors were aggregated into an overall qualitative score of the likelihood of implementation (Table 4).

Table 5. Overall score on the likelihood of implementation

Score	High	Medium-High	Medium	Medium-Low	Low	Total
Member States	9	4	2	1	1	17 MS

Out of the 17 analysed Member States, a total of **13 Member States are considered to have a high or medium-high likelihood of implementing the new and additional measures**, two Member States are considered to have a medium likelihood and two Member States are considered to have a medium-low or low likelihood that they will implement the new or additional measures from their second programme of measures.

Individual scores and justifications are presented together with Member States' conclusions in the next chapter but the following conclusions can be drawn for all 17 Member States.

With respect to **the socio-economic impact** of the new and additional measures, one Member State ([401]) obtains a full score as it undertook adequate analysis of the economic impact of the measures to support their selection. In addition, it examined short-term and long-term impacts on activities and well-

([398]) This includes: the Common Fisheries Policy (CFP), the Habitats and Birds Directives (HBD), Maritime Spatial Planning (MSP) and the Water Framework Directive (WFD), among others.
([399]) 'Where' relates to the spatial coverage; 'how' relates to the operationalisation (e.g. description of the measure, authority responsible for implementation, the mode of action for implementation (e.g. technical, legislative, economic and financing); 'when' relates to the temporal scope.
([400]) A Member State is assigned a score, ranging from high to low, given their performance against all four Key Factors. The overall score for a Member State reflects commitment in implementing their second Programme of Measures. The score against each Member State was also reviewed relative to the scores of other Member States to ensure consistency and comparability.
([401]) EE

being. Seven Member States ([402]) obtain a partial score either because of partial analyses of both economic and social impacts or because social issues were not investigated, despite a good economic analysis. The remaining eight Member States ([403]) carried out only partial economic analyses (mainly in relation to only a few measures) and did not investigate social issues at all. Finally, one Member State ([404]) made some qualitative categorisation of the measures but did not perform an economic impact analysis nor investigate the social impacts of the measures.

With respect to the **sources of funding**, four Member States ([405]) provided clear information on sources (coming from the national budget or from EU funds), including amounts and breakdowns. When relevant, additional funding from municipal, port or private sources are also reported. Twelve Member States ([406]) listed the different sources but without indicating the total amounts, the amounts allocated to specific measures or if the funding has been secured. In one Member State[407] the information on financing sources is very limited.

With respect to the **coordination with key EU policies** and **cooperation with Regional Sea Conventions and international agreements**, one Member State ([408]) reported that the core of its proposed programme of measures corresponds to existing and planned measures from other policies (mainly the WFD, the HBD, the CFP and the MSP). In addition, it described in detail its participation in different regional and international agreements and organisations. In eleven Member States ([409]) this is only achieved partially, either because the links with other policies are mentioned but not the mechanisms of coordination, or no information on the authorities for implementing and coordinating the measures is provided. In four Member States ([410]) the information is even more partial as only refers to some of the measures. In one Member State ([411]), relevant policies connected with the programme of measures were identified, but very scarce information on coordination with neighbouring countries was provided.

With respect to the **implementation of measures**, six Member States ([412]) obtain a very high score by providing the details on where, how and when six to ten new measures will be implemented. In seven Member States ([413]) those details are provided to about four to six measures. In three Member States ([414]) details on implementation are provided for only two or three measures. Finally, one Member State ([415]) does not report any new measure in its second programme of measures.

6. Member State conclusions

The technical assessments ([416]) on which this part of the annex is based analyse Member States' reporting

([402]) DE, FI, FR, LT, LV, PL, SE
([403]) BE, ES, IE, IT, NL, PT, RO, SI
([404]) CY
([405]) CY, LT, LV, PT
([406]) BE, DE, EE, ES, FI, FR, IE, NL, PL, RO, SE and SI
([407]) IT
([408]) CY
([409]) BE, EE, ES, FI, FR, IE, NL, PL, PT, SE and SI
([410]) DE, LT, LV, RO
([411]) IT
([412]) SE, EE, LT, DE, PL and FI
([413]) PT, LV, FR, BE, ES, RO and SI
([414]) IT, IE and NL
([415]) CY
([416]) The technical Member State-specific assessments were prepared for the Commission by an external consultant and are found at https://environment.ec.europa.eu/topics/marine-environment/implementation-marine-strategy-framework-directive_en#second-implementation-cycle-2018--2023

of their programmes of measures per descriptor, under Article 13(9) of the MSFD. This part of the annex provides a summary assessment of the strengths and weaknesses of the measures included by Member States in their programmes of measures for each descriptor identified in Annex I of the MSFD.

The assessment ([417]) looked in particular at how measures address the relevant pressures, as identified by Member States in their 2018 Article 8 assessments, and support the achievement of targets and ultimately GES, as well as how specific and direct measures are, whether implementation mechanisms are well-explained and timing and spatial scope clearly reported ([418]).

The assessment focused on measures reported as having been taken specifically for the MSFD. Therefore, **it does not prejudge conclusions regarding the effectiveness of certain measures to address pressures regulated by other frameworks** (e.g. nitrates directive, WFD, CFP, etc.).

The assessment also looked at how Member States have addressed cross-cutting issues, such as the integration of climate change in their programmes of measures, coordination with other authorities and assessing the socio-economic impacts of the programmes of measures. Member States' programmes of measures have been assessed as 'adequate', 'moderately adequate' or 'not adequate' ([419]) to address pressures and contribute to achieving GES and targets, based on the assessment of their measures and cross-cutting issues. Based on these conclusions, a set of recommendations were drawn up and assigned to Member States (Section 7).

6.1 Belgium

Summary:

Overall, the second programme of measures presented by Belgium is considered as adequate to address the pressures acting on the Belgian marine environment and contributes to achieving Belgium's GES and targets.

In terms of strengths, Belgium has carried out multicriteria analyses for the selection of new measures, followed by CBA/CEA analyses for specific measures and detailed gap analyses leading to adoption of appropriate measures, in particular for D1, D10 and D11. In addition, Belgium shows leadership with D11 by covering not only noise but also other sources of energy, showing a good anticipation of future threats.

On the downside, Belgium does not describe well coordination mechanisms across different authorities for the implementation of measures stemming across different policy/sectoral areas (e.g. environment/ fisheries) and does not seem to have considered social issues in its socio-economic assessment. New measures for eutrophication and contaminants have been assessed as only moderately adequate to address the pressures. It should be noted that in its 3rd RBMP under the WFD, Belgium has asked for an exemption for its coastal surface water body for ecological status on grounds of technical feasibility, disproportionate costs and natural conditions and for chemical status on grounds of disproportionate costs and natural conditions.

Based on the information reported in their programmes of measures, Belgium's commitment to the implementation of their second programme of measures has been assessed as 'medium-high'.

The adequacy of Belgium's programme of measures for **cross-cutting issues** is considered **moderate**.

The second programme of measures of Belgium did not have major changes since the first MSFD cycle in terms of methods applied for measures selection, reported links between the MSFD and other policies, regional and/or international cooperation, and public consultation. Belgium respected the MSFD reporting guidelines in terms of information that needed to be reported.

([417]) The methodology used for the assessment of adequacy is provided in the Member States' technical reports.
([418]) The weight of the different criteria used to assess the programmes of measures were adapted in the case where Member States have reported already having achieved GES for a certain descriptor in 2018.
([419]) 'Not adequate' covers countries with 'poor adequacy' and 'very poor' adequacy scores.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The selection of measures relied on a multi-criteria analysis. Additional qualitative information was provided by Belgium on cost categories (e.g. preparation cost, implementation cost, personnel cost), and benefits assessed (e.g. increased fishing production, scientific value, etc.). Quantitative information (on costs and benefits) was provided when it was possible.	Concerning the social issues, Belgium did not present any indication of considered social issues and analysis to support the development of the programmes of measures.
 **Interactions with climate change**	Belgium considered the effects of climate change on the marine environment while developing/ elaborating on the updated programme of measures. Belgium's 3rd RBMP also assesses the main impacts of climate change on the coastal water body, e.g. storm related floods, coastal erosion and loss of natural wetlands.	Belgium did not report any information on how climate change considerations were taken into account in measures selection notably on i) reducing greenhouse gas emissions, or ii) enhancing adaptive capacity and resilience of marine ecosystems. It is also unclear if the proposed measures are part of the climate change adaptation strategy of the country or not.
 **Links to other policies**	Belgium refers to links between MSFD and other EU policies, namely WFD, MSP, CFP, and BHD. Coordination between MSFD and the different directives was pointed out for different measures targeting different descriptors, such as eutrophication (D5) and pollutants (D8 and D9) for the WFD.	Belgium did not mention any additional information concerning mechanisms and outcomes of coordination. No further information was given by Belgium on whether all EU funding opportunities were seized or not, and on amounts mobilised by each funding source and sectors/descriptors targeted.
 **Regional cooperation and transboundary impact**	At regional level, Belgium cooperated with the neighbouring countries within OSPAR which helped Belgium in measures selection. New measures were defined based on the programmes of measures of the neighbouring countries. At international level, Belgium cooperated with other countries through different international and European treaties and agreements (e.g. International Maritime Organization, EU Integrated Maritime Policy, and Convention on Biological Diversity).	Belgium did not specify if the transboundary impacts of proposed measures have been assessed or not. It could be assumed that transboundary impacts were discussed with neighbouring countries, yet it is not clear from the text whether this was the case.
 **Public consultation and administrative process**	Belgium electronic reporting provided a clear indication of the responsible/ competent authority for the implementation and coordination (at national, regional, and international levels) of each measure. Comments from different stakeholders were considered, when relevant, in the final programme of measures. In its RBMP Belgium seemed to indicate a higher level of engagement with the public and stakeholders	There is no indication of the evolution of the administrative process since the first cycle.

Topic	Strengths	Weaknesses
	who apparently continue to be involved in their implementation	

The adequacy of Belgium's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5 – Eutrophication		
Adequacy		The adequacy of Belgium's programme of measures for D5 is considered moderate
Strengths		- Eutrophication pressures and relevant measures are well understood. - Measures are in place to address many of the key pressures contributing to eutrophication. - A gap analysis has been carried out and has identified the main land-based pressure sources as river input coming from, inter alia, run-off of agricultural activities, urbanisation and industry (including ports). - Belgium has provided some of the necessary information on where, when, and how the modified and additional MSFD specific measures will be implemented.
Weaknesses		- The gap analysis does not assess the extent to which individual measures may contribute to pressure reduction and thus to achieving GES. - Updates to measures from other relevant frameworks, in particular WFD or National Emissions Ceiling Directive, are not mentioned by Belgium under D5 unlike measures adopted under other EU legislations, which seems to be an omission, despite identifying the relevant pressures in their gap analysis. It is of particular importance as Belgium's RBMP highlights that in its coastal water body, eutrophication is caused mainly by nutrient pollution from agriculture and to some extent point source industrial pollution from upstream, all of which need to be tackled under land-based legal frameworks. - The MSFD-specific measures are not linked to operational targets. - Implementation and financing of the measures remain unclear. - It is unclear whether the measures are complete and will fully address the pressures and therefore whether and when GES might be achieved for D5: industrial emissions remain unaddressed and agricultural run-off are addressed via an indirect measure only.
Progress since 2016		- In 2016 the coverage of pressures was assessed as partial as there were identified gaps relating to agriculture and industry. In 2022, the coverage is also assessed as partial. - In 2016, the programme of measures was considered to only partially cover all components of GES and targets as there were identified gaps relating to agriculture and industry. There is no progress in 2022 as the targets are not sufficiently developed and are not considered as operational.
D8 – Contaminants		
Adequacy		The adequacy of Belgium's programme of measures for D8 is considered moderate.
Strengths		- The key pressures contributing to excessive concentrations of contaminants in the marine environment are well identified. - Belgium has provided some of the necessary information on where, when, and how the additional MSFD-specific measures will be implemented.
Weaknesses		- The gap analysis does not quantify gaps or indicate the extent to which measures will address the pressures and does not identify how specific measures contribute to achieving GES. - It remains unclear whether and when GES might be achieved for D8. Belgium's 3rd RBMP concludes that its coastal water body is not in good chemical status especially because of uPBT substances, such as mercury, PAHs and PBDEs. - Measures from other relevant frameworks, in particular WFD or National Emissions Ceiling Directive, are not mentioned by Belgium under D8 unlike measures adopted under other EU legislations, which seems to be an omission. Belgium's RBMP shows however that Belgium is

	taking measures under WFD of high relevance to D8 under the MSFD, including prohibition to use tributyltin (TBT) in shipping, waste management plans in harbour areas, quality control of sediments discharged in sea areas, incident management or the ban of use of certain pesticides in aquaculture and lead in fisheries. - The MSFD-specific measures, which include the restoration of estuarine ecosystems, are only 'partially' linked to operational targets, many of which have previously been assessed as poor. - Implementation and financing of the measures remain unclear.
Progress since 2016	- In 2016 pressures had been assessed as being fully addressed by the programmes of measures. In 2022, the coverage is considered to be partial because the gap analysis does not provide sufficient information. - In 2016, the programme of measures was assessed as covering all components of GES and targets. In 2022, coverage of GES and targets is considered only partial because most of the targets are considered not to be operational by the Commission.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Belgium's programme of measures for D9 is considered very good
Strengths	- GES is achieved and measures are in place (in relation to D8 which will benefit D9) to address many of the key pressures contributing to concentrations of relevant contaminants in fish and shellfish flesh. - Additional MSFD specific measures identified for D8 will help to ensure that GES for D9 continues to be achieved.
Weaknesses	- None identified.
Progress since 2016	- In 2016, the coverage of pressures for D9 had not been addressed because Belgium did not provide sufficient linkage to measures under D8 which relate to many of the key pressures on seafood contamination. On the other hand, the programme of measures was considered to partially cover all components of GES and targets. - As GES is achieved, and no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made.
D10 — Marine litter	
Adequacy 	The adequacy of Belgium's programme of measures for D10 is considered good
Strengths	- Belgium reports a clear gap analysis for D10 marine litter, including the need for progress on microlitter, as well as targeting hot spots for marine litter input (e.g. incl. ghost nets). - The additional MSFD specific measures are considered adequate to address the main pressures for D10 (commercial shipping, fisheries, tourism, etc.). - All the measures are linked to the environmental targets reported under Article 10. - Belgium provides adequate details on how and where the measures will be implemented. - Belgium shows that it will be following up closely on the development of clear indicators for micro-litter (TG Litter). - Belgium also makes correct reference to the EU Threshold levels for beach litter and to operational objectives set by OSPAR (2021-2030).
Weaknesses	- All the measures are linked to the environmental targets reported under Article 10; however, these were considered not operational because they either referred to reduction of the pressure as a trend or to the desired level of a pressure (ingested litter) in fulmar. - Belgium does not specify a temporal scope for its measures. - References to the EU level recent policy developments such as the Zero Pollution targets are missing.
Progress since 2016	- Belgium's measures have not deteriorated. In both reporting cycles, the measures address the relevant pressures and activities identified in Belgium's Article 8 reporting. - Following the gap analysis, Belgium has included additional MSFD specific measures that target litter hot spots. Micro-litter is also better covered in this second cycle, although via 'soft measures' (development of indicators).

	- No progress was made regarding the coverage of environmental targets.

D11 — Underwater noise and energy	
Adequacy	The adequacy of Belgium's programme of measures for D11 is considered very good.
Strengths	- Belgium has clearly identified the gaps with regard to D11 and addressed them in the updated programme of measures. - Belgium provides a clear and well-thought programme of measures in the current cycle and addresses well the most pressing issues linked to D11. - Belgium has taken a pro-active stance and shows it has a vision for the future by including other energy sources such as electromagnetic fields, light and heat when addressing D11. This precautionary stance is commendable and should be taken as an example when addressing continuous noise as well, which is another energy source with many knowledge gaps. - New measures proposed in the current cycle are well described. - Belgium includes a measure related to other forms of energy input which was missing in the previous cycle.
Weaknesses	- Description of MSFD specific measures should include an overall implementation plan including a time schedule (e.g., start/end date etc.) - The measures partially address the D11 GES and targets.
Progress since 2016	- Belgium's report on D11 'Energy, including underwater noise' under Article 13 has slightly improved since 2016. - In 2016 Belgium identified marine-based renewable energy, defence operations, marine research, and shipping as key activities contributing to underwater noise, but shipping was covered by an indirect measure (communication and raising awareness). This gap is now partially addressed with the additional MSFD specific measure on optimisation of work/maintenance access routes during the construction of new wind farms or other offshore infrastructure.

The adequacy of Belgium's programme of measures to address biodiversity issues is considered **good**.

Biodiversity

D1 — Biodiversity	
Adequacy	The adequacy of Belgium's programme of measures for D1 is considered good
Strengths	- A detailed gap analysis is provided for the areas which need to improve to progress towards GES. - Good amount of detail is reported for each new and updated measures, which allows to see the potential success of these measures. - A cost-benefit analysis is conducted for each measure, considering what is required for each stage of implementation and subsequent monitoring. - Adequate links between measures and pressures are made, with each of the measures presented addressing pressures reported under D1 in Article 8. - Reporting of new spatial protection measures is sound, with a large amount of detail provided. - Measures have been put forward to reduce the disturbance for seabirds, key marine mammal species such as harbour porpoises and seals, and sharks and rays. The implementation of new spatial protection measures will also address pressures for pelagic habitats.
Weaknesses	- Links between environmental targets and new measures are not always clear. - Several of the updated and new measures still aim to increase knowledge gaps and collect new data rather than manage pressures. - Stronger justification is needed for reasons to update or withdraw existing measures. - More information is needed on coordination between fisheries and environmental authorities for measures that implement change in fishing regulations.

	- More information is required on where spatial protection measures will take place and how large these areas will be. - A clear link to how these new spatial protection measures contribute to other EU legislation, such as Biodiversity Strategy targets, would help to set these measures in the bigger picture. - Ecosystem structure is an aspect of the GES definition which could benefit from more work. - The measures do not cover all the different aspects of Belgium's GES definition for all four species groups.
Progress since 2016	- Progress has been made in the coverage of pressures by addressing species disturbance, which is a significant and relevant to all four species groups. - Progress has been made with regards to the coverage of GES and targets. All targets presented by Belgium for D1 in Article 10 are covered by at least one new or updated measure.
D2 — Non-indigenous species	
Adequacy	 The adequacy of Belgium's programme of measures for D2 is considered **moderate**
Strengths	- Belgium has identified all relevant gaps in achieving GES for D2C1 in terms of the main pathways of introductions and acknowledged that more could be done to reduce the introduction of NIS via shipping. - Three additional MSFD specific measures have been identified which all aim to reduce the introduction of NIS and ultimately achieve GES for D2C1.
Weaknesses	- It is not clear if the introduction of the 8 NIS since the last reporting period were due to the shipping sector or other pathways. - The new measures do not address the potential introduction of NIS through aquaculture or offshore windfarms which are deemed to be potential pathways in the future in the gap analysis. - More information could have been provided on how some of the additional MSFD specific measures will be implemented.
Progress since 2016	- Some progress has been made since 2016 with respect to the coverage of pressures, with all pressures being adequately covered by the additional MSFD specific measures. - While the 2016 assessment recommended that Belgium address aquaculture as a pathway of introduction, Belgium considers aquaculture as not a priority due to the low number of marine farms (one mussel farm) in Belgian waters. No new measures are implemented to address this pathway as it is unlikely to be affecting the current status of GES. - Similar to 2016, the measures being implemented from the second programmes of measures are likely to prevent the introduction of NIS through improved management of NIS pathways shipping.
D3 — Commercial fish and shellfish	
Adequacy	 The adequacy of Belgium's programme of measures for D3 is considered **moderate**
Strengths	- Belgium undertook a gap analysis and has provided justifications for the revised programmes of measures. - The additional MSFD specific measures partially address the priority pressures identified by the gap analysis and are linked to targets. - Belgium provides information on where and how the additional MSFD specific measures will be implemented.
Weaknesses	- Some aspects of the gap analysis were not included (progress against targets, estimate of how much existing measures will reduce pressures). - The measures represent monitoring actions to improve knowledge rather than actions specifically to reduce pressures and achieve targets. - Belgium does not state when the measures will be implemented, nor provide a timeframe for achieving GES in the future.

	- There are discrepancies between the e-reports and text report, with regards to both modified and additional MSFD specific measures. As a result, it is unclear which measures are linked to D3 in the updated programmes of measures. - The updated Programmes of measures, however, still does not include measures specific to aquaculture. - It is not clear whether the additional MSFD specific measures are linked to operational environmental targets.
Progress since 2016	- Some progress has been made by Belgium regarding coverage of pressures and achieving GES. - The 2016 assessment concluded that whilst the D3 measures addressed the key pressure identified in Belgium's Article 8 reporting, i.e. extraction of species, fish and shellfish, aquaculture was not addressed which had been identified as a key activity contributing to this pressure. As mentioned before, however, Belgium considers aquaculture as not a priority due to the low number of marine farms (one mussel farm) in Belgian waters. - The 2016 assessment concluded that the measures addressed the D3 GES and targets, although, it is not clear whether the additional measures are linked to operational environmental targets.
D4 — Foodwebs	
Adequacy 	The adequacy of Belgium's programme of measures for D4 is considered **poor**
Strengths	- None identified.
Weaknesses	- No real gap analysis is presented for D4, meaning the reasons for not attaining GES are not identified. - The only new and updated measures reported as relevant to D4 are the D1 overarching and general measures. This means that there is no plan to ensure that D4 is addressed, it will just be an indirect impact from D1 efforts. - Although there are clear overlaps between D1 and D4, this does not mean that D4 should not be reported and assessed in its own right.
Progress since 2016	- No definite conclusion can be made as to whether Article 8 pressures are addressed by the measures, because Article 8 was not reported for D4 in 2018. - Both the new and updated measures which are reported under D4 are reported to be relevant to targets for D1 only, as targets are still yet to be set for D4. Therefore, no progress has been made with regards to meeting GES for D4 as no specific targets have been set, and any progress continues to only be made as a side effect of work on other descriptors.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Belgium's programme of measures for D6 is considered **good**
Strengths	- Belgium provides a detailed gap analysis of the areas in which improvement is needed to progress towards GES. Belgium clearly links the gaps found in the 2016 programmes of measures with the new and updated measures presented in the 2021 programmes of measures. - A good amount of detail is reported for each of the new and updated measures in the 2021 programmes of measures. - A cost-benefit analysis has also been conducted for each measure, considering what is required for each stage of implementation and subsequent monitoring. - Belgium pairs the new and updated measures with relevant pressures and targets well. - The links drawn between the new and updated measures and D6 environmental targets are also strong.
Weaknesses	- More information on coordination between fisheries and environment is needed with regards to measures implementing change in fishing regulations. - Stronger justification is needed for reasons to update or withdraw existing measures. Three of the four withdrawn measures are relevant to the health of the seabed, covering the banning of fishing in seabed protection zones and the implementation of gravel bed restoration areas.

	Belgium should clarify what is different about the new measures, and why they are more likely to work than those which have been withdrawn.
Progress since 2016	- Overall, progress has been made since 2016, and pressures are addressed better even if not fully yet. - The pressures are only partially addressed due to the size of the areas to be protected. In order to see significant difference in the quality of the seabed habitat, large areas will need to be protected to allow communities to regrow. - Belgium is looking into quantifying these pressures, which will make a significant positive difference in future programmes of measures. - As in 2016, the new measures cover the environmental targets, and contribute towards achieving GES.

D7 — Hydrographical changes	
Adequacy	 The adequacy of Belgium's programme of measures for D7 is considered **very good**
Strengths	- A new measure is introduced to better assess cumulative impacts from all human activities considering future large projects and infrastructures that are likely to cause hydrographic changes (including windfarms and coastal defense projects). - This methodological development could provide strong support to a more holistic implementation of MSFD in the future, in general, and progress towards GES for D7 in particular, but should be carried at a wider scale and higher level than national ones (e.g. OSPAR). - Other measures are reported in the text report that could have positive impacts on the achievement of GES for D7.
Weaknesses	- Belgium did not assess the status of GES in its EEZ for D7. - The new measure introduced is not specific to D7, nor directly linked to environmental targets defined for D7 and its temporal framework is not defined. - There are some discrepancies between the e-reporting and the text report.
Progress since 2016	- In 2016, Belgium's programme of measures for D7 was assessed as "No conclusions" as there were no measures reported for D7. The report in 2022 has substantially improved; existing measures are reported, a gap analysis has been carried out and three additional MSFD specific measures have been proposed, which also address weaknesses identified in 2016, although all of them are indirect measures.

Based on the information reported in their programme of measures, Belgium's commitment to the implementation of their second programme of measures is assessed as '**medium-high**'.

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
CEA and CBA for some new measures, but no detail on how these affect measures selection. No information on social impacts of measures.	Presented EU and national financing sources that will be mobilised to implement the second programme of measures. Three EU funds are planned to be used: EMFAF, LIFE Programme and Green Deal, but no	Links between with CFP, MSP, WFD and HBD are highlighted in terms of common objectives and measures. Mechanisms for coordination is not mentioned.	Where: Measures for seven descriptors (D2, D3, D5, D7, D8, D10, D11) have sufficient details (e.g. Belgian EEZ in the North Sea) of spatial coverage. Measures for three descriptors (D1, D4, D6)

indication of amounts from each of them and if funding has been secured.	Regional cooperation via OSPAR for status assessments and objective, and done through governmental agencies and MSFD working groups.	have partial details of spatial coverage ([420]). How: Measures for three descriptors (D1, D2 and D3) have sufficient details on operationalisation, and measures for six descriptors (D2, D5, D6, D7, D8 and D11) have partial details. Details are unclear for D4 measures. When: Measures for four descriptors (D1, D4, D6, D8) have partial details, and measures for another four (D2, D3, D7, D10) have no details. Measures for two descriptors (D5 and D11) do not have clear details.

6.2 Cyprus

Summary:

Overall, the second programme of measures presented by Cyprus is considered moderately adequate to address the pressures acting on the Cypriot marine environment and partially contributes to achieving Cyprus' GES and targets.

In terms of strengths, Cyprus has provided high-level information on sources of financing, i.e. national budget and EU funds including those under the 2021-2027 Multi-annual Financial Framework, to support implementation and enforcement of the measures. They have also made progress in describing how relevant measures are associated and coordinated with other key EU policies and legislation (e.g. the WFD, MSP, CFP and HBD). To support the selection of new measures, Cyprus has carried out gap analyses, integrating the outcomes of the data from their monitoring programmes for a number of descriptors.

Cyprus has, however, often not reported where they currently stand with regard to GES, reducing the effectiveness of the gap analysis and the selection of effective new measures. For several descriptors, measures have been considered as adequate (D5, D8, D9) or moderately adequate (D6, D10, D7), for others they have been considered as not adequate (D1, D2, D3, D4). Measures for underwater noise (D11) have been assessed as particularly poor.

Based on the information reported in their programme of measures, Cyprus' commitment to the implementation of their second programme of measures has been assessed as 'medium-low'.

The adequacy of Cyprus' programme of measures for **cross-cutting issues** is considered **moderate**.

The assessment of the MSFD programme of measures pointed out that CY did not report on its efforts to coordinate MSFD implementation with national, European and regional processes. Cyprus made progress on this topic for its second programme of measures describing efforts to coordinate such processes.

Topic	Strengths	Weaknesses

([420]) Belgium did not report modified and additional MSFD specific measures for D9.

Socio-economic assessment	A qualitative categorisation of financial costs is presented for each measure.	Cyprus did not undertake cost-benefit nor cost-effectiveness analyses on the measures included in the second programme of measures. There is neither reporting nor assessment on the social impacts of the measures.
Interactions with climate change	Climate change is recognised as a cross-cutting issue in the programme of measures.	Cyprus does not provide information to indicate that impacts of climate change and contributions towards climate change efforts have been considered in the technical and economic assessment of the measures.
Links to other policies	Cyprus provided information on national and EU funding to support implementation and enforcement of the measures, and they provided details on how relevant measures are associated and coordinated with other key EU policies and legislation (e.g. the WFD, MSP, CFP and HBD). The programme of measures includes measures that can be linked to European strategies and action plans such as the European Green Deal, Biodiversity Strategy, Zero Pollution Action Plan, and Fit for 55.	Cyprus does not describe if and how coordination between the MSFD and other EU legislation has evolved since the MSFD programme of measures. The programme of measures does not present detailed information on the outcomes of coordination of the MSFD with the national and EU strategies.
Regional cooperation and transboundary impact	Cyprus described its participation in different regional and international agreements and organisations related to marine environment issues. They also provide information where measures have been developed on coordination with other countries via regional and international agreements.	Cyprus does not provide information on any transboundary impacts of the measures or the assessment of transboundary impacts in the second programme of measures. They only stated that the implementation of national laws will not create risks or negative impacts to other countries.
Public consultation and administrative process	Cyprus provided details on the process to implement the second programme of measures, including legislation under which these measures are enforced, authorities responsible for implementation, the timeline for implementation and further processes required. They also reported on the rationale for changes to measures from the MSFD programme of measures.	Cyprus does not report any information on the public consultation process.

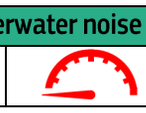
The adequacy of Cyprus programme of measures to address **pollution** issues is considered **moderate.**

Pollution

D5- Eutrophication

Adequacy 	The adequacy of Cyprus' programme of measures for D5 is considered **good**.
Strengths	- The programme of measures acknowledges the measures in the 3rd River Basin Management Plan (RBMP) of the Water Framework Directive. Incidentally, these were not submitted in time to be integrated into the Commission's assessment of WFD's RBMPs and cross-checking could not be done. - The gap analysis takes into account WFD and MEDPOL monitoring data. - Cyprus reports that GES is currently achieved for D5[421].
Weaknesses	- The 3rd RBMP measure are not identified as an updated existing measure. - References to Zero Pollution targets, the continuing work of the Barcelona Convention and the updates to the National Emissions Ceiling Directive are missing. - The gap analysis does not include all the elements expected, a baseline scenario, the consideration of how much current measures will continue to reduce pressures, or future socio-economic developments.
Progress since 2016	- In 2016, it was considered that coverage of pressures had been addressed, pending clarification of WFD status. The situation in 2022 remains the same. - In 2016, it was considered that the measures addressed the components of GES and targets, again pending results from the WFD assessment. The situation remains the same in 2022.
D8-Contaminants	
Adequacy 	The adequacy of Cyprus' programme of measures for D8 is considered **good**.
Strengths	- The gap analysis takes into account the WFD and MEDPOL monitoring data as well as trends in oil spills and illegal discharges. - Cyprus reports that GES is currently achieved for D8. - Measures are in place to address the main anthropogenic pressures (introduction of synthetic and non-synthetic compounds, and accidental pollution) and activities (industry, agriculture, urban activities, and shipping). - To maintain GES, Cyprus defines additional measures to strengthen its approach in tacking contaminants by port activities and sulfur emissions.
Weaknesses	- The gap analysis is missing a baseline scenario, consideration of how much current measures will reduce pressures, and future socio-economic developments. - There is no reference to WFD RBMPs as an existing measure for D8, nor of updates in the 3rd RBMP. - The references to Zero Pollution targets, the continuing work of the Barcelona Convention and to the updates to the National Emissions Ceiling Directive are missing.
Progress since 2016	- In 2016, it was considered that coverage of pressures had been addressed and it was considered that the measures addressed the components of GES and targets. - As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Cyprus' programme of measures for D9 is considered **good**.
Strengths	- The gap analysis takes into account the WFD and MEDPOL monitoring data. - Cyprus reports that GES is currently achieved for D9, thus no updates were made to the measures. - The measures, combined with the D8 measures, address the relevant pressures (introduction of hazardous compounds) and activities (industry, agriculture, urban activities, shipping). .
Weaknesses	- There is no reference to WFD RBMPs as an existing measure for D8, nor of updates in the 3rd RBMP.

[421] Although it should be noted that nutrient concentrations (D5C1) were reported as in not good status in 2018 on the basis of WFD assessments.

	- The references to Zero Pollution targets and the continuing work of the Barcelona Convention are missing.
Progress since 2016	- In 2016, it was considered that coverage of pressures had been addressed and that the measures addressed the components of GES and targets. - As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made.
D10 — Marine litter	
Adequacy 	The adequacy of Cyprus' programme of measures for D10 is considered **moderate**
Strengths	- The modified and additional measures from other initiatives for D10 are clearly listed and the text report includes a short description of each of these measures and a link with the achievement of the GES. - The gap analysis explains how knowledge gaps on beach litter and litter impacts on turtles (*Caretta caretta*) have been filled over recent years and how gaps still exist for litter on the seabed and floating (micro)plastics. Efforts are made to fill in these gaps.
Weaknesses	- There is no reference to the Zero Pollution targets. - No results or status of the efforts to fill in the knowledge gaps are listed and Cyprus has also not included any modified or additional MSFD specific measures aiming to fill these gaps in its second programme of measures. - Some pressures such as micro-litter and mortality of *Caretta caretta* are not addressed by the existing measures, and no modified or additional MSFD specific measures for D10 have been included in the programme of measures. - Cyprus does not report whether GES for D10 has been achieved or not and when GES is expected to be achieved.
Progress since 2016	- The adequacy of Cyprus programme of measures for D10 has not improved since the previous assessment. - In 2016, it was considered that the measures partially addressed the reported pressures and activities as for second programme of measures. - In 2016, it was considered that the measures partially addressed GES and targets. This is still the case in 2022.
D11 — Underwater noise and energy	
Adequacy 	- The adequacy of Cyprus' programme of measures for D11 is considered **very poor**
Strengths	- Cyprus highlighted its participation to two EU-funded projects on underwater noise in the Mediterranean Sea (QuietMED2 and QuietSEAS). Benefits from those projects are considered as contributing to the gap analysis. - Reference to the recommendations of setting thresholds made by TG Noise is acknowledged.
Weaknesses	- No conclusions or summary of findings from the QuietMED2 and QuietSEAS projects are presented in the text report, and no rational, plan or measures are built upon and take advantage of the results of those projects. - No information is provided on whether the two existing measures from the first cycle that are specific to D11 will be enough to achieve GES. - No measure is proposed to achieve the threshold's value.
Progress since 2016	- No progress has been made on D11. - In 2016, coverage of pressure was considered partially adequate, and it is still the case in 2022. - As in 2016, Cyprus still does not report any D11-related targets, it is therefore impossible to assess whether the measures will contribute to achieving them.

The adequacy of Cyprus programme of measures to address **biodiversity** issues is considered **poor.**

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Cyprus' programme of measures for D1 is considered poor
Strengths	- The gap analyses identified knowledge gaps which need to be addressed to improve progress towards GES.
Weaknesses	- The reporting of the updated existing measure does not provide an adequate explanation on how they will ensure progress towards GES. - Despite the identification of gaps in knowledge, no new measures are put forward by Cyprus to fill in this gap. - The absence of new measures is not justified as GES is not achieved. The design of species or habitat specific measures is challenging given the limited knowledge and the lack of gap analysis to identify areas for improvement; however, this does not prevent the implementation of new precautionary measures such as the designation of new protected areas or the design of measures for pressures, such as by-catch, are well-known in the Mediterranean. - It is difficult to confirm that the updated programme of measure will allow Cyprus to meet GES in the relevant timeline.
Progress since 2016	- In 2016, it was considered that the measures only partially addressed pressures and environmental targets. In 2022, little progress has been made in the areas identified for improvement in 2016. - In 2016, it was considered that the measures entirely addressed pressures effecting and targets relating to fish. No progress has been made as no further measures have been put in place to reduce pressures or increase knowledge.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Cyprus' programme of measures for D2 is considered poor.
Strengths	- Cyprus has clearly explained how the updates/changes to the existing measures under other frameworks from the first cycle contribute to achieving GES. - The link between modified/additional measures under other frameworks and the other policies is clear and relevant, and relevant KTM are reported. - A description of these measures for D2 and their current status is provided, and relevant pathways of introduction are reported to be well framed by existing measures.
Weaknesses	- GES was not assessed under Article 8 and only a qualitative assessment is presented in the programme of measures. Cyprus therefore does not have a baseline scenario to assess NIS introductions. - It is not clear whether Cyprus has adequately identified all significant gaps to achieve targets and GES. - Environmental targets were also not reported by Cyprus under Article 10 in 2018 and no supporting explanation was provided.
Progress since 2016	- In 2016, measures were considered to have partially addressed the relevant pressures. In 2022, no new measures have been identified in the second cycle. An additional existing measure has been introduced for shipping. - In 2016, measures were considered to address GES and targets. In 2022, no new measures have been identified in the second cycle and it is not clear from the report how and to what extent the existing measures are contributing to achieving GES.
D3 — Commercial fish and shellfish	
Adequacy 	- The adequacy of Cyprus's programme of measures for D3 is considered poor
Strengths	- Measures considered part of the monitoring programme are removed. - Cyprus more clearly links measures to the delivery of the CFP requirements by consolidating D3 measures under one overarching measure covering implementation of CFP Fisheries Legislation and International Fishing Obligations.
Weaknesses	- The gap analysis states GES has been achieved for D3 however does not provide adequate evidence to support this statement. GES was not achieved for D3 in 2018.

	- It is not clear whether Cyprus has adequately identified all significant gaps to maintain targets and GES. - Cyprus has only partially explained how updates to the existing measures contribute to achieve GES. - Cyprus has not updated any of the existing measures from the first cycle of the programme of measures.
Progress since 2016	- In 2016, it was concluded that Cyprus had partially addressed MSFD needs to progress towards GES but it was not clear whether all commercial fish species were addressed. In 2022, Cyprus did not change any of its measures but just consolidated them in a single measure. - In 2016, it was considered that the relevant GES and target components were addressed by the programme of measures for national species but with a lack of links reported to the CFP. Cyprus addresses this recommendation in 2022.
D4 — Foodwebs	
Adequacy 	The adequacy of Cyprus's programme of measures for D4 is considered poor
Strengths	- The programme of measures includes a description of the methodology followed to modify the measures and improve progress towards GES.
Weaknesses	- A gap analysis has not been completed for food webs and it therefore not possible to conclude whether GES has been met and what progress has been made towards GES and environmental targets. - There remain no targets dedicated to descriptor 4. - There is a lack of knowledge regarding food web health in Cypriot waters. - The updated measure is only to research potential protected areas, and not to implement them. This measure is indirect and does not contribute to achieve GES. - References to D4 are only made as an addition to the biodiversity status of species and habitat groups.
Progress since 2016	- No real progress appears to have been made with regards to introducing measures which are well aligned to identified gaps in progress. - In 2016, the measure partially addressed both pressures and environmental targets. Once again, this descriptor has been reported and therefore assessed as a part of descriptors 1 and 6, and not in its own right. Progress since 2016 is therefore extremely limited, if not absent.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Cyprus's programme of measures for D6 is considered moderate.
Strengths	- The programme of measures includes the methodology followed to define the measures. - The additional existing measures introduced in the programme of measures will contribute to reduce disturbance to coastal seabed habitats.
Weaknesses	- The gap analysis is not detailed and fails to outline the current status of seabed habitats in Cypriot waters and the progress made towards the outlined environmental targets. - The additional existing measures are at a small scale when compared to the Cypriot EEZ. This implies that these measures are not sufficient to cause significant progress towards GES without being paired with new measures.
Progress since 2016	- In 2016, it was considered that measures partially addressed pressures. Progress has been made since 2016, as Cyprus has introduced two additional existing measures which address coastal defences and their disturbance of the seabed and port operations. - With regards to environmental targets, the 2016 assessment stated that they were mostly covered. Progress has also been made since 2016 with regards to environmental target coverage.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Cyprus's programme of measures for D7 is considered moderate
Strengths	- Cyprus has updated its GES determination for D7 since its report under Art. 9.

	- The additional measures from other initiatives that will support port projects and activities and coastal protection projects to SEA and EIA are considered adequate to reduce pressures linked to D7 and contribute to achieving GES.
Weaknesses	- The gap analysis is limited. - Studies on the expected developments of activities likely to alter hydrographical conditions in the future are missing. - No explanation is given on how the modified existing measure can limit permanent alteration of hydrographical conditions. - No reference is given to measures under WFD, nor to regional or cross-border cooperation in this field.
Progress since 2016	- Cyprus has progressed in the definition of its GES, but neither provides the assessment of the contribution of the existing measures to achieve GES, nor information about future evolution of pressures linked to hydrographical conditions

Based on the information reported in their programmes of measures, Cyprus' commitment to the implementation of their second programmes of measures is assessed as '**medium-low'**.

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
Did not undertake a CBA or CEA. Categorised cost of measures into low, medium and high with no comparison on effectiveness. Described groups that need to be involved in the implementation of measures, but no information on social impacts of measures.	Provided information on financing sources (e.g. national sources, EMFAF, NextGeneration EU's recovery and resilience facility), but did not provide estimates on amounts expected from each funding source.	Reported that the core of its proposed programme of measures are existing and planned measures from the WFD, the HBD, and the CFP. There is a horizontal measure on the implementation of Maritime Spatial Planning. Described participation in different regional and international agreements and organisations, and named the national agencies responsible that contribute to or participate in these. Reported examples of outcomes from cooperation, such as proposed actions on integrated coastal zone management.	Cyprus did not report any additional MSFD specific measures for their second programme of measures.

6.3 Germany

Summary:

Overall, the second programme of measures presented by Germany is considered to be adequate to address the pressures acting on the German marine environment and contributes to achieving Germany's GES and targets.

In terms of strengths, Germany presents a very complete and clear list of measures supported by solid gap analysis. The reporting is supported by tables providing clear links between measures and German targets and presenting the impacts of measures on ecosystem components. The impacts of climate change on the marine environment were considered while selecting measures.

On the downside, there is a lack of clarity on how some previous measures have evolved and how recent policy developments have fed into the measure selection process. There is also a lack of information on the outputs of the CEA/CBA and some doubts regarding funding of the programme of measures.

Measures for eutrophication, contaminants, litter, noise, biodiversity, invasive species, seafloor integrity and hydrological changes are all considered adequate, whereas measures for food webs and commercial fish and shellfish are considered only moderately adequate and measures for contaminants in seafood are considered to be poor.

Based on the information reported in their programmes of measures, Germany's commitment to the implementation of their second programmes of measures has been assessed as 'medium-high'.

The adequacy of Germany's programme of measures for **cross-cutting issues** is considered **good**.

The second programme of measures did not show major changes as compared to the MSFD programme of measures in terms of methods applied for measures selection, reported links between the MSFD and other EU policies, regional and international cooperation, and public consultation.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The measures selection was carried out by taking into account different factors: technically feasible, cost-effective, and by undertaking an impact assessment including cost-benefit analysis. The methodology followed was well described and reported in the programmes of measures. Qualitative information on cost categories was given (when relevant) for each measure. The benefits were estimated in market value and non-market value of environmental improvements. Regarding social issues, the impacts of measures on employment and changes in human activities were assessed.	Germany undertook the CEA and CBA for all new measures (52 new measures) and whenever possible for existing measures. Germany did not provide additional information on the influence of the methodology on the final list of measures. Germany did not provide any additional information presenting the methodology and outcomes of the social assessment making it difficult to understand how social assessment influenced the measures selection.
 **Interactions with climate change**	Germany investigated a) the adaptive capacity of measures (able to respond to future changes in water temperature, displacement of plankton, rains, etc.), and b) how the measures help in preserving ecosystems and their ecosystem services which contribute both to climate change adaptation and mitigation. In Germany's 3rd RBMP under the WFD, a climate check was also undertaken to select the measures by checking the two above items.	The quantification and impact of measures on GHG reduction and on socio-economic activities were not presented. Some methodologies might be missing.

Links to other policies	The programme of measure refers to the links between the MSFD and other EU policies. Coordination is the strongest with WFD and was done at the level of both the Federal Government and Länder. On the contrary, it was identified that some of Germany's RBMPs include only superficial reference to the MSFD and that the coordination between competent authorities is limited in particular when it comes to land-based pollution sources for the marine. Cooperation between the MSFD and other EU legislations (MSP, CFP, BHD, and BS) also existed and was presented in the programme of measures text. For the second cycle, coordination with the CFP also took place (this element that was not mentioned in the MSFD programme of measures) The funding sources are well described.	Germany did not provide further information on the mechanisms and outcomes of such cooperation, making it difficult to understand synergies and outcomes of such cooperation, notably regarding measures' selection. Germany did not provide any additional information on the amounts mobilised from each source allowing to understand priorities and targeted sectors and descriptors. Also, uncertainty still exists regarding EU funding opportunities. It was not clear from the text if all EU funding opportunities have been seized or not.
Regional cooperation and transboundary impact	Regional cooperation is carried out through OSPAR and HELCOM with Germany playing an active role in the respective committees. The transboundary impacts of the proposed measures were identified, assessed and notified to neighbouring countries	Trilateral Wadden Sea Cooperation is mentioned with no further details.
Public consultation and administrative process	The consultation included all the measures, and the environmental report and provided supplementary fact sheets for each measure. The general public's views were received and revised. Prior to the public consultation, the different stakeholders from the economic and environmental sectors were consulted and a couple of workshops were carried out with governments and NGOs. Germany presented well the administrative framework to implement the programme of measures and their responsible authorities.	It is unclear how stakeholders' views effectively led to modifications between the draft programme of measures and the final version of the programmes of measures. There is no indication in the programme of measures of any evolution in the administrative process that has been made since the first cycle.

The adequacy of Germany's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy Germany's programme of measures for D5 is considered good.

Strengths	- Eutrophication pressures and relevant measures are well understood. - Several additional measures have been identified to address the key pressures and activities contributing to eutrophication. - Germany has updated the existing measures, based on the 3rd RBMP programme 2022-2027, in particular the amendments for the transposition of the Nitrates Directive as well as the HELCOM Baltic Sea Action Plan 2021-2030. - Germany has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses	- The gap analysis does not quantify the extent to which specific measures contribute to achieving GES noting that their effectiveness will depend on how and to what extent they are implemented. - The updated and additional new measures address the identified pressures. However, it is unclear whether the measures will sufficiently address the pressures due to uncertainties concerning how and the extent to which measures will be implemented. - The assessment of Germany's 3rd RBMP considers that the lack of setting and achievement of maximum nutrient loads impedes the achievement of the objectives of both WFD and MSFD. - The detail of some of the measures is lacking, for example, financing for some of the measures remain unclear.
Progress since 2016	- In 2016 it was considered that pressures for D5 had been covered, as in 2022. - In 2016 it was considered that the measures addressed the definitions of GES and targets, as in 2022.
D8-Contaminants	
Adequacy 	The adequacy of Germany's programme of measures for D8 is considered **good**.
Strengths	- Contaminant pressures and relevant measures are reasonably well understood while recognising the complexities of multiple diffuse sources entering the sea via rivers. - Several additional measures have been identified to address the key pressures and activities contributing to contaminants. - Germany has updated the existing measures, based on the 3rd RBMP programme 2022-2027, the HELCOM Baltic Sea Action Plan 2021-2030 and OSPAR North-East Atlantic Environment Strategy 2021-2030 as well as the Gothenburg Protocol and the National Emission Ceilings Directive. - Germany has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses	- Not all measures have yet been implemented. - The gap analysis does not quantify the extent to which specific measures contribute to achieving GES, noting that their effectiveness is uncertain due to limited monitoring data on the effectiveness of current measures and the persistent nature of some contaminants. - The detail of some of the measures is lacking, for example, financing of some measures remain unclear.
Progress since 2016	- In 2016 it was considered that pressures for D8 had been covered, as in 2022. - In 2016 it was considered that the measures addressed the definitions of GES and targets, as in 2022.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Germany's programme of measures for D9 is considered **poor**.
Strengths	- The information provided on the modified new measure is reasonably complete
Weaknesses	- The gap analysis does not clarify the extent to which GES for D9 is currently being achieved nor how existing or modified measures contribute to achieving GES for D9 - It is unclear whether financing has been secured. - The analysis for D8 is relevant to D9, which is not stated and links between D8 and D9 are not made. - There is no specific consideration of pressures in relation to D9

Progress since 2016	- In 2016 it was considered that pressures for D9 had been covered, whereas in 2022, it is considered that measures cover pressures only poorly. - In 2016 it was considered that the measures addressed the definitions of GES and targets, whereas in 2022 it is considered that the coverage of components of GES and targets is poor because there is no specific consideration of pressures in relation to D9.
D10 — Marine litter	
Adequacy 	The adequacy of Germany's programme of measures for D10 is considered **good**.
Strengths	- Litter pressures and relevant measures are reasonably well understood and linked to targets DE put forward. - Measures reported by DE address all key pressures for marine litter, and focus both on primary criteria D10C1 and D10C2, as well as secondary criterion D10C3. - Among existing measures, the new EU Single Use Plastics Directive and RSC Action plans for respectively North Sea (through OSPAR) and Baltic Sea (through HELCOM) have been taken into account in the second programme of measures, which also refers to the EU Beach Litter threshold value. - The Annex 1 to the text-based report provides an overview of detailed fact sheets for each modified or additional MSFD specific measure with all detailed information on the description, method of implementation, spatial coverage and timeline towards implementation.
Weaknesses	- The second programme of measures is somewhat confusing on the existing measures in the e-reporting versus text-based report (and annexes) - The targets are partially operational. - Other recent EU-level and regional developments regarding marine litter, such as the Zero Pollution targets, are not mentioned. - Quantification of how much the existing measures from the first cycle and updated existing measures will reduce anthropogenic pressures such as fisheries, shipping, municipal waste and riverine input of litter is not reported. - Funding is not yet secured for all measures. - Timelines for implementation of additional MSFD specific measures are not mentioned.
Progress since 2016	- The adequacy of Germany's measures for D10 has not deteriorated compared to 2016. - In 2016 it was considered that pressures for D10 in both Germany's North Sea and Baltic Sea were covered, which remains valid for 2022. - In 2016 it was considered that the measures addressed the definitions of GES and targets, as is the case in 2022. - Compared to 2016, the second programme of measures for D10 provides clearer timelines for implementation of the different measures
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Germany's programme of measures for D11 is considered **good**.
Strengths	- Germany provides a clear description of the actions planned for the new programmes of measures. - Germany introduces an interesting concept of a low-noise area for marine species. - Underwater noise pressures and relevant measures are reasonably well understood and linked to two targets put forward by the Member State. - The measures reported address all key pressures for underwater noise and focus both on primary criteria D11C1 and D11C2. - Among existing measures, the RSC Action plans for respectively North Sea (through OSPAR) and Baltic Sea (through HELCOM) have been taken into account in the second programme of measures. - Germany addresses other anthropogenic energy sources such as light, which is expected to be reduced thanks to the measure's implementation.

Weaknesses	- Quantification of how much the existing measures from the first cycle and updated existing measures will reduce anthropogenic pressures is not reported. - Individual measures planned in the first cycle have not yet been fully effective. Specifically, with regards to D11 Germany states it is not possible to estimate whether current measures are sufficient to achieve good environmental status. - Funding is not yet secured for all measures. - There is no relevant measure on electromagnetic forces emissions
Progress since 2016	- Germany 's report on D11 has not deteriorated. - Both in 2016 and 2022 the measures address all of the pressures and activities identified in Germany's Article 8 which cause noise inputs. - As for the targets, both in 2016 and 2022 the measures are considered comprehensive and address all aspects of the GES definition, except the one on electromagnetic forces emissions.

The adequacy of Germany's programme of measures to address **biodiversity** issues is considered **good.**

Biodiversity

D1 — Biodiversity		
Adequacy		The adequacy of Germany's programme of measures for D1 is considered very good.
Strengths		- Germany provides a very strong gap analysis and successfully identifies areas which are preventing the achievement of GES. - An effort has been made to design new measures to fill these gaps, as analysis showed that without these new measures, GES would not be met. In particular, Germany clearly addresses the pressures derivated from fishing activities. - The measures put forward in the programme of measures will protect certain habitats, such as seagrass and reefs and measures are developed for noise mitigation. - The practicalities of the new measures are well reported. - The reporting of the new MPA supplementary measure is also comprehensive, with links made to the current MPA areas as well as other policies such as the 30x30 target of the Biodiversity Strategy.
Weaknesses		- The gap analysis is lacking the timescale over which it is now expected that GES will be achieved. - There are uncertainties regarding the implementation of measures, especially regarding the coordination e.g. regional cooperation, it is unclear and financing of some of the measures is not secured yet. - Follow-up measures regarding more complete management plans for Natura 2000 sites of the EEZ, habitat loss, and fisheries would be needed to completely address the pressures and achieve the desired status. - For pelagic habitats, Germany does not clearly identify how these measures will address relevant pressures on this habitat. Hence, the measures partially address the pressures on these habitats. - For seabed habitats, the programme of measures does not provide information on how a number of activities causing these pressures are addressed.
Progress since 2016		- With regard to the pressures addressed, progress has been made since 2016. Germany has now addressed the pressure of fisheries, a pressure not previously addressed by the 2016 programme of measures, which is significant and relevant to all species groups, including measures that promote ecosystem-friendly fishing gear. Measures have been put forward to protect certain habitats, such as seagrass and reefs. - The coverage of environmental targets and GES, in 2016 were considered addressed by the measures reported for birds, mammals, fish, and cephalopods. However, they were partially addressed for pelagic and seabed habitats. Germany did not present specific

	measures for water column habitats through measures addressing species groups of D1.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Germany's programme of measures for D2 is considered good.
Strengths	- Gaps for achieving GES under D2 were adequately identified within the programme of measures, namely that new measures and implementation of current measures are required to further address current rates of NIS introduction. - The new and modified measures aim to reduce the number of NIS introductions through shipping both indirectly and directly, similar to 2016. - The new measures for D2 continue to address the environmental target, which is linked to reducing the total number of introduced species to zero in order to achieve GES. - These measures all address the D2 operational target by aiming to achieve the target value/indicator of a decreasing trend in the introduction of new NIS. - Germany generally clearly states how and when the new measures will be implemented.
Weaknesses	- More could be detailed on the different pathways of introduction and acknowledging potential gaps more specifically. - It is unclear whether the implementation of some measures (e.g. the new measure as accounting for addressing NIS introductions in mariculture) is specifically linked to D2. - There is a confusion over the measure which addresses aquaculture activities, as it did not always appear to be clearly linked to D2.
Progress since 2016	- Germany partially addresses pressures with the new/modified measures in 2022 whereas it was considered that the 2016 measures fully addressed pressures. - Germany have maintained good coverage of the GES and environmental targets since 2016.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Germany's programme of measures for D3 is considered moderate.
Strengths	- The 2022 programme of measures aims to reinforce and better implement the first cycle of measures and expand the spatial scope of implementation of one measure. - Germany describes the lack of achievement of environmental targets, but also identifies progress in setting quotas in line with MSY targets and reducing fish mortality. - A gap analysis has been carried out and identifies failures in implementation of existing measures and reasons for not currently achieving GES. - Local/nationally managed fish stocks outside the scope of the CFP quota regulations are addressed in some measures. - Germany provides details on where, how and when the modified measure will be implemented.
Weaknesses	- The gap analysis is considered partially adequate. - Age- and size- structure is not explicitly addressed. - It is not clear whether all relevant stocks are covered. - It is not clear whether mortality from recreational fishing is adequately considered and addressed. - A timeframe for achieving GES in the future is not provided. - The measure is linked to environmental targets, but the targets were not considered operational in the Art 12 assessment. - It is not clear whether the modified new measures will fully address all aspects of the source of the relevant pressures (e.g. commercial and recreational fishing, and on CFP and nationally managed stocks).

Progress since 2016	- In 2016, it was concluded that Germany had addressed the key pressure (i.e. extraction of species, fish and shellfish). In 2022, coverage of pressures by modified and additional MSFD specific measures is assessed as partially addressed. - This is a slight improvement overall, but some concerns remain over whether the programme of measures adequately addresses all sources of pressures on fisheries (e.g. including recreational fisheries) and the extent to which locally/nationally managed stocks are covered.
D4 — Foodwebs	
Adequacy 	The adequacy of Germany's programme of measures for D4 is considered moderate.
Strengths	- The overall gap analysis (all biodiversity descriptors together) is very strong. - The gap analysis clearly identifies gaps in progress to GES as a whole, and the new measures have been designed to address these gaps. - It is made clear that without the changes made to the programme of measures 2021, GES would not be reached for descriptor 4. - The reporting of measures is also strong. All new measures are linked to relevant operational environmental targets which were presented in Article 10. - The practicalities of where each new measure will be implemented are also reported fully. - The reporting of the new MPA supplementary measure is comprehensive, with links made to the current MPA areas as well as other policies such as the 30x30 target of the Biodiversity Strategy.
Weaknesses	- Detail of the current environmental status for descriptor 4 is missing. - Methodologies for the assessment of the quality of food webs in German waters are less developed than those for biodiversity and seabed integrity, meaning the current status of food webs is less well known. - All pressures are grouped together it is not clear whether the measures are addressing some of the specific pressures on food webs. - Schema fields were missed for both how and when the new measures will be implemented. - The lack of specific pressures reported in Article 8 under descriptor 4 makes it hard to determine the relevance of the new measures to these pressures.
Progress since 2016	- The assessment of progress for D4 has been made together with D1.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Germany's programme of measures for D6 is considered good.
Strengths	- The gap analysis provided is very strong and successfully identifies the gaps in the 2016 programme of measures which prevented the achievement of GES under descriptor 6. - The analyses clearly present the current status of the environment and why GES has not been achieved. - Main pressures are identified, in this case, bottom trawling. - New measures have then been designed in order to fill these gaps. - The reporting of modified and additional MSFD specific measures is also strong. All measures are well linked to both relevant pressures and operational environmental targets. - The practicalities of the new measures are well reported. - The reporting of the new MPA supplementary measure is also comprehensive, with links made to the current MPA areas as well as other policies such as the 30x30 target of the Biodiversity Strategy.
Weaknesses	- The only area in which the gap analysis is lacking is the timescale over which it is now expected that GES will be met.

	- More specific measures could have been presented to directly address bottom trawling, taking into account the identification of this activity as the main pressure for the seabed. - Information is missing with regard to how implementation will take place, specifically, regarding the coordination between agencies and countries as well as securing funding for some measures. - The impact of human-made structures on seabed habitats has not been sufficiently addressed and the programme of measures does not include measures which aim at protecting seabed habitats from destructive offshore activities, apart from noise input or in MPAs.
Progress since 2016	- In 2016 the measures were considered to partially cover the pressures. In 2022 clear progress has been made, with 10 new updated and additional MSFD specific measures under descriptor 6, which all address pressures reported under Article 8. - In 2016, the measures were considered to partially address the targets for seabed habitats. In 2022, it is uncertain if progress has been made regarding this because some measures are reported to be linked to targets that are not reported under Art.10 or in the 2022 programme of measures.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Germany's programme of measures for D7 is considered good.
Strengths	- The programme of measures adequately linked to the WFD programmes of measures and to actions at regional level (HELCOM and OSPAR). This is supported by the fact that Germany has included the largest number of measures in relation to hydromorphological alterations in its 3rd RMPB under the WFD. The extent to which these will have an impact on hydrographical conditions in coastal waters is however not fully clear. - A gap analysis has been carried out. - The 2022 programme of measures covers all relevant pressures and all GES components. - Germany provides an assessment of progress against the environmental targets. - Germany provides adequate details on where, how and when the two measures will be implemented.
Weaknesses	- A gap analysis is considered partially adequate. - Germany does not report any modified or additional MSFD specific measure relevant for D7 in the e-reporting. However, in the text report, one additional measure relevant to D6 in the NEA Greater North Sea region is mentioned as being relevant to D7 as well in view of the expected sea level rises due to climate change. - The two measures considered in the update are linked to environmental targets, but the targets were not considered operational in the Art. 12 assessment.
Progress since 2016	- Like the first cycle's programme of measures, the 2022 Programme of measures covers all relevant pressures and all GES components. - The 2022 report clearly refers to the first cycle programme of measures report; no significant progress has been detected, the only changes are linked to improving the implementation of 2016 measures and building on measures implemented at regional level (HELCOM).

Based on the information reported in their programme of measures, Germany's commitment to the implementation of their second programme of measures is assessed as '**medium-high**'.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when

CEA and CBA for new measures which helped in measures selection. Social assessment of measures focused on impacts on employment and activities.	Named the funding sources to support second programme of measures: the federal government fund, länder fund, EU fund (e.g. EMFAF, Interreg), environmental foundations fund, and other funding sources (e.g. other policies sources of financing for new measures). Did not provide information on amounts from each EU funding or if funding has been secured.	Presented links between the MSFD, the WFD, the CFP, the MSP and the HBD. Provided details of coordination between the MSFD and the WFD (i.e. working groups in LAWA and BLANO) only. Regional cooperation is achieved via HELCOM (Baltic Sea), OSPAR (North Sea), and TWSC (Wadden Sea). The second programme of measures takes into account HELCOM and OSPAR actions and include regional measures.	Where: Measures for ten descriptors have sufficient details on spatial coverage; and measures for one (D9) have partial information.

6.4 Estonia

Summary:

Overall, the second programme of measures presented by Estonia is considered adequate to address the pressures acting on the Estonian marine environment and contributes to achieving Estonia's GES and targets.

In terms of strengths, Estonia has carried out a thorough cost environmental analysis on 26 new measures, which also takes into account short and long-term effects on socio-economic activities, marine environment and well-being. Additionally, Estonia reported the financing sources for each of the measures included in their second programme, at regional, national and EU levels. The new measures are strongly linked to other regional, national and European policies, strategies and legislation and international agreements.

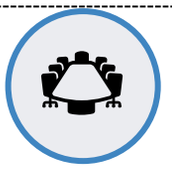
On the downside, there is no evidence on the quantitative benefit for achieving GES, especially in terms of social benefits or benefits for the most vulnerable groups. No details are given on how the implementation of the measures affect the green house emissions, or climate change, and how the measures interact at regional, national or European level.

Measures for litter, noise, biodiversity, NIS, commercial fish, seafloor integrity and hydrological changes are all considered adequate, whereas measures for eutrophication, contaminants and foodwebs are considered only moderately adequate and measures for contaminants in seafood are considered to be poor.

Based on the information reported in their programmes of measures, Estonia's commitment to the implementation of their second programme of measures has been assessed as "high"

The adequacy of Estonia's programme of measures for cross-cutting issues is considered **good**.

Estonia follows the MSFD reporting guidelines and provides the required information. However, some information was still missing, particularly regarding how social issues were considered, how views received from the public consultation process informed the finalisation of the second programme of measures, and how the programme of measures is linked to Estonia's and the EU's efforts on climate change.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	Estonia reported the financial costs of implementing measures, and these costs cover one-off investment costs and annual recurring costs. Estonia reports the results of a cost-effectiveness/multi-criteria analysis wherein they evaluated the measures against environmental and socio-economic considerations. Estonia quantitatively described the expected benefits from implementing the new measures in terms of improvements to the marine environment and positive impacts on society. Estonia considered the social impacts of the measures by examining which stakeholders and activities will be affected by individual measures as part of their evaluation on the socio-economic impacts and cost-effectiveness of measures.	Estonia reported carrying out a CBA, but there is no evidence on the quantitative/monetised benefits from achieving GES. There is no information to suggest that Estonia carried out further investigation on the social impacts of the measures in terms of social acceptability of the measure or impacts on groups that are vulnerable.
 **Interactions with climate change**	Estonia provided information to indicate that they considered the impacts of climate change on descriptors and their future state. Estonia stated that the need for new measures is also driven by climate change. The new measures are proposed not only to improve the state of the marine environment but to also ensure future benefits.	There is no information to suggest that they assessed how individual measures contribute or reduce GHG emissions. There is no information to suggest that Estonia considered how their second programme of measures is linked with regional, national, and European strategies on climate change.
 **Links to other policies**	Estonia reported the financing sources for each of the measures included in their second programme of measures, which include national and EU funding sources. Estonia stated that new measures proposed in the second programme of measures consider other regional, national and European policies, strategies and legislation and international agreements (WFD, the HBD , the MSP Directive, the Urban Waste Water Treatment Directive, the Industrial Emissions Directive, the Environmental Impact Assessment Directive, the Nitrates Directive, the Bathing Water Directive, the EU Strategy for the Baltic Sea, the EU Biodiversity Strategy, the CFP, and the EU Common Agricultural Policy).	Estonia does not report on the amount or proportion of funding from these national and EU sources. Estonia does not report changes to coordination mechanisms since their MSFD programme of measures.
	For each of the measures proposed in their second programme of measures, Estonia listed specific actions in the Baltic Sea Action	Estonia made no references to a change in mechanisms of cooperation, so it is not clear if there has been no change or if there has been a change but not reported.

Regional cooperation and transboundary impact	Plan 2021 that are linked with the implementation of the measure. Estonia undertook a Strategic Environmental Impact Assessment (SEA) which included the identification of transboundary impact of measures. They also consulted their draft second programme of measures and the SEA report with neighbouring countries.	
Public consultation and administrative process	Estonia provided information on the authorities responsible for implementing their second programme of measures. According to the RBMP assessment, public consultation and public discussions of the draft programme of measures was organised together with the draft RBMP.	Estonia does not provide information on what changes were made specifically from the feedback received. There was no information found on how Estonia will monitor the progress of implementation of measures. They did not provide information on changes to the implementation process and/or the administrative framework since the first cycle.

The adequacy of Estonia's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Estonia's programme of measures for D5 is considered moderate
Strengths		- Estonia has provided some information on progress achieving GES for D5 in its gap analysis, based on the Baltic Sea Action Plan targets for nutrient reduction. - Estonia has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses		- Estonia has provided some information on ten additional existing measures but has not quantified the extent to which these measures will reduce nutrient pressures. - There is no reference to updated WFD measures nor to Zero Pollution targets which are potentially relevant updated existing measures for D5. - The effect of updated existing measures and additional MSFD specific measures in reducing nutrient pressures has not been quantified. This quantification is in particular lacking as the assessment of Estonia's 3rd RBMP identified that the trends in dissolved inorganic nitrogen (and orthophosphate concentrations) in coastal and marine waters for the period 1980-2021 are increasing in Estonia and that eutrophication remains a large-scale problem in the Baltic Sea. - Given the limitations of the gap analysis it is not possible to determine the measures' contribution on achieving operational targets and GES. - The additional MSFD specific measures are partially linked to targets. - There remains uncertainty concerning whether funding of the measures has been secured.
Progress since 2016		- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures was partial - the modified and additional MSFD specific measures address relevant nutrient pressures but it is unclear whether the measures will be sufficient to achieve GES due to current limitations in the gap analysis.

	- In 2016, it is considered that the measures addressed the components of GES and targets. In 2022, the assessment considers that coverage of GES and targets was partial. While some of the measures were linked to operational targets, others were not.
D8-Contaminants	
Adequacy 	The adequacy of Estonia's programme of measures for D8 is considered **moderate**.
Strengths	- Estonia has provided some information on progress towards achieving GES for D8 in its gap analysis, based on the Baltic Sea Action Plan targets for reduction in contaminant pressures. - The additional MSFD specific measures are all linked to targets that were assessed as operational. - Estonia has provided most of the necessary information on where, when, and how the additional MSFD specific measures will be implemented
Weaknesses	- Estonia has not quantified to what extent these measures will reduce contaminant pressures. - Given the limitations of the gap analysis it is not possible to determine the measures' contribution on achieving operational targets and GES. It is of particularly relevance as, according to the assessment of Estonia's 3rd RBMP, none of the coastal waters are in good chemical status. - The effect of updated existing measures and additional MSFD specific measures in reducing contaminant pressures has not been quantified. - There is no reference to the National Emissions Ceiling Directive, the WFD or Zero Pollution targets which are potentially relevant updated existing measures for D8. - There remains uncertainty concerning whether funding of the measures has been secured.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures is partial – the additional MSFD specific measures address relevant contaminant pressures but it is unclear whether the measures will be sufficient to achieve GES due to current limitations in the gap analysis. - The 2016 Article 13 report considered that the measures partially addressed the components of GES and targets. The 2022 assessment considers that coverage of GES and targets was also partial.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Estonia's Programme of Measures is considered **poor**
Strengths	- The specific measures address some of the relevant pressures (reduction in contaminant inputs) from aquaculture, pharmaceuticals and blue economy development - Estonia has provided most of the necessary information on where, when, and how the additional MSFD specific measures will be implemented
Weaknesses	- Estonia has provided very little information in its gap analysis for D9 - The effect of additional MSFD specific measures in reducing contaminant pressures has not been quantified. - None of the measures address issues associated with dioxins and dioxin-like PCBs and only tangentially for cadmium. - The additional MSFD specific measures are not linked to targets that were assessed as operational. - There is no reference to updated existing measures under D8 which could be relevant to D9 or to the National Emissions Ceiling Directive, the WFD or Zero Pollution targets. - There remains uncertainty concerning whether funding for the measures has been secured
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures was partial. - The 2016 report considered that the measures partially addressed the components of GES and targets. In 2022, the assessment considers that additional MSFD specific measures in

	the second cycle did not contribute to meeting the operational environmental targets (and ultimately GES).
D10 — Marine litter	
Adequacy 	The adequacy of Estonia's programme of measures for D10 is considered very good
Strengths	- The gap analysis provided by Estonia is considered adequate and provide sufficient information. - Information is provided on the MSFD results of monitoring and/or studies on trends in relation to the different D10 criteria as well as on the socio-economic forecast of the relevant pressures, and on the justification for the implementation of new measures. - All relevant details on where, how and when the additional MSFD specific measures will be implemented and how implementation supports the achievement of GES. - The additional MSFD specific measures that are specifically addressing D10 are all linked to one or both operational targets defined by Estonia. - Reference is made to relevant policy frameworks and decisions such as HELCOM initiatives and the SUP Directive.
Weaknesses	- It is not clear how the additional existing measures will contribute to achievement of GES, particularly for D10. - The references to Zero Pollution targets and EU beach litter thresholds are not mentioned in Estonia's report.
Progress since 2016	- The adequacy score of Estonia's report on D10 in the second programme of measures has improved compared to the 2016 assessment. - The coverage of pressures for D10 Marine Litter was considered to be addressed in 2016, with measures addressing the reported pressures and activities. Similarly, the 2022 assessment of the second programme of measures also concludes that measures cover the relevant pressures. - In the 2016 assessment, it was considered that the measures only partially addressed the GES components and targets. The 2022 assessment concludes that all relevant targets are addressed.
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Estonia's programme of measures for D11 is considered good
Strengths	- Estonia has reported one modified existing measure aimed at creating an impulsive sound register as recommended by TG Noise. While the noise register does not constitute a measure by itself, it is an essential input to define measures to target impulsive underwater noise. - The active contribution of Estonia to HELCOM activities indicates that Estonia is addressing the significant gaps at regional level, which will possibly help to achieve the impulsive and continuous noise targets and ultimately GES. - Estonia's report presents all relevant details on where, how and when this measure will be implemented and how implementation supports the achievement of GES. - One measure is aimed at directly preventing further inputs of a pressure and is considered adequate to address both continuous and impulsive noise. This measure ensures that the management of underwater noise will be at the state-of-the-art practices in the entire Baltic Sea, and consistent with the other Member States of the region.
Weaknesses	- The gap analysis provided by Estonia is considered partially adequate as it does not cover all the aspects defined in the guidance document. - The measure which aimed at directly preventing further inputs of a pressure is not linked to D11- specific environmental targets.
Progress since 2016	- The adequacy score of Estonia's report on D11 in the second programme of measures remained the same as in 2016. - The coverage of pressures for D11 underwater noise was to be addressed in 2016. Estonia has strengthened its approach towards tackling underwater noise.

	- In the 2016 assessment, it was considered that the measures only partially addressed the GES components. As for targets, in 2016 there were uncertainties regarding the ability of the measures to cover all elements of the targets' definitions. Estonia has made a step back in the definition of targets as there are no D11-specific targets reported under Article 10 anymore. It is therefore impossible to judge whether the measures will contribute to achieving the targets and ultimately GES.

The adequacy of Estonia's programme of measures to address **biodiversity** issues is considered **good.**

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Estonia's programme of measures for D1 is considered very good
Strengths	- The gap analysis reported by the Member State clearly outlines the current status of each of the species' groups and the habitat under descriptor 1 and whether they are currently at GES. - The pressures can be clearly linked to the new measures introduced in the 2021 programme of measures, demonstrating that the Member State has used the gap analysis as a tool for designing new and effective measures. - The baseline scenario is also summarised, stating that with no further action pressures will continue to rise, having a negative impact on biodiversity. - All new measures reported in the programme of measures address relevant pressures (especially those identified in the gap analysis as still problematic) and contribute to all relevant environmental targets under descriptor 1. - Where, when and how the measures will be implemented is reported in a partially adequate manner. - The single new updated spatial protection measure also addresses the relevant pressures indirectly through reviewing and improving the effectiveness of Estonian MPAs.
Weaknesses	- Socio-economic developments and their impacts on measure effectiveness are not discussed. - Some information is missing such as action modes and some information requiring further details, for example the timelines of implementation steps within each measure.
Progress since 2016	- In 2016, the assessment determined that pressures and environmental targets were partially covered by the measures. Progress has therefore been made since 2016, with measures now implemented to reduce bycatch of vulnerable species. - Targets related to fish are not entirely addressed by the measures. - For pelagic habitat, progress has not been made since the 2016 assessment, as nutrient input from land-based activities is not addressed by any of the measures reported under descriptor 1 in the programme of measures.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Estonia's programme of measures for D2 is considered very good
Strengths	- Estonia has provided a detailed gap analysis which includes the current state of introductions, assessment concluding that GES has not been achieved for D2, the current progress and limitations of the 2015 measures, and has identified where future measures are needed. - Estonia acknowledges the importance of the international implementation of the measures relating to shipping and aquaculture in the Baltic to mitigate the spread of NIS. - The measures adequately address the pressures relating to D2 both directly and indirectly and Estonia also addresses gaps relating to hull fouling and aquaculture. - The additional MSFD specific measures only address Estonia's operational environmental target of reducing NIS introductions to zero.

	- Adequate details are provided on where, how and when the additional MSFD specific measures will be implemented.
Weaknesses	- The future threat of NIS introduction posed by the future potential development of aquaculture in European seas is not addressed in the programme of measures. - Clarity on which environmental targets the measures address is not provided in the reporting.
Progress since 2016	- Estonia has progressed on developing adequate measures. In 2016, the measures were assessed only partially to address the pressures relating to D2. - In the 2022 programme of measures, the additional MSFD specific measures address hull cleaning and the implementation of minimum requirements for EIAs to address the management and monitoring of NIS in maritime developments. - In 2016, the measures only partially addressed the targets and ultimately partially contributed to achieving GES. The 2022 programme of measures with additional MSFD specific measures are directly addressing the introduction of NIS by implementing actions to limit their introductions from shipping and maritime developments.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Estonia's programme of measures for D3 is considered good
Strengths	- Estonia identified the need for new measures to reduce fishing effort and improve the possibilities for restocking fish populations. - All relevant pressures are addressed by the additional MSFD specific measures. - All measures are linked to environmental targets and are well detailed in the reporting. - Estonia explains where, how, and when measures will be implemented.
Weaknesses	- Estonia has partially identified all significant gaps to achieve GES. The main obstacles to GES are excessive fishing, environmental obstacles and limited reproduction rate.
Progress since 2016	- In 2016, Estonia's measures were considered to partially address the reported pressures and activities. There has not been progress on addressing recreational fishing through the new measures. - In 2016 it was considered that the measures address the D3 GES and targets. In 2022, the relevant measures remain in place and the additional MSFD specific measures should further contribute to progress towards GES.
D4 — Foodwebs	
Adequacy 	The adequacy of Estonia's programme of measures for D4 is considered moderate.
Strengths	- The gap analysis provided by the Member State covers well the current status of food web health. - Estonia addresses all relevant environmental targets with the new measures as there are many overlaps with those of descriptor 1. - A measure is taken to reduce the number of fishing licenses awarded in Estonian waters
Weaknesses	- Estonia does not identify pressures specific to descriptor 4, which continues to prevent progress towards GES. - Estonia does not clearly explain how and where the new measures are needed and where current measures are failing. - New additional and updated measures do not cover all of the pressures identified for food web health. - Timelines not only for the implementation of the measure but the implementation steps within each measure are not provided.
Progress since 2016	- In 2016, the assessment determined that measures only partially addressed both targets and pressures under descriptor 4. - Limited progress has been made since 2016. Targets remain generally addressed by the high-level measures applied to marine mammals, however more direct measures are required.

	- There remain no measures under descriptor 4 for Atlantic Salmon and Perch. For real progress to be seen, more species-level measures are required, especially for the species selected as indicators of food web health.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Estonia's programme of measures for D6 is considered good
Strengths	- The gap analysis provided by the Member State is adequate, providing clear and detailed reporting on the current status of seabed integrity in Estonian waters, which currently meets GES, as well as the pressures which could cause this status to be lost. - There are clear links between the pressures around the projected increase in human activity and the use of marine resources and the new measures introduced in the 2021 programme of measures. - Planning for the compensation of any negative impacts of sustainable marine energy development, which is projected to expand rapidly in Estonian waters, is a good step towards maintaining seabed health
Weaknesses	- Several new measures do not directly address relevant pressures and targets as their focus is not on the physical integrity of the seabed. - More direct measures which remove physical pressures and would ensure the safety of the GES of seabed habitats are not provided. - The reporting of where, when and how the new measures will be implemented is provided but not in detail.
Progress since 2016	- In 2016, the assessment determined that descriptor 6 pressures were not addressed by the measures, and targets were partially addressed. - Progress has been made since 2016, with pressures which were not addressed in the first cycle of the programme of measures now addressed by new and updated measures. - With regards to targets, measures have been introduced to reduce pressures.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Estonia's programme of measures for D7 is considered very good
Strengths	- Estonia defines two operational targets that will guide progress towards ultimately achieving GES. - Estonia's 2023 report shows a very complete assessment of all relevant pressures from existing and future activities that are likely to permanently alter hydrographical conditions. - The gap analysis provided sufficient justifications for the modified and additional MSFD specific measures in the second cycle. - Measures are adequately linked to Estonia's programme of measures under WFD, to other directives and legislations and actions carried out in the framework of HELCOM.
Weaknesses	- The measures are not clearly linked to the environmental targets: the report does not indicate which way and to what extent these actions will contribute to achieving the environmental targets.
Progress since 2016	- Estonia's adequacy score for its report on its programme of measures for D7 has improved since 2016.

Based on the information reported in their programme of measures, Estonia's commitment to the implementation of their second programme of measures is assessed as '**high**'.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD

			measures: where, how and when
CEA on 26 new measures, and benefits analysis covered qualitative expected benefits, but did not provide information on how this influenced measure selection. Examined short-term and long-term impacts on activities and well-being.	Named national (e.g. funds from different Ministries), local (e.g. municipality funds) and EU (e.g. EMFAF, ERDF) funding sources to support implementation of programme of measures. Highlighted that EMFAF is only a potential source of funding and no amounts have been allocated to specific measures.	New measures considered other European, regional and national policies, strategies and legislation and international agreements, including the WFD, MSP, CFP and HBD. Authorities responsible for implementing measures were identified. Regional cooperation is via HELCOM, and relevant actions in the Baltic Sea Action Plan 2021 have been linked with the second Programme of Measures. There is a cross-cutting measure to ensure international and regional cooperation for the protection of the marine environment given existing cooperation frameworks.	Where: Measures for ten Descriptors have sufficient details on spatial coverage; and measures for one (D9) have partial information. How: Measures for five Descriptors (D2, D3, D7, D10, D11) with sufficient details, e.g. the Ministry of the Environment of Estonia is the responsible authority for implementation of measures for D2. Measures for six Descriptors (D1, D4, D5, D6, D8, D9) have partial information. When: Measures for eight Descriptors (D2, D3, D5, D7, D8, D9, D10, D11) have sufficient details on temporal scope. Three (D1, D4, D6) with partial details.

6.5 Spain

Summary:

Overall, the second programme of measures presented by Spain is considered to be moderately adequate to address the pressures acting on the Spanish marine environment and partially contributes to achieving Spain's GES and targets.

In terms of strengths, Spain carried out CBA/CEA for all new measures, targeting all descriptors. Spain is actively participating in coordination and implementation at regional level (Barcelona Convention and OSPAR) and at EU level (through the CIS). Spain's updated programme of measures report is quite complete. It gives a comprehensive overview of the required information: measures and their characteristics, detailed measure factsheets, gap analysis and significant progress on spatial protection measures (12 new measures). Spain presents a stronger programme of measures for biodiversity issues than for pollution issues.

On the downside, there is a lack of detailed information on the cost and benefit categories assessed, and no consideration of the social issues. There is a lack of clarity over the gap analyses for D1, D4 and D7 (although overall adequacy assessment for those descriptors is good), or only qualitative analyses (D8, D9), and only partial justification for withdrawal of certain measures (D4 and D6). Measures for commercial fish, invasive species, eutrophication, contaminants in seafood and litter have been considered as only moderately adequate to address the relevant pressures.

Based on the information reported in their programmes of measures, Spain's commitment to implementing their second programmes of measures has been assessed as 'high'.

The adequacy of Spain's programme of measures for **cross-cutting issues** is considered **poor**.

Spain's updated programmes of measures did not have major changes since the first cycle in terms of methods applied for measures selection, of regional and international cooperation, and of public consultation.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	All new measures were subjected to an economic assessment including a Cost-Benefit Analysis and Cost-Effectiveness Analysis which helped in prioritizing measures. The economic assessment methodology was well-explained	Spain failed to provide detailed information on the costs and benefits categories assessed. It only provided general estimations which makes it difficult to understand what cost categories and benefits were assessed and considered. Spain did not present any indication of social issues considered, and a social assessment was not carried out to support the development of the Programmes of measures
 **Interactions with climate change**	Some of the measures (existing and new) outlined in Spain's programmes of measures included initiatives concerned with climate change adaptation, and increased knowledge of climate change effects on ecosystem services, and socio-economic activities.	The programmes of measures did not elaborate on how the updated programmes of measures took into account climate change considerations (although Spain is the country with the largest number of measures that can be categorised as 'climate change measures' – see Section 3.3).
 **Links to other policies**	The programme of measure refers to the links between the MSFD and other EU policies (WFD, MSP, CFP, BHD). Spain presented various financing sources for the implementation of the programmes of measures	Coordination mechanisms and interactions between the MSFD and other policies were only provided for the WFD and not for other EU policies. This lack of information makes it challenging to understand how coordination was done, the potential synergies, and the outcomes of such cooperation with other EU policies. Spain did not provide specific details on the sources of funds and the amounts mobilized from each source. This information could have given additional insights into the priorities and targeted sectors/descriptors.
 **Regional cooperation and transboundary impact**	The coordination between Spain and neighbouring countries was carried out at European and regional levels.	While the regional coordination was well explained, Spain did not provide any information on assessing the transboundary impacts of measures. The reference to exchange of information and collaboration at different levels is not explicit, and it is not clear whether neighbouring countries have been informed on the transboundary impacts during these information exchanges/meetings.
	Several workshops, and bilateral meetings with civil society, stakeholders, and competent authorities were held to discuss the new measures to put in place. This was followed by an online public consultation. All the collected	The report does not mention to what extent the programmes of measures was modified to incorporate the outcome of the public consultation.

Public consultation and administrative process	views were taken into account in the final programmes of measures. Spain provided information on the implementation of programmes of measures and on the authorities in charge of coordinating and implementing the measures. The RBPM assessment highlighted that there does not seem to have been a fully coordinated development of the planning tools of the WFD and MSFD, nor concurrent or jointly organised public participation processes.	No information was provided on the evolution of the implementation process since the first cycle. Even if a no-evolution would have occurred, this was not made explicit in the text.

The adequacy of Spain's programme of measures to address pollution issues is considered **moderate.**

Pollution

D5- Eutrophication	
Adequacy 	The adequacy of Spain's programme of measures for D5 is considered moderate.
Strengths	- Spain has undertaken a gap analysis to identify where additional measures might be required to address pressures. - The reporting identifies updated RBMPs as updated measures and also references the continuing work of the OSPAR and Barcelona Conventions. - The gaps identified are addressed with the definition of additional measures targeting port activities. - Spain has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented in the e-reporting.
Weaknesses	- There is no reference to updates to the National Emissions Ceiling Directive. - The gap analysis appears to be qualitative. It is unclear whether the MSFD specific measures that form part of the second cycle will be sufficient to achieve GES. There is a lack of detailed information from the gap analysis concerning the significant pressures and no quantification of the contribution of the MSFD specific measures to addressing the significant pressures. - Because of the lack of quantification of the gaps, it is unclear whether the measures will be sufficient to achieve GES. - There remains some uncertainty concerning the funding of some of the measures.
Progress since 2016	- In 2016 pressures were considered to be partially covered. Similarly, the 2022 assessment also considers that coverage of pressures is partial. - In 2016, measures were considered to address the components of GES and targets. In 2022 measures are considered to partially cover the components of GES and targets, which suggests lack of progress.
D8-Contaminants	
Adequacy 	The adequacy of Spain's programme of measures for D8 is considered good.
Strengths	- Spain has undertaken a gap analysis to identify where additional measures might be required to address pressure. - The report identifies updated RBMPs as updated measures and also references the continuing work of the OSPAR and Barcelona Conventions. - Spain has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented in the e-reporting. - The programme of measures is considered to address the reported pressures and activities in all Spanish marine subdivisions. The programme of measures also targets additional activities such as dredging, fishing or tourism.

	- The modified and additional MSFD specific measures are considered to be partially linked to operational targets.
Weaknesses	- There is no reference to Zero Pollution targets or references to updates to the National Emissions Ceiling Directive. - The gap analysis appears to be qualitative. It is unclear whether the modified and additional MSFD specific measures that form part of the second cycle will be sufficient to achieve GES. - There remains some uncertainty concerning the funding of some of the measures, for example confidence was assessed by ES as 'low' in terms of obtaining funding for one measure and 'moderate' for most others.
Progress since 2016	- In 2016, it was considered that the Programmes of measures addressed pressures well. In 2022 coverage of relevant pressures is not clear as there is a lack of detailed information from the gap analysis concerning the significant pressures and no quantification of the contribution of the MSFD specific measures to addressing the significant pressures. - In 2016 the measures were considered to address the components of GES and targets. In 2022 the measures were assessed to address only partially the components of GES and targets, pointing to a certain deterioration.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Spain's programme of measures for D9 is considered moderate.
Strengths	- Spain has undertaken a gap analysis to identify where additional measures might be required to address pressures. - The report identifies where updates to RBMPs are relevant to D9. - Spain has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented. - Some of the modified and additional MSFD specific measures relevant to D8 will also be relevant to D9 where they reduce inputs of relevant contaminants. - The programme of measures is considered to address the reported pressures and activities in all Spanish marine subdivisions. The programme of measures also targets additional activities such as dredging, fishing or tourism.
Weaknesses	- The justification for withdrawing one measure on handling bulk liquids in port is considered inadequate. - The gap analysis appears to be qualitative. It is unclear whether the MSFD specific measures that form part of the second cycle will be sufficient to achieve GES. There is a lack of details provided in the gap analysis and some discrepancies in the environmental targets reported under Article 10 and Article 13. - All of the modified new measures and 13 of the additional MSFD specific measures are cross-cutting and likely to make only a very minor contribution to achieving GES for D9. - Given the total number of measures in the ES programmes of measures for contaminants (D8) and the single D9 specific measure reported by the Member State, it is considered that more explicit references could have been made about contamination in species intended for human consumption. - There remains some uncertainty concerning the funding of some of the measures.
Progress since 2016	- In 2016, it was considered that the programmes of measures covered the relevant pressures. In 2022 the coverage of pressures is not clear as there is a lack of detailed information from the gap analysis concerning the significant pressures and no quantification of the contribution of the modified and additional MSFD specific measures to addressing the significant pressures. - In 2016 it was considered that the measures addressed the components of GES and targets. In 2022 the measures do not cover targets as they are considered not operational.
D10 — Marine litter	
Adequacy 	The adequacy of Spain's programme of for D10 is considered moderate.
Strengths	- The gap analysis provides an overview of the priority lines relevant to D10 where new measures should focus on.

	- Spain has modified some existing measures, or identified additional ones in order to incorporate recent EU- or regional level policy updates and ES refers to important recent EU-level and regional developments such as those within OSPAR (guidelines) and Directive (EU) 2019/904. - Adequate justification is provided when relevant measure is withdrawn. - Spain has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented
Weaknesses	- Spain programmes of measures lacks a quantitative gap analysis of the contribution of measures towards GES, which makes it difficult to assess whether the measures will be sufficient to achieve GES for D10. - It is not clear from the reporting whether the combined set of modified and additional MSFD specific measures will be able to achieve GES. - The modified and additional MSFD specific measures are considered to be partially linked to operational targets. - Aquaculture in the Bay of Biscay is not specifically addressed by any of the new measures.
Progress since 2016	- In 2016, it was considered that the programmes of measures covered the relevant pressures. The lack of detailed gap analysis on which were exactly the gaps to achieve MSFD targets and GES hampers clear conclusions on the coverage of pressures in the 2022 assessment. - In 2016, Spain did not report clear timelines for reaching GES. While the 2022 assessment concludes that timelines for measures of the second programme of measures are clear, it is not specifically mentioned whether Spain will have reached GES by 2030
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Spain's programme of measures for D11 is considered good.
Strengths	- Spain has updated existing measures and created additional ones in line with recent policy developments and research projects recently started. - Recent developments within OSPAR are considered, including recommendations and guidelines specific to underwater noise. - Spain identifies where the additional MSFD specific measures will be implemented, specifying the relevant (sub)region and marine reporting unit for each measure, and whether the measure applies in coastal waters, territorial waters, transitional waters, and/or the EEZ. - Spain has explained how the additional MSFD specific measures will be implemented, providing a description of how the measure will be implemented, details on relevant policies, on lead competent authorities and on financing. - Two of the new measures focus on the gathering of data, indirectly affecting underwater noise instead of actively reducing the pressures. - Demonstration projects proposed in the form of defining intensity thresholds are promising and a step in the right direction. - One measure also relevant to D1 refers to the protection (prevention and mitigation) of marine mammals against the risk of collisions and the impacts of ambient noise.
Weaknesses	- It is not clear whether Spain has adequately identified all significant gaps to achieve MSFD targets and GES. Spain has not estimated when GES is expected to be achieved. - The gap analysis does not contain elements expected such as a baseline scenario, consideration of how much current measures will reduce pressures, future socio-economic developments, or an indication of the timeline for when GES will be achieved. - The work of *TG Noise* in setting up threshold values for D11 criteria is not mentioned, although Spain is making efforts toward the definition of threshold values as demonstrated by the additional MSFD specific measures defined. - Spain does not address any other anthropogenic input source such as heat/light.
Progress since 2016	- Spain has made some progress in the updated programmes of measures by establishing new measures that are relevant for D11. - In 2022, as in 2016, Spain has only partially addressed the pressures and activities. The gaps identified in 2016 are addressed by one measure set up to mitigate underwater noise. This includes setting intensity thresholds, enforcing measures to reduce the emission of underwater noise, implementing innovation techniques for underwater noise monitoring, and implementing

	awareness measures. However, two of the four additional measures focus on the gathering of data, indirectly affecting underwater noise instead of actively reducing the pressures.

The adequacy of Spain's programme of measures to address **biodiversity** issues is considered **good**.

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Spain's programme of measures for D1 is considered good.
Strengths	- The modified and the additional MSFD specific measures in the second programme of measures address all relevant pressures. - Spain reports 28 'direct' measures for D1 although a majority are considered addressing pressures only indirectly. - 'Direct' measures reported include the designation of protected areas, the regeneration of habitats, the reduction of disturbance from human activities, and the reduction of incidental species extraction through bycatch. These measures directly address pressures such as species disturbance and species extraction, both of which pose a significant threat to local biodiversity. - It is considered that Spain has explained where and how the additional MSFD specific measures will be implemented. - Measure descriptions are provided, links to international and national policies are provided, responsible authorities and organisations are identified and the level at which co-ordination is required is specified. - The additional MSFD specific measures relating to MPAs adequately address relevant pressures.
Weaknesses	- There is only a partial explanation of how the updates to the existing measures from the first cycle contribute to achieving GES. - There is a lack of clarity over the gap analysis (e.g. no information is presented regarding the current conservation status of habitats or species and the effectiveness of first cycle measures is not assessed), meaning that the gaps identified are not entirely reliable. - Spain only provides partial justification for the withdrawal of two measures relevant to D1-biodiversity. - A number of measures are studies, or measures with the explicit aim of improvement of knowledge. Whilst essential for the long-term health of marine biodiversity, knowledge acquisition measures do not have immediate direct impacts on the relevant pressures. - There is insufficient emphasis on the water column habitats.
Progress since 2016	- Overall, progress made in the programmes of measures is limited as the assessment for the 2016 report is generally the same. - Spain was assessed as addressing pressures in all species groups in 2016, though pressures on water column habitats were only partially adequately described. While the same result is seen in the current programmes of measures, there is perhaps still a focus on pressures relating to species, with less on pelagic habitats. - Regarding the coverage of GES and targets in 2016, it is considered that Spain addresses again GES and targets for all species groups, with a strong emphasis on bycatch and the regulation of human activities.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Spain's programme of measures for D2 is considered moderate.
Strengths	- There is overall good coverage of the pressures relating to D2 by the new measures. - Relevant targets for each new measure are reported and the new measures are considered to contribute to the targets.

	- Adequate detail on where, how and when the new measures will be implemented was provided.
Weaknesses	- It is not clear which of these measures are modified or new measures. It is also unclear how these measures will contribute to achieving GES for D2. Spain states that a gap analysis has been undertaken; however, it is not clear what gaps are identified for D2 as no baseline is provided nor any progress from the first cycle measures. - It is unclear the status of NIS introduction and impact in Spanish waters under D2C2 and D2C3 - More detail should be provided on the relevance of some of the cross-cutting measures to D2.
Progress since 2016	- The 2016 assessment considered that coverage of pressures had been partially addressed. In the 2022 assessment, the coverage of pressures is also considered partially adequate. - The 2016 assessment considered that the measures addressed the components of GES and targets. The new measures also address the targets which were considered adequate for the achievement of GES in the Article 10 assessment.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Spain's programme of measures for D3 is considered moderate.
Strengths	- Spain identifies where the additional MSFD specific measures will be implemented, specifying the relevant (sub)region and marine reporting unit for each measure, and whether the measure applies. - Spain has explained how the additional MSFD specific measures will be implemented, providing a description of how the measure will be implemented, details on relevant policies, lead competent authorities, and financing. - Implementation timeline of the additional MSFD specific measures has been stated.
Weaknesses	- Spain only partially explains how the updates to existing measures contribute to achieving GES. - It is not clear whether Spain has adequately identified all significant gaps to achieve MSFD targets and GES. - The gap analysis does not contain the elements expected of a gap analysis, such as a baseline scenario, consideration of how much current measures will reduce pressures, future socio-economic developments, or an indication of the timeline for when GES will be achieved. - The justification provided for withdrawing new measures from the first cycle is only partially adequate. - It is unclear if the additional measures will contribute to meeting operational environmental targets. This is partly because it is not clear whether the targets they are linked to are relevant or operational, but also several of the measures promote increased monitoring which will not in itself reduce pressures. - Given the state of fisheries resources in the Mediterranean, it is considered not clear whether the management measures proposed represent a sufficient departure from the status quo to address the problem.
Progress since 2016	- In 2016, Spain's programme of measures report was considered to partially address relevant pressures from commercial and recreational fisheries as well as seaweed harvesting in all Spanish subdivisions, except the Western Mediterranean ones. In 2022, the programme of measures is still considered to partially address relevant pressures as the gap in the Mediterranean subregion was not addressed by the additional measures.
D4 — Foodwebs	
Adequacy 	The adequacy of Spain's programme of measures for D4 is considered good.
Strengths	- The modified and the additional MSFD specific measures in the second programme of measures address all relevant pressures. - As measures get more specific in their actions, the list of relevant pressures becomes more focussed.

	- ES has indicated four measures as relevant only to D4, three are fisheries management measures, aimed at reducing pressures related to the extraction of biological species, the other one relates to seabed habitat restoration and is also relevant to D6. - All measures are linked to operational targets. - Spain has explained where and how the modified and additional MSFD specific measures will be implemented. Measure descriptions are provided, links to international and national policies are provided, responsible authorities and organisations are identified and the level at which co-ordination is required is specified. - It is considered that the modified and additional MSFD specific measures relating to MPAs adequately address relevant pressures.
Weaknesses	- There is only a partial explanation of how the updates to the existing measures from the first cycle contribute to achieving GES. - There is a lack of clarity over the gap analysis. No information is presented regarding the current environmental status of food web stability. The effectiveness of individual measures is not assessed. - ES only provides partial justification for the withdrawal of one measure relevant to D4-food webs. - Few measures can be considered as specific to food webs, and only one, relating to application of the discard regulations, can be seen as directly impacting a relevant pressure. While the overarching D1 biodiversity measures are relevant, there are opportunities for expanding the number of measures specific to D4 food webs. - Spain has only partially explained when modified and additional MSFD specific measures will be implemented.
Progress since 2016	- The adequacy of Spain's report under Art.16 for D4 is considered 'Good'. This is the same as the assessment for the 2016 report. - Regarding the coverage of pressures, Spain was assessed as addressing pressures on food webs in 2016, based on analysis of fish, cephalopods, mammals, and reptiles. The same conclusion was reached in assessing the current programmes of measures. - Regarding the coverage of GES and targets in 2016, again it was considered that Spain addressed GES and targets, based on analysis of fish, cephalopods, mammals, and reptiles, with a strong emphasis on bycatch and the regulation of human activities. The same conclusions are reached for the current programmes of measures.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Spain's programme of measures for D6 is considered good.
Strengths	- The additional MSFD specific measures in the second programme of measures address all relevant pressures. - Details of relevant pressures are provided for each measure. - In addition to broad measures which may have a positive impact on pressures, such as development of MPA management plans, a number of measures are more focussed on D6 and directly address damage and disturbance to seabed habitats (e.g. closing areas to demersal fishing, management of anchorages, habitat restoration projects). - It is considered that Spain has explained where and how the modified and additional MSFD specific measures will be implemented. While the reported spatial scope of most of the measures is appropriate. - It is considered that the modified and additional MSFD specific measures relating to MPAs adequately address relevant pressures.
Weaknesses	- There is only a partial explanation of how the updates to the existing measures from the first cycle contribute to achieving GES. - There is a lack of clarity over the gap analysis. No information is presented regarding the current conservation status of habitats or species. Similarly, the effectiveness of individual measures is not assessed. - Progress towards GES is only reported in terms of whether, and how well, environmental objectives are being met.

	- Spain does not provide adequate justification for the withdrawal of two measures relevant to D6-seabed. - Spain has only partially explained when modified and additional MSFD specific measures will be implemented. - There is a gap in linking the modified and additional MSFD specific measures relating to MPAs to the management of specific activities such as fishing and aggregate extraction.
Progress since 2016	- Regarding the coverage of pressures in 2016, Spain was assessed as only partially addressing pressures relating to physical loss and damage. The current programme of measures is considered to adequately address all pressures. - Regarding the coverage of GES and targets in 2016, it was considered that Spain addressed GES and targets for seabed habitats, though this was despite GES not begin defined for seabed habits in North and South Atlantic subdivision or Macaronesia. There is a good coverage of relevant targets in the current programmes of measures.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Spain's programme of measures for D7 is considered good.
Strengths	- Spain presents the methodology used to assess the efficiency of existing and new measures from the first cycle, identify gaps, define priorities for the second cycle and select relevant actions (withdraw existing measures from first cycle, modify them, or implement additional MSFD specific measures) - The second cycle is structured according to the progress against the achievement of environmental targets. - Spain partially explains how the updates to existing measures contribute to achieving GES.
Weaknesses	- For D7, several limitations are identified: lack of knowledge of status of waters against GES, lack of monitoring and reporting, environmental targets too broad or not operational enough, and lack of clear description of the reference scenario for future human activities that should provide the baseline for identifying pressures to be addressed by the programmes of measures. - It is not easy to establish the specific link between the measures of the updated programmes of measures and D7, and their expected contribution to progress towards ultimately achieving GES for D7. - Potentially important pressures linked to future activities (such as the planned development of offshore windfarms) that should affect hydrographical conditions are not addressed under D7. - No clear measure about desalination in the Mediterranean Sea was reported. - Cumulative impacts were explicitly referenced, and it was not clear how or if they are addressed. - It is difficult to assess if the second programme of measures will contribute to achieving the environmental targets or to progress towards GES for D7, and to which extent.
Progress since 2016	- No additional progress has been observed in Spain's report on D7 in the second programme of measures.

Based on the information reported in their programmes of measures, Spain's commitment to the implementation of their second programme of measures is assessed as 'high'.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when

An impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA) is undertaken. This helped in measure prioritisation. However, no information on social impacts of measures is provided.	Spain's report presents general information on the funding sources without specifying exact sources. No information on which EU funds will be mobilised.	Spain's report highlights the links between the MSFD and the CFP, WFD, MSP and HBD in terms of objectives and measures. It names the relevant national and regional groups that ensure coordination between the WFD and MSFD. Reported cooperation via MSFD and regional sea conventions (i.e. OSPAR, UNEP-MAP) working groups, and the purpose and outcomes of cooperation.	Measures for all Descriptors have sufficient details on spatial coverage. For example, all measures for D4 are applicable to the Western Mediterranean Sea, the Bay of Biscay and the Iberian Coast, and Macaronesia. Measures for all but one Descriptor (i.e. D10) have sufficient details on operationalisation. Measures for eight Descriptors (D2, D3, D4, D5, D7, D8, D9, D10, D11) have sufficient details on the temporal scope, and measures for three Descriptors (D1, D4, D6) only have partial information.

6.6 Finland

Summary:

Overall, the second programme of measures presented by Finland is considered to be adequate to address the pressures acting on the Finnish marine environment and contributes to achieving Finland's GES and targets.

In terms of strengths, Finland has done very strong gap analyses for a number of topics, in particular eutrophication, contaminants and biodiversity, and assessed the extent to which GES is achieved with existing measures and what additional measures are needed. Finland also carried out CBA/CEA for all new measures. Finland also presented what it has done in terms of regional cooperation for each measure for almost all topics (except non-indigenous species and hydrographical conditions). Details are provided on coordination between the MSFD and the WFD in terms of measures' objectives, coordination and implementation. It is explained that the measures targeting the River Basin Management Plan (RBMP) are essential to reach GES. It should be noted that Finland's 3rd RBMP under the WFD concludes that there has been a decrease in the area of coastal waters in good status (from 27% to less than 15%), signalling a deterioration, which may be due to improved monitoring. Therefore, Finland should ensure that the appropriate measure are taken and implemented to achieve the objective of both WFD and MSFD.

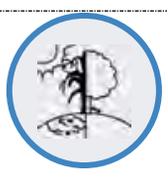
On the downside, measures for contaminants in seafood and non-indigenous species are considered only moderately adequate to cover relevant pressures. No information is provided on the amounts foreseen for each source of fundings.

Based on the information reported in their programmes of measures, Finland's commitment to implement their second of programme of measures has been assessed as 'high'.

The adequacy of Finland's programme of measures for **cross-cutting issues** is considered **good**.

The update of the programme of measures has not experienced major changes since the first cycle in terms of methods applied for measures selection, reported links between the MSFD and other policies, regional and/or international cooperation, and public consultation. Finland respected the reporting guidelines and reported all the needed information. Nevertheless, clarifications, allowing better

understanding, are still needed for different sections of the cross-cutting, such as economic analysis, climate change considerations, public consultation, etc.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	Measures selection was done by undertaking a CEA and CBA. Finland provided information on the different cost categories considered and benefits assessed for improving/achieving GES. Social assessment of potential social impacts of measures was provided in the programme of measures.	For some measures, the reason for not undertaking the CBA and CEA is not provided. The methodology followed, the outcomes of CEA and CBA and how they influence the selection of measures are not presented in the programme of measures. Uncertainty still exists in the social assessment methodology and results as they are not reported in the programme of measures.
 **Interactions with climate change**	The impact of climate change on the marine environment, notably on ecosystem services has been presented by Finland. The programme of measures mentions for each measure (when relevant), the potential reduction in GHG.	Uncertainty still exists on i) the role of new measures in enhancing the adaptive capacity to climate change, ii) the role of new measures in the climate change adaptation strategy, and iii) the effects of new measures in preserving ecosystem services and socio-economic activities.
 **Links to other policies**	The link between MSFD and WFD is made and the coordination between both directives is done at the ministerial level. The programme of measures clearly states that measures considered in the River Basin Management Plan (RBMP) are important for marine management and essential to reaching GES. Finland presents the coordination done between the MSFD and many other EU legislations/policies such as the BHD, MSP, CFP, EU Biodiversity Strategy, EU REACH Directive, Flood Directive, Nitrates Directive, Single Use Plastic Directive, and Urban Wastewater Treatment Directive.	Uncertainty still exists on the mechanisms and outcomes of coordination between the MSFD and the mentioned directives. Finland does not provide additional information on the amounts mobilised from each source making it difficult to better understand priorities and the targeted sectors and descriptors.
 **Regional cooperation and transboundary impact**	On the regional level, cooperation is taking place through HELCOM, namely through the HELCOM GEAR Working Group. Finland participated in elaborating on the Baltic Sea Action. On the EU level, Finland coordinates with other EU Member States through the Marine Strategy Coordination Group and its working group POMESA which updated the recommendation on the operational programme. Transboundary impacts of the proposed measures are addressed in the programme of	It is unclear if Finland communicates with neighbouring countries on the transboundary impacts.

	measures and are assessed for different descriptors.	
Public consultation and administrative process	Feedback from public consultation has been considered in the finalisation of the programme of measures. Finland provides a clear indication of the responsible authority for the MSFD implementation and coordination at different levels.	Unlike in all its RBMPs, the MSFD programme of measures does not include a summary of the changes made after the consultation.

The adequacy of Finlands's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5- Eutrophication	
Adequacy	The adequacy of Finland's programme of measures for D5 is considered very good
Strengths	- Eutrophication pressures and relevant measures are well understood. - Measures have been identified to address the key pressures contributing to eutrophication. It is consistent with Finland's reporting under the WFD where, for some RBMPs, Finland mentioned that the measures to reduce the nutrient load were designed with the requirements to improve the status of marine waters, in addition to that of surface waters. - Finland has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented. - The gap analysis quantifies the extent to which specific measures contribute to achieving GES noting that their effectiveness will depend on how and to what extent they are implemented.
Weaknesses	- Not all measures have yet been implemented. - The timing of implementation of some of the measures appears optimistic and financing of many of the measures remains unclear.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures for D5 in the Baltic Sea had been addressed. In 2022, the assessment considers that all relevant pressures are addressed. - In 2016, the assessment considered that the measures addressed the definitions of GES and targets. Similarly, in 2022, the assessment considers that all components of GES and targets are covered.
D8-Contaminants	
Adequacy	The adequacy of Finland's programme of measures for D8 is considered very good
Strengths	- Contamination pressures and relevant measures are well understood. - Measures have been identified to address pressures where feasible. - The gap analysis recognises that GES may not be achieved for PBDEs for which no additional measures can be taken. - The gap analysis qualitatively evaluates the extent to which specific measures in relation to shipping can contribute to achieving GES. - A range of additional actions are also being taken to manage pollution risks. - Finland has provided most of the necessary information on where, when, and how the additional MSFD specific measures will be implemented
Weaknesses	- Not all measures have yet been implemented as the measures under the Baltic Sea Action Plan. - The financing of many of the measures is not clearly provided.

Progress since 2016	- In 2016, pressures for D8 were considered to be addressed. Similarly, in 2022, the assessment considers that all relevant pressures are addressed. - In 2016, measures were considered to address the definitions of GES and targets. Similarly, the second cycle assessment considers that the assessment covered all components of GES and targets.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Finland's programme of measures for D9 is considered moderate
Strengths	- Contamination pressures and relevant measures for D8 (which are relevant to D9) are well understood. - Finland has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses	- No specific gap analysis is provided for D9. - Not all measures for D8 (which are relevant to D9) have yet been implemented. - The timing of implementation of some of the measures is not clear. - The financing of many of the measures is not clearly provided.
Progress since 2016	- In 2016, pressures for D9 were considered to be covered. However, in 2022, relevant pressures are considered to be only partially addressed due to limited reporting specific to D9. - In 2016, the measures were considered to address the definitions of GES and targets. In 2022, components of GES and targets are considered to be only partially covered due to limited reporting specific to D9.
D10 — Marine litter	
Adequacy 	The adequacy of Finland's programme of measures for D10 is considered good
Strengths	- A gap analysis is provided. - The main pressures related to litter input are addressed by the combined set of measures in the second cycle. - All new measures are linked to operational targets. - Timelines have been indicated for all additional MSFD relevant measures in the second cycle and for the most part it is clear how and where measures will be implemented.
Weaknesses	- Some aspects of the gap analysis are missing: no baselines are mentioned; it is stated that good environmental status is not defined for D10 due to lack of a quantitative determination of GES. - Existing measures are not linked to the environmental targets in a quantitative way.
Progress since 2016	- Compared to the previous assessment, Finland has updated its programme of measures with several additional MSFD specific measures to better account for all the main pressures in its Baltic waters related to D10 (marine litter). - As in 2016, Finland addresses the main pressures related to D10.
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Finland's programme of measures for D11 is considered good
Strengths	- Finland has proposed ambitious new measures to reduce underwater noise through speed limits, technological innovations, and limiting noise generation. - New measures are clearly described including an implementation plan, timetables, and spatial scope.
Weaknesses	- A clear gap analysis was not provided for D11. - There is not a quantitative determination of GES. - No measure address heat impacts and heat discharges and there is no associated target.
Progress since 2016	- Finland's report on D11 underwater noise for the Baltic Sea has made little progress since 2016. - As in the first cycle, the measures do not address the second part of the GES definition dealing with heat impacts and heat discharge.

The adequacy of Finland's programme of measures to address **biodiversity** issues is considered **good.**

D1 — Biodiversity	
Adequacy	 The adequacy of Finland's programme of measures for D1 is considered very good
Strengths	- A strong gap analysis is presented, which has been conducted using a model successfully used by HELCOM (HELCOM SOM). - Weaknesses in the previous programme of measures have been identified and additional MSFD specific measures introduced to help strengthen the current cycle and achieve GES. - The gap analysis identifies the measures necessary to address most of the pressures. - The modified and additional MSFD specific measures address the main pressures threatening biodiversity and are linked to operational environmental targets. - Each measure is matched well with both the relevant pressures and environmental targets. - The practicalities of each new measure are well presented: it is clearly indicated when each measure will be implemented, on what scale, and for how long. - New MPA measures are well reported, with profiles presented for each measure that explain how it will be implemented, as well as links with current policies and with other measures.
Weaknesses	- The gap analysis presents limited updates on the progress of environmental targets. - Updates are also difficult to find for descriptor 1 owing to the structure of the programme of measures itself. - There is no clear chapter that refers to biodiversity, as it is linked to many pressures, making information on the descriptor difficult to pick out. - Information on how the measure will be implemented is not complete, making the effectiveness of the implementation of these measures uncertain - Measures are needed for the hunting of seabirds and to protect spawning areas for migratory fish.
Progress since 2016	- The majority of the recommendations made by the Commission have been covered in the updated programme of measures, showing real progress in the last 5 years. - With regard to the pressures addressed, the assessment concludes that progress has been made in the second programme of measures. - With regard to the coverage of environmental targets and GES, the assessment in 2016 considered these addressed partially by the measures. In 2022, it can be considered that progress has been made since the coverage of targets is considered adequate and in addition, modified and additional MSFD specific measures are in place.
D2 — Non-indigenous species	
Adequacy	 The adequacy of Finland's programme of measures for D2 is considered moderate
Strengths	- A range of measures have been implemented to mostly target shipping (ballast water), which is recognised as the main pathway associated with the introduction of NIS. - Finland has described measures which were not reported in the e-reporting in 2015. - Finland states that IMO updates to the biofouling guidance will be incorporated in the future.
Weaknesses	- Ship hull fouling has been identified as a potential pathway of introduction; however, it is not currently being addressed in the programme of measures. - A new measure regarding the removal of alien predators was recognised by Finland; however, this does not directly link to the pressure related to D2 on the input or spread of NIS or the primary criterion for D2C1.

	- It remains unclear if other pathways such as aquaculture, recreational vessels or hull fouling are accounted for in the measures.
Progress since 2016	- Progress has been made since 2016 as Finland have stated they have achieved GES for D2. - It was highlighted in the previous assessment that it was not clear what pathways the other measures target and if aquaculture was addressed. In 2022, the assessment remains unclear if other pathways such as aquaculture, recreational vessels or hull fouling are accounted for in the measures.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Finland's programme of measures for D3 is considered good
Strengths	- Finland carried out a comprehensive gap analysis; and identified that even though all the first cycle measures had been implemented, progress to GES was insufficient. - 10 additional MSFD specific measures and one updated MSFD specific measure are included in the updated programme of measures to address the gaps identified in their analysis and progress towards achieving GES - The updated programme of measures continues to address all relevant pressures associated with D3.
Weaknesses	- Discrepancies in reporting are detected, particularly with regards to the environmental targets associated with the additional MSFD specific measures. - There is a lack of detail for some fields for additional MSFD specific measures. - No change to existing measures from the first cycle is reported but several existing measures identified as from the first cycle are from after 2015. - Two of the additional MSFD specific measures are classified as 'new' but it appeared from the reporting that they were extensions of MSFD specific measures from the first cycle programme of measures. - Finland does not explain how the effectiveness of the additional MSFD specific measures will be assessed. - There is no measure covering recreational fishing.
Progress since 2016	- In 2016, the assessment concluded that Finland had addressed the key pressure. In 2022, the coverage of pressures was also assessed as being fully addressed. Finland has improved its coverage of pressures by including additional MSFD specific measures in its updated programme of measures. - In the 2016 assessment, Finland was considered to address all components of GES and targets. However, in 2022, the coverage of GES and targets is assessed as being partially addressed.
D4 — Foodwebs	
Adequacy 	The adequacy of Finland's programme of measures for D4 is considered good
Strengths	- The reporting of the relevance of new measures to operational environmental targets is good. - The practicalities of the new measures are also well reported: Finland clearly indicates when each measure will be implemented, on what scale and for how long. - The reporting of new MPA measures is good, with a large amount of detail provided about each new measure. - The details include justification for each measure, as well as conservation objectives and the relation of some measures to Natura 2000.
Weaknesses	- No real gap analysis is provided, making it a major weak point. - The current status reports that food webs meet GES; however, it also reports that eutrophication threatens lower trophic levels. Finland does not report how GES is going to be maintained outside of the measures put in place under D5. - Finland still reports additional MSFD specific measures for D4; however, in most cases, these measures are aimed at other descriptors.

	- Information on how the measures will be implemented is not complete, making the effectiveness of the implementation of these measures uncertain.
Progress since 2016	- A large proportion of these recommendations have not been addressed, meaning moderate progress has been made towards GES in the last 5 years. - In 2016 it is stated that Finland partially covers all relevant pressures. With regard to the pressures addressed in 2022, progress is moderate. - In 2016, Finland covered targets and GES. In 2022, the assessment concludes that GES has been achieved for descriptor 4, meaning progress is expected to be minimal, and the GES should simply be maintained.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Finland's programme of measures for D6 is considered good
Strengths	- A strong gap analysis is presented and this gap analysis has been conducted using a model successfully used by HELCOM. - The gap analysis clearly identifies areas in which the current measures are lacking and proposes additional measures to fill these gaps. - All reported new MPA measures adequately address the identified pressures. Finland makes clear why each new MPA measure is necessary to achieve the GES and what it will do to achieve it.
Weaknesses	- There are limited updates regarding the progress of environmental targets. - Information on the practicalities of new measures is lacking, mostly for how measures will be implemented.
Progress since 2016	- The majority of the recommendations made by the Commission have been covered by Finland in the updated programme of measures, showing real progress in the last 5 years. - Clear progress has been made since 2016. - In 2016, the following conclusions were drawn on pressures: the measures address physical loss and damage caused by dredging but Finland does partially cover nutrient enrichment. In 2022, measures are in place to address eutrophication as a main pressure for seabed. - In 2016, it was concluded that measures partially address seabed species and key habitats, and the targets are addressed by the measures defined for seabed habitat. In 2022, out of the 18 updated and additional MSFD specific measures, 8 measures do not correspond to an operational environmental target.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Finland's programme of measures for D7 is considered very good
Strengths	- Finland considers that its waters are at GES for D7, "hydrographical changes". - Finland carried out a gap analysis for D7, including an assessment of the effectiveness of the existing measures and an assessment of future activities likely to cause pressures linked to hydrographical changes which also considers the likely influence of climate change. - Finland considers that existing and future activities have and will have in the future only local and limited effects and that existing measures (exclusively based on existing legislation) will be sufficient to maintain GES for this descriptor. - The measures are adequately linked to measures implemented under WFD and at regional level (HELCOM).
Weaknesses	- While Finland has defined several environmental targets, none of these environmental objectives can be clearly linked to D7. - No mention is made of the way cumulative impacts are addressed. - Finland's RBMPs provide little details on measures to address hydromorphological pressures.
Progress since 2016	- The programme of measures was considered adequate in 2016 and is unchanged in 2022.

- No additional progress was made, except that now all measures are now reported "ongoing" or "implemented".

Based on the information reported in their programmes of measures, Finland's commitment to the implementation of their second programme of measures is assessed as **'high'**.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when
Finland carried out an impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA), but there is no information on how these influences measure selection or prioritisation. Social assessment of measures focuses on impacts on well-being, human health, living conditions, comfort, and on employment.	Finland provides information on funding sources for each measure, which includes national and EU (e.g. CAP) funds, private funding, and project funds. It is not clear if project funding is related to European research projects, and there is no indication if funding has been secured.	Finland provides details on coordination between the MSFD and the WFD in terms of objectives and implementation of measures (including responsible authorities). However, it did not elaborate on links of MSFD with the CFP, MSP and HBD. Finland undertook coordination and cooperation with countries for each measure. Also presented regional coordination via HELCOM and at EU level (e.g. MSFD working groups).	Where: Measures for nine Descriptors (all except D2 and D7) have sufficient detail on their spatial coverage. How: Measures for only one Descriptor (D11) has sufficient detail, while measures for eight Descriptors only have partial details. When: Measures for eight Descriptors (except for D5) have sufficient information on the temporal coverage. Finland reports that these measures have not yet been implemented but provides an implementation timeframe for 2022-2027.

6.7 France

Summary:

Overall, the second programme of measures presented by France is considered to be moderately adequate to address the pressures acting on the French marine environment and partially contributes to achieving France's GES and targets.

In terms of strengths, France defined a number of new operational targets for which they designed specific measures for almost all descriptors. France carried out CBA/CEA for new measures and CEA results were used to select measures. Social assessment of measures covered impacts on employment and activities. France provided information on funding sources for each measure, including national, regional, local and public funds, and authorities responsible for implementing the new measures have been identified. Measures for litter, biodiversity, including food webs and seafloor integrity, and commercial fish are considered to adequately address pressures identified in French waters.

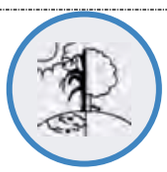
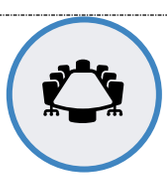
On the downside, France has not always carried out a thorough gap analysis to allow for the identification of gaps to GES and the definition of adequate measures. Measures for eutrophication and contaminants are considered partly insufficient

to cover relevant pressures. France also does not specify the amounts of funding mobilised for different measures and how they will be prioritised. The consultation with neighbouring countries on the transboundary impacts of the measures is unclear. Little information is also provided on the administrative framework in place to implement the programme of measures.

Based on the information reported in their programmes of measures, France's commitment to implement their second programme of measures has been assessed as 'high'.

The adequacy of France's programme of measures for **cross-cutting issues** is considered **moderate**.

The updated programme of measures did not witness major changes since the first cycle, notably for methods applied for measures selection, regional/international cooperation, and public consultation. Overall, for the second cycle, France reported the required information however some of it is missing and/or incomplete. Better understanding and a higher assessment score may have resulted from more information on the various cross-cutting topics.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The selection of new measures has been done by following three main steps: gap analysis, analysing the sufficiency of existing measures, and defining and adopting new measures. A Cost Effectiveness Analysis (CEA) is carried out for new measures. The CEA results are used to identify cost-efficient measures and compare the measures. France undertook an assessment of social issues.	Additional information should have been provided on the cost-efficiency of the measures, the comparison between measures and the methodology influencing measure selection. A Cost Benefit Analysis is not undertaken prior to the implementation of new measures. France does not provide additional information on the methodology followed to assess social issues nor on the results of the assessment
 **Interactions with climate change**		Climate change is not considered in the updated programme of measures.
 **Links to other policies**	Links between MSFD and other EU policies, notably WFD, CFP and BHD were presented by France for every measure. According to the RBPM assessment, all French RBMPs include objectives for the MSFD. It should also be noted that the French programmes of measures has been developed together with the French maritime spatial plans.	No additional information on the mechanisms and outcomes of coordination between MSFD and the mentioned directives was given by France. France does not specify the amounts of funding mobilized, nor on targeted sectors/descriptors for the financing sources mentioned.
	Regional cooperation was done through OSPAR (for North Atlantic Regional Sea) and UNEP/MAP (for Mediterranean Regional Sea).	A transboundary assessment of measures could have been performed. The consultation of neighbouring countries on transboundary impacts of measures is not

Regional cooperation and transboundary impact	Additionally, meetings with neighbouring countries prior to programme of measures adoption were organized to discuss measures.	explicitly mentioned in the programme of measures.
Public consultation and administrative process	Feedback from stakeholders were taken into account in the final version of the programme of measures. Responsible authorities for the implementation of each measure as well as temporal coverage and expected year of end of implementation are presented in the programme of measures.	Information provided by France was limited and superficial and gave little understanding of the administrative framework in place to make the programme of measures operational.

The adequacy of France's programme of measures to address **pollution** issues is considered **moderate.**

Pollution

D5- Eutrophication	
Adequacy 	The adequacy of France's programme of measures for D5 is considered poor.
Strengths	- The additional MSFD-specific measures which seek to reduce excessive nutrient inputs are linked to operational targets. - France has provided most of the necessary information on where, when, and how the additional MSFD-specific measures will be implemented.
Weaknesses	- There is no gap analysis presented. - France has not clearly identified any new or updated existing measures in its reporting. - There are possible omissions in the reporting of measures including updated existing measures (e.g. updated measures for WFD) and new existing measures (National Emissions Ceiling Directive). - There is a lack of information on progress towards GES in any of the sub-regions and no clear assessment is provided of the contribution that existing or new measures make towards achieving GES. - Financing of the measures remain unclear.
Progress since 2016	- In 2016, pressures had been assessed as partially covered. In 2022, it is unclear the extent to which the measures will fully address the pressures owing to limitations in the reporting of progress towards GES and in the gap analysis. - In 2016, measures were assessed as partially covering all components of GES and targets. In 2022, the measures are clearly linked to targets considered to be operational.
D8-Contaminants	
Adequacy 	The adequacy of France's programme of measures for D8 is considered moderate.
Strengths	- The additional MSFD-specific measures proposed by France are linked to operational targets. These are measures that will lead to a reduction in the input of contaminants over time. - France has provided most of the necessary information on where, when, and how the additional MSFD specific measures will be implemented
Weaknesses	- A gap analysis is not presented in the programme of measures. - The progress towards GES is not detailed and no clear assessment is provided of the contribution of existing or new measures make towards achieving GES. - There are possible omissions in the reporting of measures including updated existing measures (e.g. updated measures for WFD) and new existing measures (National Emissions Ceiling Directive). These measures are relevant to substances such as Pb, Cd, Hg, dioxins and dioxin-like substances, PCBs and PAHs (as specified in Regulation 1881/2006).

	- The detail of some of the measures is lacking and financing of most of the measures remains unclear.
Progress since 2016	- In 2016, pressures had been assessed as addressed. In 2022, as no clear analysis of pressures and relevant activities is presented for any of the four subregions, it is not possible to assess progress. - In 2016, all components of GES and targets were partially addressed. In 2022, the measures are linked to targets considered to be operational.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of France's programme of measures for D9 is considered moderate.
Strengths	- The new measure specific to D9 and applicable in the Bay of Biscay and Celtic Sea sub-regions is linked to an operational target. - France has provided most of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses	- A gap analysis is not presented in the programme of measures. - There are possible omissions in the reporting of measures including updated existing measures (e.g. updated measures for WFD) and new existing measures (National Emissions Ceiling Directive). The progress towards GES is not detailed and no clear assessment is provided of the contribution existing or new measures make towards achieving GES. - Financing appears to not be secured for the additional MSFD specific measures.
Progress since 2016	- In 2016, the pressures had been assessed as addressed. In 2022, as none of the text reports for the subregions clearly identify the pressures and relevant activities contributing to contaminants in biota it is not possible to assess progress. - In 2016, all components of GES and targets were considered addressed. In 2022, the measures are linked to operational targets.
D10 — Marine litter	
Adequacy 	The adequacy of France's programme of measures for D10 is considered good
Strengths	- France has provided several modified and additional MSFD-specific measures clearly linked to its two operational targets. - France has adequately explained where, how and when modified and additional MSFD-specific measures will be implemented. - Effort is made to include measures tackling certain knowledge gaps for D10.
Weaknesses	- A quantitative gap analysis is lacking for the four different marine reporting units and a qualitative appraisal of the contribution of the first cycle programme of measures towards GES is provided only for the Greater North Sea. - France's programme of measures focuses on further preventing input of marine litter but does not include any measure related to reducing the already existing level of marine litter. - Recent EU-level developments (e.g., Zero Pollution targets, EU Beach litter thresholds) are not mentioned and there is no reference to the work of OSPAR and Barcelona Convention with regard to marine litter, in particular regional action plans against litter. - Funding mechanisms are only provisional, and it is not explained to what extent France will be able to secure financial means for implementation of all new measures.
Progress since 2016	- Environmental targets have been revised since 2016 in order to make them more operational, and measures of the second cycle are clearly linked to those targets. - In 2016, it was concluded that France had addressed the key pressures and activities. France was also considered to address almost all components of GES and targets for D10 except for micro-litter. - France has identified a number of modified and additional MSFD specific measures which are still considered to address most of the relevant pressures. However, measures explicitly linked to micro-litter, as well as secondary criteria for D10 are still lacking.
D11 — Underwater noise and energy	
Adequacy 	The adequacy of France's programme of measures for D11 is considered moderate.

Strengths	- France has improved the content of its programme of measures by defining a specific measure that address impulsive noise from industrial operations, although this is an indirect measure aiming at improving the knowledge base. - Measure descriptions are overall of good quality, France has adequately explained where, how and when modified and additional MSFD-specific measures will be implemented.
Weaknesses	- The results of the gap analysis are not presented for underwater noise. - Some recommendations from the first cycle were not implemented, such as better linking the programme of measures with monitoring programmes to measure the effectiveness of measures, and establishing links with EU policies and international instruments for underwater noise and energy. - The programme of measures is lacking specific measures to tackle continuous noise from shipping sources and inputs from other anthropogenic sources such as heat and light.
Progress since 2016	- In 2016, all pressures relevant to D11 were considered addressed. In 2022, France enhances its approach to develop the knowledge base on impulsive noise from industrial operations. Continuous noise from shipping activities and any other anthropogenic input such as heat or light sources remain gaps. - As for the environmental targets, in 2016 the assessment found that the measures addressed the D11 GES definition and the targets as they contributed to addressing impulsive and continuous sound issues. - In 2022, both impulsive and continuous noise continue to be addressed although to different degrees and not all relevant activities are covered.

The adequacy of France's programme of measures to address **biodiversity** issues is considered **good.**

Biodiversity

D1 — Biodiversity		
Adequacy		The adequacy of France's programme of measures for D1 is considered very good
Strengths		- A good range of species are addressed in the gap analysis. - Additional gaps relating to public awareness, education and monitoring of species and habitats are also identified. - All relevant pressures are addressed by the updated and additional MSFD specific measures in the second cycle, with measures addressing gaps identified in the gap analysis. - The modified and additional MSFD specific measures in the second cycle contribute to meet the operational environmental targets. - A completely new set of targets has been developed for the current programme of measures. - All additional or updated measures are linked to targets qualitatively. - Details of how the measures will be implanted are extensively reported. France has explained when, how and where the modified and new measures will be implemented; potential funding sources are identified.
Weaknesses		- France only partially reports on where the actions will be carried out, with only broad-scale indications of the areas covered by measures being provided. - The new MPA measures are only partially adequate in addressing identified pressures.
Progress since 2016		- Progress has been made since 2016. - In 2016, France was considered to fully address pressures. The modified and additional MSFD specific measures in the second cycle are also considered to address all relevant pressures. - In the previous assessment, France was considered as fully addressing the coverage of GES and targets. The modified and additional MSFD specific measures in the second cycle

	are also considered to be linked to a completely new range of habitat and species-specific environmental targets.
D2 — Non-indigenous species	
Adequacy 	The adequacy of France's programme of measures for D2 is considered moderate
Strengths	- A range of new cross-cutting measures have been identified which have the potential to indirectly address the input and spread of NIS. - An additional MSFD-specific measure implemented in each French region will directly and indirectly address the input and spread of NIS - Details are provided on where, when and how the measures will be implemented.
Weaknesses	- The gap analysis could have provided more detail on where the current measures were not adequate and what new measures needed to address, for example, NIS introductory pathways. - The link between the additional MSFD specific measure and the operational targets for D2 is not clear as the measure is linked only to 1 of the 4 targets.
Progress since 2016	- Since the last reporting period, it has been acknowledged by France that the measures from the first cycle have not been successful in achieving GES for D2. - It was assessed in 2016 that the pressures for D2 were addressed by the measures. In the second cycle, the range of modified and additional MSFD specific measures predominately directly and indirectly address the input and spread of NIS but some clarifications are needed.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of France's programme of measures for D3 is considered good
Strengths	- A gap analysis has been carried out, and where measures were considered insufficient to meet targets, additional measures have been identified; it is considered likely that the key gaps have been addressed. - France has identified a number of modified and additional MSFD specific measures which are considered to address all relevant pressures. - All the modified and additional MSFD specific measures are linked to environmental targets. - France has revised all of its environmental targets and the new environmental targets appear to be broadly operational as they focus on reducing pressures with the aim of moving towards GES. - France explains where and when the modified and additional MSFD specific measures will be implemented.
Weaknesses	- France partially identifies all significant gaps to achieve the targets and ultimately GES. - The documentation does not provide a clear overview of current status and failings for GES, nor of baseline scenarios for the gap analysis. - Potential funding sources are only mentioned for the implementation. - A timeframe for achieving GES in the future is not provided.
Progress since 2016	- In 2016, the assessment concluded that France had addressed the key pressures. France was also considered to address all components of GES and targets for D3. - In 2022, pressures are also assessed as being fully covered. The modified and additional MSFD specific measures provide good coverage of the targets.
D4 — Foodwebs	
Adequacy 	The adequacy of France's programme of measures for D4 is considered good
Strengths	- All relevant pressures are addressed by the modified and additional MSFD specific measures in the second cycle. - The modified and additional MSFD specific measures in the second cycle contribute to meeting the operational environmental targets for D4. - A complete new set of targets relating to biodiversity has been developed for the current programme of measures.

	- France has clearly explained when, how and where the modified and additional MSFD specific measures for biodiversity will be implemented. - Details on the implementation of the measures are provided.
Weaknesses	- No separate gap analysis has been carried out for descriptor 4 and all three biodiversity descriptors (D1, D4 and D6) are covered by common text reporting due to extensive overlap. - The analysis has only partially identified significant gaps to achieving the targets. - Most measures reported under descriptor 4 are considered indirect.
Progress since 2016	- France was considered to fully address pressures in 2016. In the current report there is a single additional MSFD specific measure which only addresses one aspect of the pressures and so it is considered that only partial progress has been made. - In 2016, France was considered as fully addressing the coverage of GES and targets. In the current report there is a single additional MSFD specific measure aimed at conservation of forage fish stocks. Though relevant for D4, it only addresses one aspect and so it is considered that only partial progress has been made.
D6 — Seafloor integrity	
Adequacy 	The adequacy of France's programme of measures for D6 is considered good
Strengths	- A complete new set of targets has been developed for the current programme of measures. - Additional and updated new measures are reported as directly addressing gaps identified in the gap analysis, they are linked to targets and will address the relevant pressures. - Several direct measures are proposed in the programme of measures and additional measures have been identified addressing pressures indirectly, focussing on education and community awareness. - the modified and additional MSFD specific measures in the second cycle contribute to meeting the operational environmental target. - France has explained when, how and where the modified and new measures will be implemented. Details of how the measures will be implanted is extensively reported in the reporting. - Potential funding sources are identified for most of the measures
Weaknesses	- No separate gap analysis has been carried out for D6-seabed and all three biodiversity descriptors (D1, D4 and D6) are covered by common text reporting due to extensive overlap. - France only partially reports on where the actions will be carried out, with only broad-scale indications of the areas covered by measures being provided. - The content and scale of the measures themselves do not seem enough to achieve GES. Indeed, the focus of the measures on the whole is too restricted, targeting specific species or only small-scale fishing. - There are few measures from France which aim to reduce the scale of bottom fishing in national waters and addressing the damage caused by the construction of wind farms.
Progress since 2016	- Progress has been made by France. - France was considered to address pressures only partially in 2016. It is considered that pressures are better addressed in the current report. - Regarding coverage of GES and targets, the previous assessment considered that seabed habitats were adequately addressed. Modified and additional MSFD-specific measures are linked to appropriate environmental targets in the current report.
D7 — Hydrographical changes	
Adequacy 	The adequacy of France's programme of measures for D7 is considered moderate
Strengths	- France takes specific measures for the different marine regions. - A qualitative appraisal of the contribution of first cycle measures towards GES is provided for the Greater North Sea. - The additional MSFD-specific measures relevant for D7 adequately address the pressures.

	- France has adequately explained where, how and when the additional MSFD specific measures will be implemented.
Weaknesses	- There is a lack of knowledge of the current status against GES for D7 and the environmental targets are not operational. - The lack of clear scenarios for future activities, expected in the next cycle (including large-scale development of offshore windfarms), weakens the gap analysis and hampers the identification and the design of adequate measures. - The measures are general or cross-cutting to all descriptors, thus it is not explained how they are relevant to D7. - Some pressures are not covered such, as large-scale development of offshore windfarms and fishing gear towed on the bottom that affects turbidity. - The additional MSFD specific measures only partially contribute to meeting the operational environmental targets. - The programme of measure is not clear on securing the funding to implement the measures as only potential funding sources are reported.
Progress since 2016	- No progress has been identified since 2016. Coverage of pressures is only partially addressed in 2022. - As in 2016, it is not clear how agriculture and industrial activities are covered in the Mediterranean region. Targets to reduce impacts or turbidity and to reduce impacts on turbidity and currents remain unaddressed.

Based on the information reported in their programmes of measures, France's commitment to the implementation of their second programmes of measures is assessed as '**high'**.

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
France carried out an impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA), which were used to prioritise measures. Social assessment of measures covered impacts on employment and activities.	France provides information on funding sources for each measure, including national, regional and local funds, public establishment funds (e.g. Water Agency, Agency for the Environment and Energy Management), and EU funds (e.g. EMFAF, LIFE Programme). No additional information provided on the funding amounts by each source.	The links between MSFD and WFD, CFP and BHD were presented for every measure. Measures under the relevant directives were taken into account and considered as existing measures. Authorities responsible for implementing measures were listed. France reported on mechanisms for regional (i.e. OSPAR, UNEP-MAP) coordination. It also reported cooperating with neighbouring countries in the development of the second programme of	Where: Measures for nine Descriptors (D2, D3, D4, D5, D7, D8, D9, D10, D11) have sufficient information on spatial coverage. Measures for two descriptors have partial information. How: Measures for four Descriptors (D1, D4, D9, D11) have sufficient information on operationalisation. Measures for seven Descriptors (D2, D3, D5, D6, D7, D8, D10) have partial information. For example, details on modes of action for two D2 measures are missing.

		measures and the outcomes of cooperation.	When: Measures for all 11 Descriptors have sufficient information on the temporal coverage.

6.8 Ireland

Summary:

Overall, the second programme of measures presented by Ireland is considered as adequate to address the pressures acting on the Irish marine environment and contributes to achieving Ireland's GES and targets.

All required information has been included: overview of environmental objectives, update of existing measures from the first cycle and gap analysis, identification and selection of new additional measures for the second cycle. Ireland has identified new spatial protection measures, including marine protected areas with a section entirely devoted to these two new spatial protection measures. It provides further details on MPA development which is meant to be participatory and ecosystem-based. Climate change considerations were included, for the first time, in the updated programme of measures of Ireland.

Measures for several pollution descriptors, as well as NIS and hydrographical conditions, have been assessed as "good" as Ireland has reported having acheived GES for these descriptors and therefore needs to have in place only measures to maintain GES. The rest of the measures have been assessed as "moderate" as Ireland only partially addressed the identified gaps to achieve targets and ultimately GES with its new MSFD-specific measures. No economic analysis was carried out to support the selection of measures. Some information that would have allowed for better understanding the programme of measures is missing; specifically, regarding outcomes of methodologies and coordination between policies.

Based on the information reported in their programmes of measures, Ireland's commitment to the implementation of their second programmes of measures has been assessed as 'medium-high'.

The adequacy of Ireland's programme of measures for **cross-cutting issues** is considered **moderate**.

Ireland respected the MSFD reporting guidelines for information to be reported. However, some information that would have allowed for better understanding is still missing, specifically regarding outcomes of methodologies, coordination between legislations/policies and climate change considerations. Additional information could have allowed a better understanding of the programme of measures, and, eventually, a higher assessment score.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The measure selection involved identifying gaps in achieving GES and putting in place measures to fill those gaps. The updated programme of measures includes 153 measures targeting all descriptors.	Ireland does not explicitly state having conducted an economic analysis and no justification is provided on the absence of this analysis. A Cost Benefits Analysis (CBA) was undertaken for only one MSFD specific measure, while no economic analysis (CBA and/or CEA) was carried out for the rest of measures. Concerning social issues, Ireland does not present any indication of social issues considered; no social assessment was carried

		out to support the development of the programme of measures.
Interactions with climate change	Climate change considerations were included, for the first time, in the updated programme of measures.	Ireland does not provide information on the outcomes of such process, notably on (a) the potential impact of measures on GHG emissions (b) the adaptive and adaptability capacities of the measures, and (c) whether the proposed measures contribute to preserving ecosystem services and socio-economic activities.
Links to other policies	Both cycles took into consideration measures from various EU legislation/policies as existing measures to reach GES. Ireland's updated programme of measures was developed based on existing policy frameworks and measures arising from these frameworks. Ireland provided a list of the different financing sources mobilised for the implementation of the programme of measures.	Ireland does not provide additional information explaining mechanisms of coordination between the different Directives and on outcomes of such coordination. No information was provided on the amounts mobilised from each fund.
Regional cooperation and transboundary impact	Regional cooperation was carried out through OSPAR. Measures agreed upon in regional agreements were included in the updated programme of measures. Ireland discussed and exchanged information on overlapping measures with neighbouring countries and this regional cooperation had an impact on measure selection.	No information is provided on assessing the transboundary impacts of measures. The consultation of the neighbouring countries on transboundary impacts is not made explicit in the programme of measures. The first cycle provided more comprehensive information on regional cooperation, including coordination at the EU level, as well as bilateral cooperation and collaboration with NGOs for the development of the programme of measures.
Public consultation and administrative process	Ireland provided information on the different competent and responsible authorities in charge of implementing and coordinating the programme of measures.	It is not clear from the text how stakeholders' views influenced the final list of measures. The level of information is not sufficient to understand the implementation process and the monitoring and follow-up actions in regard to measures.

The adequacy of Ireland's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Ireland's programme of measures for D5 is considered good.
Strengths		- A gap analysis has been undertaken.

	- The programme of measures clearly makes a link with the WFD reporting. - Ireland has identified a number of updated measures from other initiatives, including OSPAR. - Ireland indicates that GES is being achieved for D5, although it is noted that some transition and near coastal waters remain at risk of eutrophication. - The pressures deriving from agriculture, forestry, urban and industrial discharges are adequately addressed by existing measures mainly.
Weaknesses	- Some of the requirements of the gap analysis are missing, such as baseline scenarios and a clear assessment of progress against targets. - There is no reference to the Zero Pollution targets. - Not enough explanations are provided on the modifications made to the existing measures to understand how they will contribute to maintaining GES for D5.
Progress since 2016	- As in 2016, the 2022 assessment considers that the pressures and ultimately GES are addressed by the updated existing measures.
D8-Contaminants	
Adequacy 	The adequacy of Ireland's programme of measures for D8 is considered good.
Strengths	- A gap analysis has been undertaken. - Ireland provides information on the current state of the descriptor (at least for concentrations in water and some biota) and indicates that GES is being achieved for D8[422]. - Ireland has identified a number of updated and new existing measures, many of them are linked to WFD. - The pressures are addressed by existing measures mainly.
Weaknesses	- Some of the requirements of the gap analysis are missing, such as baseline, alternative scenarios and a clear assessment of progress against targets. - No further detail on specific actions relevant to D8 is provided regarding the implementation of the OSPAR Environmental Strategy measure. - There is no reference to the Zero Pollution targets. - Not enough explanations are provided on the modifications made to the existing measures to understand how they will contribute to maintaining GES for D8.
Progress since 2016	- As in 2016, the 2022 assessment considers that the pressures and ultimately GES are addressed by the updated existing measures.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Ireland's programme of measures for D9 is considered good.
Strengths	- Ireland has identified a number of updated and new measures from other initiatives. - A gap analysis has been undertaken. - Ireland provides information on the current state of the descriptor and indicates that GES is being achieved for D9. - The pressures are addressed by existing measures mainly which consist of several measures that are the same as for D8 as well as some D9 specific measures, e.g. measures implementing the Foodstuffs Regulation 1881/2006 and Council Directive 2006/88/EC and associated Regulations.
Weaknesses	- Some of the requirements of the gap analysis are missing, such as the consideration of climate change, baseline, alternative scenarios and a clear assessment of progress against targets. - No analysis of the individual contribution of the measures towards achieving GES is provided. - Only one additional MSFD specific measure has been reported but it is a cross-cutting measure related to OSPAR's Strategy with no details provided on specific actions relevant to D9.
Progress since 2016	- Similarly, to 2016, the assessment in 2022 considers that the pressures and ultimately GES are addressed by the updated existing measures.

[422] Although it should be noted that the Article 12 assessments noted limitations in Ireland's assessment of progress towards GES

D10 — Marine litter	
Adequacy 	The adequacy of Ireland's programme of measures for D10 is considered **moderate**
Strengths	- Ireland updates and includes clear links to other policy instruments in the programme of measures (implementation of the MSP Directive and/or OSPAR Regional Action plan; EU Single Use Plastic Directive and Microbeads Prohibition Act). - A gap analysis has been undertaken.
Weaknesses	- Some of the requirements of the gap analysis are missing, such as baseline, alternative scenarios and a clear assessment of progress against targets. - There is only one new MSFD-specific measure relevant for D10 which refers to the implementation of the OSPAR NEAES 2030 and is a cross-cutting measure. - Ireland does not report any details on how it will implement this measure in relation to the targets for D10, and also does not include a clear timeline. - It is thus not clear how Ireland aims to achieve/maintain GES for macrolitter on beaches, nor which actions it foresees to achieve GES for the other elements and criteria of D10. - It is noted that while Ireland has indeed reported a decline in the number of beach litter items over the period 2013-2018, the numbers are still higher than the EU Beach litter threshold of 20 litter items/100m coastline.
Progress since 2016	- The adequacy of Ireland's report for D10 in the second programme of measures remains similar to the previous assessment. - Regarding pressures, in 2016, the assessment stated that the measures reported by Ireland addressed the pressures. The second programme of measure is less clear on the actual pressures covered, especially since there is only one additional MSFD specific measure relevant for D10. - As in 2016, the impacts on biota (secondary criteria for D10) are not covered in Ireland's second programme of measures.
D11 — Underwater noise and energy	
Adequacy 	- The adequacy of Ireland's programme of measures for D11 is considered **moderate**
Strengths	- The pressures are addressed by existing measures mainly. - Ireland has adequately updated the existing measures to ensure coherence with recent policy developments. - A gap analysis has been undertaken. - Ireland states that GES has been achieved for anthropogenic impulsive sound element. - Ireland makes specific reference the work of TG Noise to establish spatial and temporal thresholds for C1 and C2 of descriptor 11 relating to the spatial and temporal extent as well as the sound pressure levels required to define Good Environmental Status. - The most significant pressures and activities causing impulsive noise, including hydrocarbon exploitation, marine research and surveys are presented and addressed in the programme of measures.
Weaknesses	- Some of the requirements of the gap analysis are missing, such as baseline, alternative scenarios and a clear assessment of progress against targets. - Continuous underwater noise-causing activities were not assessed due to the lack of developed data and methodologies. - One measure addressing noise from shipping sources has been withdrawn without a clear justification. - The implementation plans for proposed/modified measures are not provided. - The programme of measures lacks specific measures to tackle continuous noise and inputs from other anthropogenic sources such as heat and light.
Progress since 2016	- The adequacy of Ireland's report on D11 in the second programme of measures slightly deteriorated compared to the previous assessment as no progress was made in the identification of gaps regarding continuous noise. The measures reported by Ireland address the

	pressures and related activities for impulsive underwater noise. However, with one measure addressing shipping withdrawn, the programme lacks specific measures to tackle continuous noise as well as anthropogenic sources such as heat and light. - In 2016, the assessment considered that the pressures and ultimately GES were addressed by the updated existing measures. In 2022 this remains true for impulsive noise but not for continuous noise.

The adequacy of Ireland's programme of measures to address **biodiversity** issues is considered **moderate.**

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Ireland's programme of measures for D1 is considered moderate
Strengths	- Ireland has prolonged 15 measures related to D1 from its first cycle PoM. - Ireland has fully explained where and when the three MFSD-specific measures relevant for D1 will be implemented. Timescales for each are provided either explicitly, or through linkage to the timetable for the OSPAR NEA Environment Strategy 2030. - Adequate justification has been provided for the withdrawal of measures from the first cycle.
Weaknesses	- Ireland has only partially identified gaps to achieve MSFD targets, and ultimately GES. - Relevant pressures are only partially addressed by the MSFD-specific measures and it is not clear whether measures from the first cycle are sufficient to address current pressures, such as fisheries. - The two measures that specifically refer to the establishment of MPAs and the reporting of MPA data and management updates to OSPAR are not sufficient in addressing identified pressures. - Ireland does not explain how each measure in the OSPAR implementation plan will be delivered.
Progress since 2016	- It seems that Ireland made a step back since the 2016 report. Elements relating to the gap analysis, pressures addressed, the linkages to operational targets, and designation of MPAs are only partially addressed in the current programme of measures. - Regarding the coverage of pressures, Ireland was assessed as fully addressing pressures in 2016. However, the assessment of the current programme of measures does not match this conclusion.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Ireland's programme of measures for D2 is considered good.
Strengths	- The modified and additional measures from other initiatives have the potential to contribute to achieving and maintaining GES, especially since Ireland has reported that GES is achieved for D2. - The modified measure on recreational vessels is considered to be addressing a pathway of introduction.
Weaknesses	- Partial information was provided in the gap analysis relating to the identification of the pressures that lead to NIS introduction in Irish waters, and no baseline or threshold levels have been established to compare progress from the first cycle measures. - No modified or additional MSFD specific measures were reported by Ireland.
Progress since 2016	- In both 2016 and 2022, Ireland considered that GES had been achieved[423]. - The new and modified measures from other initiatives reported in 2016 and 2022 are considered to address GES by addressing key introduction pathways, but there remain some unclarity as to which pressures may have led to the introduction of NIS in Irish waters.

[423] Although it should be noted that there are some limitations in the GES determination of D2C1 (introduction of NIS).

D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Ireland's programme of measures for D3 is considered **moderate**
Strengths	- Ireland has explained how the updates/changes to the existing measures from the first cycle contribute to achieving GES. The updates include consolidation of measures and reflect the latest relevant legislative developments and progress in implementation. - A gap analysis has been undertaken and is described. - Ireland has reported a large number of measures for D3 overall, most of these are reported as measures coming from other initiatives, adopted under EU legislation, Regional Sea Conventions, other international agreements of national legislation. - The programme of measures covers inshore stocks.
Weaknesses	- It is considered that Ireland only partially identifies gaps to achieve the MSFD targets and ultimately GES. It is therefore unclear to what extent measures taken under other frameworks are sufficient or whether additional measures are needed. - Some of the requirements of the gap analysis are missing, such as baseline scenarios and a clear assessment of progress against targets. - Ireland has reported three additional MSFD specific measures against D3 in 2022 but they are considered to be generic/cross-cutting measures and are not specifically focused on achieving GES for D3. - It is not clear if recreational fishing is adequately addressed by the programme of measures.
Progress since 2016	- The adequacy of Ireland's report for D3 in the second cycle remained similar to the 2016 assessment. In 2016, Ireland's programme of measures was considered to partially address relevant pressures and to address GES and targets. - In 2022, no additional MSFD specific and measures were reported that were specific to D3. Some first-cycle measures from other measures are reported that would address locally/nationally managed stocks so this is likely to be adequately addressed; however, it is not clear whether recreational fishing is adequately addressed by the programme of measures.
D4 — Foodwebs	
Adequacy 	The adequacy of Ireland's programme of measures for D4 is considered **moderate**
Strengths	- There are six measures described as modified since 2015 that relate to D4-food webs - Ireland has fully explained where and when the modified and additional MSFD specific measures relevant for D4 will be implemented. - Timescales for each measure are provided either explicitly, or through linkage to the timetable for the OSPAR NEA Environment Strategy 2030.
Weaknesses	- Ireland has only partially identified gaps to achieve targets, and ultimately GES. - Relevant pressures on food webs, in particular commercial and non-commercial fishing, are only partially addressed by the modified and additional MSFD specific measures, which are broad in scope. - The two measures that specifically refer to the establishment of MPAs and the reporting of MPA data and management updates to OSPAR are not sufficient in addressing identified pressures for D4.
Progress since 2016	- No progress has been made since the 2016 report. - Regarding the coverage of pressures, Ireland was assessed as fully addressing pressures in 2016. However, the assessment of the current programme of measures does not match this conclusion as the additional and updated new measures do not fully address all pressures identified by the gap analysis performed in 2021. - Regarding the coverage of GES and targets, in 2016 Ireland's programme of measures was assessed as addressing general GES components. In the current programme of measures, the targets are not considered operational.

D6 — Seafloor integrity		
Adequacy		The adequacy of Ireland's programme of measures for D6 is considered moderate
Strengths		- Adequate justification has been provided for the withdrawal of measures from the first cycle. - Ireland has fully explained where and when the three modified and additional MSFD specific measures relevant for D6 will be implemented. The measures are all strategic and so apply to all of Ireland's marine regions. - Timescales for each measure are provided either explicitly, or through linkage to the timetable for the OSPAR NEA Environment Strategy 2030. - The two measures that specifically refer to the establishment of MPAs and the reporting of MPA data and management updates to OSPAR are addressing identified pressures for D6 but are necessarily limited in scope.
Weaknesses		- Ireland has only partially identified all significant gaps to achieve MSFD targets, and ultimately GES. - Relevant pressures are only partially addressed by the modified and additional MSFD specific measures. - The modified and additional MSFD specific measures are not linked to targets that can be considered operational. - Ireland has only partially explained how the measures will be implemented. While modes of action for each measure are described in the text reporting, no indicators are reported for any.
Progress since 2016		- Progress has been made since 2016. - Ireland was assessed as fully addressing pressures in 2016. However, the assessment of the current programme of measure does not match this conclusion as the additional and updated MSFD specific measures do not fully address all pressures identified by the gap analysis performed in 2021. - Regarding the coverage of GES and targets, in 2016 Ireland's measures were considered as only partially ensuring sea-floor integrity, ecosystem functioning and the protection of benthic ecosystems. Measures in the current programme of measure will help address this deficiency, though these are not linked to operational targets.
D7 — Hydrographical changes		
Adequacy		The adequacy of Ireland's programme of measures for D7 is considered good.
Strengths		- Ireland's programme of measures for the second MSFD cycle is very similar to its first cycle, which is consistent with Ireland's assessment that its marine waters are at GES for D7. - The programme of measures is adequately linked to work at regional level in OSPAR. - In the gap analysis, Ireland identified potential issues linked to its plans to develop offshore windfarms and considers that these additional pressures can be addressed through the update of guidance on offshore wind energy
Weaknesses		- The main changes are linked to updates of policy instruments. Ireland does not explain clearly how these changes can contribute to maintaining GES. - No detail is provided on how the additional MSFD specific measure will be implemented and will contribute to maintaining GES for D7 in Ireland's waters, or to achieving the only environmental target for D7.
Progress since 2016		- In 2016, it was concluded that the measures adequately covered all pressures, GES and target definitions. In 2022, the assessment provides similar conclusions.

Based on the information reported in their programmes of measures, Ireland's commitment to the implementation of their second programmes of measures is assessed as '**medium-high**'.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when
Ireland has undertaken a Cost-Benefit Analysis for one new measure only. There is no reference to investigation of social impacts of measures.	Ireland relies mostly on national funds; EMFAF is planned to co-fund measure to support the effective delivery of CFP and addressing the many impacts of the EU-UK Trade and Cooperation Agreement. No information is provided on the amount from the European fund.	Links between the MSFD and other key relevant policies (WFD, MSP, CFP, and HBD) are mentioned, and relationships between the MSFD descriptors and other policies are also outlined. Authorities responsible for implementing and coordinating measures are identified. Ireland has reported on the outcomes of coordination and cooperation within OSPAR and how these have fed into the development of the second programme of measures.	Where: Measures for three Descriptors (D1, D4, D6)[424] provide sufficient information, and these measures cover the whole of Ireland's marine region. How: Measures for three Descriptors (D1, D4 and D6) provide partial information on operationalisation. When: Measures for three Descriptors (D1, D4, D6) provide sufficient information on temporal coverage.

6.9 Italy

Summary:

Overall, the second programme of measures presented by Italy is considered to be not adequate to address the pressures acting on the Italian marine environment.

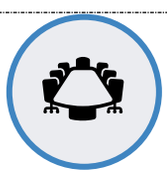
Italy did not provide sufficient information in the different sections that would have allowed a proper assessment and/or better understanding of what has been done in the updated programme of measures. Because of this lack of information, it has proven very difficult to assess progress since 2016; in addition, because of the lack of a proper gap analysis, it is impossible to assess the potential of the few additional measures presented by Italy to support the achievement of GES. Out of all descriptors, only measures for non-indigenous species are considered to be moderately adequate, the rest has been assessed as either 'poor' or 'very poor'.

Based on the information reported in their programmes of measures, Italy's commitment to the implementation of their second programme of measures has been assessed as 'low'.

The adequacy of Italy's programme of measures for **cross-cutting issues** is considered **very poor**.

Information is very partial and does not allow understanding of the methodology followed nor results and outcomes. Due to lack of information, there is not enough information and data allowing to analyse progress since 2016.

[424] Ireland reported modified and additional MSFD specific measures only for the biodiversity-related Descriptors: D1, D4 and D6.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	An impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA) is undertaken.	No information is provided on the methodologies followed for both analyses, nor on results and outcomes. Whether economic analysis carried out helped in decision-making, notably for selecting measures, is uncertain. The programme of measures lacks element referring to the social impact of the measures.
 **Interactions with climate change**		Climate change is not covered in the updated programme of measures.
 **Links to other policies**	Links between the MSFD and other EU legislations, notably WFD, MSP, CFP, and BHD are mentioned. In its 3rd RBMP reporting under the WFD, the coordination between MSFD and WFD is less clearly reported: references to synergies and coordination are reported in only two of the RBMPs examined in detail and in rather general terms.	The mechanisms and outcomes of coordination between MSFD and other EU legislations are not presented. The programme of measures does not include much information on financing sources mobilised by Italy, except the "recovery fund", which is assumed to be the European Recovery and Resilience Fund. Italy does not provide any additional information regarding European funds.
 **Regional cooperation and transboundary impact**	The Mediterranean Action Plan (UNEP-MAP) is mentioned.	Italy does not provide any information on coordination with neighbouring countries. Italy does not provide any information on regional cooperation and therefore no information on the transboundary impacts of the proposed measures is provided.
 **Public consultation and administrative process**	Italy provides information on the competent authorities in charge of the implementation of the programme of measures.	No reference is made to the public consultation, how Italy took into account stockholders views and the administrative process. This is different from the WFD RBMP exercise where Italy has reported extensive public consultation exercises. The information provided was not enough to understand if the administrative process proposed makes the programme of measure operational.

The adequacy of Italy's programme of measures to address **pollution** issues is considered **very poor.**

D5- Eutrophication		
Adequacy		The adequacy of Italy's programme of measures for D5 is considered poor.
Strengths		- The additional MSFD specific measures identified by Italy in the programme of measure directly address pressures relevant to D5 (input of nutrients and organic substances). It is consistent with the assessment of Italy's RBMPs which all include measures to reduce nutrient pollution.
Weaknesses		- Italy does not report any information regarding whether a gap analysis has been carried out and how this analysis might affect the selection of additional MSFD specific measures and modification of existing ones. - No additional information is provided regarding how other pressures are being addressed and how Italy is acting to achieve GES. - The two additional MSFD specific measures are linked to a partially operational target. - Italy has provided only partial information on how, when, and where the measures will be implemented. - The programme of measures does not refer to the Zero pollution Action plan. - It remains unclear whether or when GES might be achieved for D5. The assessment of Italy's RBMPs concludes that nutrient pollution from diffuse agricultural and urban wastewater point sources are the main reasons for ecological status failure for all water bodies, showing that it remains an important pressure that needs to be tackled.
Progress since 2016		- In 2016, it was considered that coverage of pressures had been addressed for all the activities. In 2022, the extent to which relevant pressures are addressed by the additional MSFD specific measures is not clear as the measures identified are lacking information. - In 2016, it was considered that the measures addressed D5 GES and targets. However, in the 2022 assessment, it is considered that the measures address partially D5 GES and environmental targets since the targets linked to the additional MSFD specific measures are not wholly consistent and a target was considered only partially operational.
D8-Contaminant		
Adequacy		The adequacy of Italy's programme of measures for D8 is considered very poor.
Strengths		- None identified.
Weaknesses		- No information is provided on: the updates/changes to the measures, the gap analysis, the current status of marine waters. - No additional MSFD specific measures have been identified. - The Italian programme of measures remains unclear on whether or when GES might be achieved for D8.
Progress since 2016		- In 2016, it was considered that coverage of pressures had been partially addressed. As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made. - The 2016 assessment considered that the programme of measures partially addressed components of GES and targets. As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made.
D9 — Contaminants in seafood		

Adequacy		The adequacy of Italy's programme of measures for D9 is considered **poor**.
Strengths		- GES is reported as achieved under Article 8.
Weaknesses		- No information is provided on: the updates/changes to the measures, the gap analysis, the current status of marine waters. - No additional MSFD specific measures have been identified.
Progress since 2016		- In 2016, it was considered that coverage of pressures had been addressed. As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made. - In 2016, it was considered that the assessment partially addressed components of GES and targets. As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made.
D10 — Marine litter		
Adequacy		The adequacy of Italy's programme of measures for D10 is considered **poor**.
Strengths		- New measures from the second cycle are linked to operational targets. - Italy has adequately explained where additional MSFD specific measures will be implemented.
Weaknesses		- Italy does not report any information regarding whether a gap analysis has been carried out and how this analysis might affect the selection of additional MSFD specific measures and modification of existing ones. - It is also not entirely clear whether the pressures addressed by the new measures are indeed the most relevant to marine litter in Italian waters. - Italy does not report clear or extensive measure descriptions for the new measures. - Existing measures have not been updated, nor have any measures been withdrawn. - As the status of the new measures is indicated as 'implemented', it is difficult to assess how Italy aims to further improve progress towards GES and how and over which timeline Italy aims to use this set of new measures.
Progress since 2016		- In 2016, Italy reported marine litter as a pressure, with shipping, tourism, fisheries and urban areas activities identified as contributing sources. In 2022, almost all new measures intent to tackle the pressure of marine litter input; however, it is not clear that the new set of new measures covers all relevant pressures. - In 2016, the existing and new measures have been linked to two specifics targets. In 2022, Italy has not reported new targets in the programme of measures.
D11 — Underwater noise and energy		
Adequacy		The adequacy of Italy's programme of measures for D11 is considered **very poor**.
Strengths		- None identified.
Weaknesses		- No information is provided on: the updates/changes to the measures, the gap analysis, the current status of marine waters. - The Italian programme of measures remains unclear on whether or when GES might be achieved for D11.
Progress since 2016		- In 2016, it was considered that coverage of pressures had been addressed and it was considered that the measures partially addressed components of GES and targets because they did not address the impact of noise. - As no modified or additional MSFD specific measures have been identified in 2022, no proper assessment of progress can be made.

The adequacy of Italy's programme of measures to address biodiversity issues is considered **poor**.

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Italy's programme of measures for D1 is considered very poor.
Strengths	- Italy has partially explained where new measures will be implemented.
Weaknesses	- No information regarding the gap analysis was provided. The lack of gap analysis prevents us from knowing which pressures should be addressed by the updated programme of measures in order to achieve the environmental targets and ultimately GES. Therefore, there is no certain way to know how adequate the measures proposed are. - Not all the relevant pressures are addressed by the proposed updated and additional MSFD specific measures. - Other pressures might be covered by the existing measures from 2016 programme of measures that is still in place or by measures linked to pressure descriptors; however, since Italy has not provided any additional information regarding these links this is uncertain. - How the new measures will be implemented is unclear, because no description of the "modes of action" is reported, and the implementation mechanisms are incompletely reported. - Italy has poorly explained when new measures will be implemented: it is unclear how the new measures can be fully implemented in 2022. - The new MPA measure is identifying the subject of protection unclearly and detailed information on how to reach the targets set is missing.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures was addressed except for water column habitats. However, in 2022, not all of the relevant pressures are addressed by the proposed modified and additional MSFD specific measures. - In 2016, Italian targets were partially addressed for all biodiversity components of the assessment. In 2022, not all measures are linked to operational environmental targets.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Italy's programme of measures for D2 is considered moderate.
Strengths	- The new measures do address all relevant D2 pressures and their potential sources. - Italy has also partially linked new measures to operational targets. - Italy has adequately explained where the modified and additional MSFD measures will be implemented.
Weaknesses	- Italy does not report any information regarding whether a gap analysis has been carried out and how this analysis might affect the selection of additional MSFD specific measures and modification of existing ones. - The information provided on how and when these will be implemented is incomplete or even unclear.
Progress since 2016	- In 2016, the measures addressed the pressure of the introduction of NIS and all relevant activities including aquaculture and shipping. Similarly, in 2022, the new measures do address all relevant D2 pressures and their potential sources. - In 2016, the measures addressed the GES and targets. In 2022, Italy has partially linked new measures to operational targets, but not all.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Italy's programme of measures for D3 is considered poor.

Strengths	- Italy provides details on how, where, and when the two additional MSFD specific measures will be implemented. - The new measures, in combination with the existing measures, broadly address most aspects of pressures for D3 (fishing pressure), through CFP regulations, as well as measures specifically linked to local management plans (for non-CFP stocks) and recreational fishing.
Weaknesses	- Italy does not provide information regarding the updates to existing measures from the first cycle, the current status of the environment regarding D3 and the gaps to achieve GES. - The reporting is brief and does not provide details on the gap analysis; it is therefore not possible to assess the adequacy of the updated programme of measures. - Italy does not provide any information on the extent to which GES is achieved. - The measures only partially addressed relevant pressures to D3, and they are not linked to environmental targets reported under D3. - Measures related to monitoring should not be reported as a measure. - The measures do not appear to specifically address age/size distribution of stocks, despite Italy including D3C3 in their determination of GES under Article 8.
Progress since 2016	- In 2016, it was concluded that Italy had addressed the key pressure (i.e extraction of species, fish and shellfish) for D3. In 2022, coverage of pressures by modified and additional MSFD specific measures is partial. - In 2016, Italy was considered to partially address all components of GES and targets for D3. The coverage of GES and targets is also considered partial in 2022. - In 2016 it was considered that new measures were necessary to address the pressure from recreational fishing. An additional MSFD specific measure is presented in the 2022 programme of measures to address this.
D4 — Food webs	
Adequacy 	The adequacy of Italy's programme of measures for D4 is considered **poor.**
Strengths	- Italy has well explained where new measures will be implemented. - The new MPA measure partially identifies the subject of protection, it aims to expand the network of MPAs and enhances existing measures in MPAs; however, detailed information on how to reach the targets set is missing.
Weaknesses	- No information regarding the gap analysis was provided. The lack of gap analysis prevents to clarify which pressures should be addressed by the updated programme of measures to achieve the environmental targets and ultimately GES. - There is no certain way to know how adequate the measures proposed are. - The lack of gap analysis makes it unclear which pressures are to be addressed, and therefore it is unclear whether these measures adequately cover the relevant pressures. - How the new measures will be implemented remains unclear. - Italy has poorly explained when new measures will be implemented: it is unclear how the new measures can be fully implemented in 2022.
Progress since 2016	- In 2016, pressures were considered covered. However, in 2022, not all the relevant pressures are addressed by the proposed updated and additional MSFD specific measures. - In 2016, the targets were partially addressed by the measures. In 2022, none of the new measures proposed in this programme of measures are linked to an operational environmental target.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Italy's programme of measures for D6 is considered **poor.**

Strengths	- The majority of new measures proposed by Italy represented actions to achieve operational environmental targets. - Italy has partially explained where new measures will be implemented.
Weaknesses	- No information regarding the gap analysis was provided. The lack of gap analysis prevents to clarify which pressures should be addressed by the programme of measures to achieve the environmental targets and ultimately GES. - The lack of gap analysis prevents to know how adequate the measures proposed are. - The relevant pressures are not addressed by the proposed updated and additional MSFD specific measures. - How the new measures will be implemented is unclear, because no description of the "modes of action" is provided and the reporting of the implementation mechanisms is incomplete. - Italy has poorly explained when new measures will be implemented: it is unclear how the new measures can be fully implemented in 2022. - The new MPA measure is missing information on how to reach the targets set. - The programme of measures lacks information regarding the conservation objectives and none of the pressures reported for the sea-floor integrity descriptor are addressed.
Progress since 2016	- In 2016, the measures partially addressed the relevant pressures for D6. In 2022, the relevant pressures are not addressed by the proposed updated and additional MSFD specific measures. - In 2016, the seabed habitats targets were partially addressed by the measures proposed by Italy. In 2022, most of the new measures proposed by Italy represent actions to achieve operational environmental targets.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Italy's programme of measures for D7 is considered poor.
Strengths	- GES is reported as achieved under Article 8.
Weaknesses	- There is a lack of information on gap analysis and on the current status of marine waters. - Inconsistencies in reporting do not allow to understand if modified measures relate to D7. - The cumulative impacts do not appear to be covered, no modified nor additional MSFD specific measures have been defined for D7 by the Member State to address them. - The measures aim to increase knowledge and not address the pressures, so targets defined for D7 are not addressed by any modified measure. - As highlighted in the assessment of Italy's RBMPs, Italy still needs to set type-specific reference conditions as regards hydro-morphological quality elements for coastal waters.
Progress since 2016	- In 2016, the measures reported covered all possible pressures, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. It should however be noted that cumulative impacts do not appear to be covered. In 2022, not update has been made to cover cumulative impacts. - In 2016, Italy did not provide detailed information on its existing measures for D7. In 2022, no additional MSFD-specific measures have been defined for D7 by Italy.

Based on the information reported in their programmes of measures, Italy's commitment to the implementation of their second programmes of measures is assessed as **'low'**.

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**

An impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA) is undertaken. However, there is no mention of how results influenced measures selection or prioritisation. There is no reference to the investigation of social impacts of measures	Very limited information on financing sources (i.e. 'secured' from national budget), and no specific information on EU financing sources except for a mention of mobilising a 'recovery fund'. This recovery fund could be related to the European recovery fund however it is not clear from the text.	Italy identified relevant EU legislation, notably the CFP, MSP, WFD and HBD that are linked to the measures. However, Italy did not provide information on coordination with neighbouring countries, except for a mention of the UNEP-MAP.	Where: Measures for five Descriptors[425] (D2, D3, D4, D5, D10) have sufficient information on spatial coverage. Measures for two Descriptors (D1 and D6) have partial information, while measures for D7 do not have clear information on spatial coverage. How: Measures for three Descriptors (D2, D4 and D5) have partial information on operationalisation. Measures for five Descriptors (D1, D4, D6, D7, D10) do not have clear information on operationalisation. For example, financing for all measures is reported as 'secured' under the state national budget but no further details are provided When: Measures for two Descriptors (D3, D5) have partial information on temporal scope, while measures for six Descriptors (D1, D2, D4, D6, D6, D10) do not have clear information on temporal scope.

6.10 Latvia

Summary:

Overall, the second programme of measures presented by Latvia is considered as moderately adequate to address the pressures acting on the Latvian marine environment and partially contributes to achieving Latvia's GES and targets.

Latvia has undertaken a socio-economic assessment of the new measures adopted including a financial cost assessment and has undertaken a strategic environmental impact assessment including transboundary impacts of its updated programme of measure. For several descriptors, Latvia has identified all significant gaps towards the targets and ultimately GES. In general, Latvia provides detailed information on where, when, and how the new measures will be implemented. Measures for eutrophication, contaminants and non-indigenous species have been assessed as adequate to address the relevant pressures.

However, the lack of new measures for underwater noise, hydrographical conditions, commercial fish and food webs has been assessed as particularly problematic. In several instances, Latvia has not explained how measures from other frameworks contribute to achieving GES making it difficult to know whether new measures are needed.

Based on the information reported in their programmes of measures, Latvia's commitment to implement their second programme of measures has been assessed as 'high'.

[425] Italy did not report modified and additional MSFD specific measures for D8, D9 and D11.

The adequacy of Latvia's programme of measures for **cross-cutting issues** is considered **good**.

Overall, Latvia reported on all the items of information required, but some information provided is incomplete or not sufficient. The programme of measures demonstrates Latvia's understanding of how achieving objectives of the MSFD is also contingent on efforts in other policy areas (European Green Deal, the updated Baltic Sea Action Plan…). Compared to the fist cycle programme of measures, Latvia undertook a comprehensive cost-benefit and cost-effectiveness analysis on the additional MSFD specific measures.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	Latvia provides a socio-economic assessment of the additional MSFD specific measures, where a cost-benefit and cost-effectiveness analyses as well as a financial cost assessment were performed. Latvia performed a cost-effectiveness analysis on some of the MSFD specific measures that directly address pressures and identified the most cost-effective measures. Latvia provides qualitative information on the indirect financial costs of the measures that will be incurred by marine/coastal sectors and users.	There is no evidence that social impacts of measures were considered in the selection and development of individual measures and on the overall second programme of measures.
 **Interactions with climate change**	Latvia mentioned different national, regional and European policies, strategies, plans and initiatives related to climate change which are linked to marine environmental policy.	There is no clear evidence that Latvia's second programme of measures has been developed to be part of Latvia's climate change adaptation strategy.
 **Links to other policies**	Latvia reports measures linked with the WFD and highlighted which measures will be delivered under the country's 2022-2027 River Basin Management Plan. They also report measures related to spatial protection under maritime spatial planning; however, this was explicitly linked with the Habitats Directive. Latvia reported the national and EU financing sources that will support the implementation of the measures. Latvia made references to the European Green Deal, the Biodiversity Strategy 2030 and the Zero Pollution Action Plan and described how national and regional policies and governance link with these EU policies.	Latvia has not reported on any measures that are related to the CFP as their gap analysis has not concluded that measures related to D3 (commercial fish and shellfish) are required. Latvia has not reported on whether or not coordination between the MSFD and other EU legislation (e.g. WFD, CFP, HBD and MSP) has evolved since the first programme of measures. Where a measure is expected to be funded by a mix of sources, Latvia has not provided details on the proportion or amounts that come from the different sources.

Regional cooperation and transboundary impact	Latvia presented how the work done via HELCOM, the Baltic Sea Action Plan and at the EU level are expected to contribute to achieving GES. They also presented how work at the EU and regional level has contributed to the development of Latvia's second programme of measures. Latvia undertakes a strategic environmental impact assessment including transboundary impacts. These impacts were used to further develop the second programme of measures.	Latvia has not reported any changes in mechanisms of coordination, so it is not clear if nothing changed or if this information was missed in the reporting. No information is provided if Latvia consulted with other Member States on the transboundary impacts of measures during the consultation, or through HELCOM.
Public consultation and administrative process	Latvia held a public consultation for its second Programme of measures and the Environmental Report. For each measure, Latvia reported the progress and timeline of implementation (e.g. implemented in 2022, to end in 2027), the responsible authority and other institutions involved in the implementation, the expected result from implementing the measures, the indicator to assess effectiveness of the measure, the indicative cost of the measure and the source of funding for the measure.	The approach to public consultation of Latvia's second programme of measures is simpler compared to the one deployed for the first. The consultation of the latter involved several events such as meetings, discussions and seminars with different stakeholder groups, whereas the second programme of measures was put out for consultation online. Latvia has not reported on how results from the public consultation were taken into account in the development and finalisation of the second programme of measures.

The adequacy of Latvia's programme of measures to address **pollution** issues is considered **moderate.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Latvia's programme of measures for D5 is considered good.
Strengths		- Latvia has provided information on how updates to existing measures and additional measures from other initiatives contribute to achieving GES. - The programme of measures references most of the relevant measures including reference to the EU Green Deal, WFD, and Zero Pollution targets. - Latvia has undertaken a relatively detailed gap analysis taking account of the nitrogen and phosphorus reduction targets identified in the Baltic Sea Action Plan. - The new measures are linked to the targets and the indicators that will be used to monitor implementation of the measures. - Latvia has provided all necessary information on where, when, and how the new specific measures will be implemented.
Weaknesses		- The gap analysis has not yet fully quantified the contribution of updated and new measures from other initiatives (particularly WFD measures) towards achieving GES.
Progress since 2016		- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the coverage of relevant pressures is addressed as the new measures address the relevant pressures, but it is unclear whether the measures will be sufficient to achieve GES due to current limitations in the gap analysis.

	- In 2016, it was considered that the measures addressed the components of GES and targets. In 2022, the modified and new measures are considered to partially address GES and targets.
D8-Contaminants	
Adequacy 	The adequacy of Latvia's programme of measures for D8 is considered **good**.
Strengths	- Latvia has provided information on how modified and additional measures from other initiatives contribute to achieving GES. - Latvia has undertaken a relatively detailed gap analysis taking account of the contaminant reduction targets identified in the Baltic Sea Action Plan. - The programme of measures links the new measures to the target and describes indicators that will be used to monitor implementation of the measure. - Details of where, how, and when the new measures will be implemented are well presented. - The programme of measures makes references to the EU Green Deal, WFD, and the Zero Pollution targets.
Weaknesses	- The gap analysis has not yet fully quantified the contribution of new measures from other initiatives (particularly WFD measures) towards achieving GES. - The measures will support reductions in inputs from key substances such as TBT, PBDE and PFOS although these reductions and their contribution in terms of progress towards GES have not been quantified due to current limitations in the gap analysis.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures was partially addressed, as the new measures address the relevant pressures, but it is unclear whether the measures will be sufficient to achieve GES due to current limitations in the gap analysis. - In 2016, the assessment considered that the measures addressed the components of GES and targets. In 2022, the assessment considers that the modified and additional MSFD specific measures has not adequately addressed GES and targets.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Latvia's programme of measures for D9 is considered **moderate**.
Strengths	- GES is reported as achieved under Article 8. - Some of the D8 additional measures from other initiatives and new MSFD measures will contribute towards achieving targets and maintaining GES for D9.
Weaknesses	- Latvia has not provided any information on how the measures from other initiatives (including additional ones) contribute to maintaining GES. - Latvia has not undertaken a gap analysis for D9 on the basis that GES is already being achieved. The programme relies on the analysis done for D8. However, the gap analysis should have taken account of potential future pressures and their influence in maintaining GES.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures and GES and targets had been addressed. In the absence of new measures, in particular to ensure that GES is maintained, no assessment of progress can be made.
D10 — Marine litter	
Adequacy 	The adequacy of Latvia's programme of measures for D10 is considered **moderate**.
Strengths	- Reference is made to EU beach litter thresholds as well as Zero Pollution targets. - The gap analysis is rather complete for D10. - Latvia has provided all necessary information on where, when, and how the new measures will be implemented.

Weaknesses	- Latvia has reported two new measures from other initiatives in its second cycle but is not entirely clear how to which extent they will contribute to achieving GES for D10. - The gap analysis is focused on macrolitter on beaches and no assessment is made for either (micro-)litter in the water column, or impact on marine species. - Direct measures are missing in Latvia's programme of measures, and pressures related to litter input from shipping and tourism are not specifically addressed. - The programme of measures is lacking measures specifically targeting litter on the seabed or in the water column, or litter ingested by animals. - Broad timelines are provided for all new measures, but it remains unclear when implementation of some of these measures will start exactly or when GES is expected to be reached.
Progress since 2016	- The adequacy of Latvia's measures for D10 remains partial, as was the case in the 2016 assessment. No progress has been made. - In 2016, the assessment considered coverage of pressures addressed. The assessment of the second cycle concludes that measures partially cover the relevant pressures associated with D10. - In 2016, Latvia had not defined GES for D10 and indicated that the D10 target would be addressed through the measures. In the 2022 assessment, the measures are only aimed at indirectly preventing further litter input.

D11 — Underwater noise and energy		
Adequacy		The adequacy of Latvia's programme of measures for D11 is considered very poor
Strengths		- None identified.
Weaknesses		- There is no mention of D11, impulsive noise or low frequency continuous noise in the programme of measures. - Latvia does not define any D11-specific measure in its second programme of measures. - Latvia has withdrawn some of the research and monitoring measures reported as relevant to D11 in 2016.
Progress since 2016		- The adequacy of Latvia's Art 13 report on D11 has deteriorated. No progress has been made. - In 2016, the assessment considered coverage of pressures partially addressed. It appears that in the 2022 programme of measures, Latvia has withdrawn some of the relevant measures for D11. - The coverage of GES and related targets is, similarly to the first cycle assessment, inadequate.

The adequacy of Latvia's programme of measures to address **biodiversity** issues is considered **poor**.

Biodiversity

D1 — Biodiversity		
Adequacy		The adequacy of Latvia's programme of measures s for D1 is considered moderate
Strengths		- Latvia has explained how the updates to the existing measures from the first cycle contribute to achieving GES. - Implementation of the additional measures are well described. - Three measures refer to the introduction of new spatial protection through MPAs. - Where, how and when modified and additional MSFD specific measures will be implemented is reported clearly. - A clear financial source is provided for all MSFD specific measures. - Latvia demonstrates plans to coordinate with other legislation in order to meet MSFD targets.

Weaknesses	- The gap analysis is considered partially adequate, as not all biodiversity elements are included. - Fish species and pelagic habits are not included in the gap analysis. - Modified and new measures in the second cycle only partially address relevant pressures as most of the measures are linked to a single pressure, disturbance of species. - Several measures refer only to the gathering of knowledge and so cannot be considered as addressing pressures. - None of the additional MSFD specific measures contribute to meeting operational targets. - For the new MPAs, the range of species and pressures addressed is limited and details of conservation objectives and measures are not provided.
Progress since 2016	- The adequacy of Latvia's report on D1-biodiversity in the second programme of measures shows only little progress since the 2016 assessment.

D2 — Non-indigenous species

Adequacy		The adequacy of Latvia's programme of measures for D2 is considered **very good**
Strengths		- Latvia has adequately identified all significant gaps to achieve the MSFD targets and ultimately GES. All relevant pressures are identified. - The gap analysis provides an overview of the current status and expected changes in loads until 2027 ('baseline scenario') and quantifies the gap to achieve GES and as a consequence the need for specific measures to address a specific pressure. - An overview of progress on the environmental target is provided. - All relevant pathways have been identified in the gap analysis. - An overview of how existing policy measures will reduce pressure during the 'base-case' period is provided. - Latvia explained where the modified and additional MSFD specific measures will be implemented - all the required schema fields are specified for all relevant measures and the implementation locations are considered adequate.
Weaknesses		- Latvia has partially explained how updates to existing measures contribute to achieving GES. - Latvia has not reported any first cycle measures as having been withdrawn, although there were five measures reported in the first cycle that have not been included in the reporting for the updated programme of measures.
Progress since 2016		- The adequacy score of Latvia's report on D2 in the second programme of measures has improved compared to the 2016 assessment. - Regarding the coverage of pressures, Latvia was assessed as partially addressing pressures in the 2016 assessment. In the second programme of measures, Latvia has made good progress by directly addressing previous recommendations on pressures. - The 2016 assessment flagged some of the measures as more suitable for the MSFD Monitoring Programmes (Article 11) rather than the programme of measures. It seems that Latvia has moved these across to monitoring although this is not clear in the reporting.

D3 — Commercial fish and shellfish

Adequacy		The adequacy of Latvia's programme of measures for D3 is considered **very poor**
Strengths		- None identified.
Weaknesses		- Latvia has not included any measures related to D3 and it is not clear whether the 2016 measures reported for D3 are still in place.

	- Latvia refers to the achievement of GES through the implementation of the CFP but there are no measures reported in 2016 or 2022 about delivery of the CFP or national regulations. - Updates to existing measures have not been clearly explained and their contribution to achieving GES is not presented. - Latvia does not adequately identify all significant gaps to achieve the MSFD targets and GES.
Progress since 2016	- In 2016, the assessment concluded that Latvia had addressed the key pressures. In 2022, the coverage of pressures was not assessed as no modified or additional MSFD specific measures were reported. However, as measures addressing the pressure were not reported as part of the programme of measures it can be considered that the pressures have not been adequately addressed by the programme of measures. - In the 2016 assessment, Latvia was considered to address all components of GES and targets for D3. In 2022, the coverage of GES and targets was not assessed as there were no modified or additional MSFD specific measures reported for D3. In 2022, no measures being reported for D3, the programme of measures cannot be considered to adequately address GES and targets.
D4 — Food webs	
Adequacy 	The adequacy of Latvia's programme of measures for D4 is considered very poor.
Strengths	- None identified.
Weaknesses	- There are no updated existing measures and insufficiency of data made not possible to assess GES compliance. - The gap analysis only considers descriptors where GES has been shown not to be achieved, so D4-food webs is not included. - As no new pressures are identified, nor any new measures reported, the assessment of pressure, targets or implementation is not possible. - No specific links between MPA measures and D4-food webs are made and no pressures are identified.
Progress since 2016	- The adequacy of Latvia's report on D4-food webs in the second programme of measures shows no progress since the 2016 assessment. - GES is still not clearly defined or assessed, and no new measures have been proposed, including activities which could have addressed the data deficiency and allowed progress.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Latvia's programme of measures for D6 is considered moderate.
Strengths	- Latvia has explained how the updates to the existing measures from the first cycle contribute to achieving GES. - The gap analysis is complete and, even if seabed integrity was assessed as in good condition, an assessment of GES for benthic habitats under D1-biodiversity has been included. - Details of where, how, and when measures will be implemented are well presented. - A clear financial source is provided for all new measures. - Latvia demonstrates plans to coordinate with other legislation in order to meet MSFD targets.
Weaknesses	- Modified and new measures in the second cycle do not address relevant pressures. Five additional MSFD specific measures are reported, all linked to a single pressure: disturbance of species. - Several measures refer only to the gathering of knowledge and so cannot be considered as addressing pressures.

	- None of the additional MSFD specific measures contribute to meeting operational targets. - New MPA measures do not address a full range of pressures nor do they include details of objectives or management.
Progress since 2016	- The adequacy of Latvia's report on D6 in the second programme of measure shows some progress since the 2016 assessment. - Although new measures are presented, GES is still poorly defined and associated targets are not operational. The gap analysis has identified pressures on seabed habitats, though these are not addressed in the new measures.

D7 — Hydrographical changes		
Adequacy		The adequacy of Latvia's programme of measures for D7 is considered poor.
Strengths		- Some of the main elements of the gap analysis are presented.
Weaknesses		- No measures are reported for D7, as in 2016. - Latvia mentions that one measure (environmental impact assessment, linked to the EIA Directive) is implemented, but this is not explicitly reported. - Latvia's updated Programme of Measures is still not sufficient to ensure that the GES for D7 will be achieved or maintained by the end of the second MSFD cycle. - One environmental target has been defined; however, it is not operational and not clearly covered by the updated programme of measures.
Progress since 2016		- Like in 2016, no measures are defined for D7. - Pressures coverage remains as "Not addressed" in 2022 as no measures are defined.

Based on the information reported in their programmes of measures, Latvia's commitment to the implementation of their second programme of measures is assessed as '**high**'.

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
Latvia has undertaken an impact analysis of some of the new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA). However, it is not clear how results have influenced measure prioritisation or selection. Latvia has examined qualitative impacts of measures on employment and activities.	Latvia has reported the following sources of funding: the national budget, EU funds (e.g. LIFE programme, EMFAF, Interreg BSR), and private funding where relevant (e.g. for ports to provide ballast water deposition facilities). Latvia has not provided information on the proportion of the total cost of measures that will be funded by the EU funds.	Latvia has highlighted the links between the MSFD, the CFP, MSP, WFD and HBD in terms of objectives and measures and the authorities responsible for implementation. It has also highlighted national strategies and actions (e.g. Latvian Maritime Spatial Planning 2030) that are linked to these EU policies. Regional coordination is done through HELCOM and Latvia has presented how work at the EU and regional level has contributed to the	Where: Measures for six Descriptors (D1, D2, D5, D6, D8, D10) provide sufficient information on spatial coverage.[426] For example, measures for D6 cover Latvia and their EEZ. How: Measures for six Descriptors (D1, D2, D5, D6, D8, D10) provide sufficient information on operationalisation When: Measures for six Descriptors (D1, D2, D5, D6, D8, D10) provide sufficient

[426] Latvia did not report modified and additional new measures for D3, D4, D7 and D9. Latvia made no mention of underwater noise (D11) in their second Programme of Measures.

		development of the second programme of measures.	information on temporal scope.

6.11 Lithuania

Summary:

Overall, the second programme of measures presented by Lithuania is considered as **not adequate to address the pressures acting on the Lithuanian marine environment.**

Lithuania performed a financial cost analysis, a cost-effectiveness analysis and a cost-benefit analysis for existing and additional MSFD specific measures. Lithuania has considered the impacts of climate change in their assessment of the state of the descriptors. For a number of topics, Lithuania has provided relatively good information on where, when and how the specific additional MSFD specific measures will be implemented.

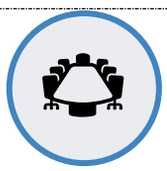
On the downside, no descriptor was considered to be covered by adequate new measures, although measures for contaminants, eutrophication, litter and non-indigenous species have been assessed as moderately adequate to address pressures. For most descriptors, Lithuania has undertaken at most a very partial gap analysis if at all. Consequently, no additional measures are provided for a number of descriptors; notably on underwater noise, birds or seafloor integrity. For most descriptors, no information is provided to indicate what contribution the measure might make towards achieving operational targets and GES. There is no or very limited references to other initiatives, in particular WFD. There is uncertainty on whether funding of the measures has been secured.

Based on the information reported in their programmes of measures, Lithuania's commitment to implement their second programme of measures has been assessed as **'high'**.

The adequacy of Lithuania's programme of measures for **cross-cutting issues** is considered **moderate**.

There are topics such as the cost-benefit and cost-effectiveness analysis where Lithuania provided in-depth information on the approach and results. However, there are several areas (e.g. outcomes of regional seas conventions or international agreements) where the information provided is limited, and there are cases where Lithuania has not reported the information (e.g. public consultation).

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	Lithuania performed a financial cost analysis, a cost-effectiveness analysis and a cost-benefit analysis for 41 additional and existing measures. Lithuania provided in-depth information on the approach and results of the cost-benefit and cost-effectiveness analysis.	Lithuania has not reported on how the economic assessments influenced the selection of the final list of measures included in their programme of measures. There is no evidence to indicate that Lithuania investigated specific social issues relevant to the implementation of the programme of measures. social acceptability of the measures given the distribution of impacts, impact on vulnerable groups.
	Lithuania considered the impacts of climate change in their assessment of the state of the descriptors.	Lithuania has not reported if and how they considered climate change in the selection of measures. As for its 3rd RBMPs under the WFD, Lithuania does not sufficiently build on the findings to

Interactions with climate change		define measures and/or to future-proof measures.
 **Links to other policies**	Lithuania's work for their second cycle of the MSFD contributed to their National Water Plan, which also includes national implementation of the Water Framework Directive and the Floods Directive. Lithuania also provided a breakdown of the value of funding they anticipate to receive from some of the European Funds.	Lithuania does not provide additional information on mechanisms and outcomes of coordination and whether coordination with other EU policies/legislation helped and/or influenced measures selection. Lithuania does not report a specific amount that will be spent specifically for the MSFD and the measures.
 **Regional cooperation and transboundary impact**	Lithuania showed strong considerations of multilateral actions in the Baltic Sea via HELCOM and listed existing measures (same as in the MSFD programme of measures) that are in line with specific actions in the Baltic Sea Action Plan.	Lithuania does not report on key outcomes of cooperation with other agreements. Lithuania does not present information on transboundary impacts of measures, and they don't report if they notified neighbouring Member States of the transboundary impacts of measures.
 **Public consultation and administrative process**	Lithuania provided a high-level description of how the MSFD (alongside the WFD and the Floods Directive) will be implemented in terms of the timeline, the authorities responsible, the requirement for monitoring progress against objectives, the source of funds to support implementation, and the requirement to inform the public annually about the implementation progress.	Lithuania has not provided information on the public consultation they carried out. Lithuania has not reported if there have been changes in the implementation process and/or the administrative framework since the first cycle of the MSFD.

The adequacy of Lithuania's programme of measures to address **pollution** issues is considered **poor.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Lithuania's programme of measures for D5 is considered moderate
Strengths		- Lithuania has provided a partial gap analysis which quantifies the contribution of existing Baltic Sea Action Plan measures being applied in Lithuanian waters. - The additional MSFD specific measures are linked to targets that were assessed as operational. - Lithuania has provided some of the necessary information on where, when and how the specific additional MSFD specific measures will be implemented
Weaknesses		- Lithuania has not provided information on how updates to existing measures and additional measures from other initiatives contribute to achieving GES. - The gap analysis does not take account of the effect of other existing measures. Therefore, in the absence of a detailed gap analysis it is not possible to quantitatively determine what contribution the measures might make towards achieving operational targets and GES.

	- There is no reference to the WFD which is extremely relevant for D5 if measures are implemented. However, according to the assessment of Lithuania's 3rd RBMPs, more effective measures to improve the ecological status of coastal water bodies, including measures to reduce nitrate and nitrogen pollution are needed. - There remains uncertainty concerning whether funding of the measures has been secured.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. The 2022 assessment considers that the modified and additional MSFD specific measures partially cover the relevant pressures. - In 2016, the assessment considered that the measures addressed the components of GES and targets as the measures. In 2022, the assessment considers that the measures partially cover GES and targets.
D8-Contaminant	
Adequacy 	The adequacy of Lithuania's programme of measures for D8 is considered **moderate**
Strengths	- The additional MSFD specific measure is linked to a target that was assessed as operational. - Lithuania has provided all necessary information on where, when, and how the additional MSFD specific measure will be implemented. - Lithuania has provided a partial gap analysis which quantifies the contribution of existing Baltic Sea Action Plan measures being applied in Lithuanian waters referring to four specific substances (mercury, TBT, PFAS and diclofenac),
Weaknesses	- Lithuania has not provided information on how updates to existing measures and additional measures from other initiatives contribute to achieving GES. - Lithuania's gap analysis does not take account of the effect of other existing measures. The gap analysis refers only to four specific substances, although GES is currently not being achieved for a wider range of substances in Lithuania's waters. - There is no reference to Zero Pollution targets or National Ceilings Emissions Directive as 'existing' measures. Both are potentially relevant updated measures for D8. - There is no reference to the WFD which is extremely relevant for D8 if measures are implemented. However, according to the RBMP assessment, measures must in particular be taken to improve the poor chemical status of Lithuania's coastal water bodies, based on a source-to-sea-approach that also identifies origins of coastal pollution inland.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures was not clear as no analysis has been provided as to whether the additional MSFD specific measure addresses the relevant pressures. - In 2016, the assessment considered that the measures partially addressed the components of GES and targets. In 2022, the assessment considers that the measures partially covered GES and targets.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Lithuania's programme of measures for D9 is considered **very poor**
Strengths	- None identified.
Weaknesses	- Lithuania has not provided information on how updates to existing measures and new existing measures contribute to achieving GES. - No additional MSFD specific measures have been identified relevant to D9. - It is unclear whether GES is currently being achieved for D9 and the assessment of Lithuania's 3rd RBMPs concluded that all coastal water bodies are reported to be in a poor chemical status. - Lithuania has not provided any information on its gap analysis for D9.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022 no modified and additional MSFD specific measures are identified.

	- In 2016, the assessment considered that the measures partially addressed the components of GES and targets. In 2022, the assessment has not identified any modified or additional MSFD specific measures.
D10 — Marine litter	
Adequacy 	The adequacy of Lithuania's programme of measures for D10 is considered moderate
Strengths	- Lithuania has provided a partial gap analysis which focuses on quantifying the contribution of existing Baltic Sea Action Plan measures to the status for (mainly macro-) litter in Lithuanian waters. - Lithuania has partially explained where, when, and how the new measures will be implemented. - There is reference to EU beach litter threshold values in the reporting.
Weaknesses	- It remains unclear how the updates to the measures will contribute to achieving GES. - It is not clear whether and how the effect of other existing measures has been considered. GES is currently not being achieved for D10 (macro-litter on beaches and seafloor) in its waters. - New measures are linked to an environmental target that was not considered operational. - There remains uncertainty on the implementation status of the additional D10-related measure, given that "implementation has not started" but no reasons are given for the delay. - Lithuania continues to lack a clear definition of GES under MSFD D10 and does not provide any environmental targets. - No specifics are given on the inclusion of macro- versus micro-litter, or the impact of litter on marine species. - A clear timeline to achieve GES is also lacking.
Progress since 2016	- The adequacy of Lithuania's Art.13 report on D10-Marine Litter has not improved since the first cycle assessment. - In 2016, the assessment considered coverage of pressures addressed, but the assessment of the second cycle concludes only partial coverage of the relevant pressures to achieve GES, as micro-litter and litter input from sources such as shipping are not translated into dedicated measures in the second cycle. - The coverage of GES and related targets is, similar to the first cycle assessment, inadequate.
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Lithuania's programme of measures for D11 is considered poor
Strengths	- None identified.
Weaknesses	- There is no gap analysis reported for D11 measures. - Lithuania reports one existing measure aimed at developing two measurement stations on underwater noise. This measure does not directly contribute to achieving GES. - The measures defined by Lithuania are still at a very early stage of defining the monitoring and gathering data for both impulsive and low continuous noise. - None of the measures aim at mitigating or reducing pressures to reduce noise, and possibly achieving GES.
Progress since 2016	- In 2016, the assessment considered coverage of pressures partially addressed. In the second programme of measures, the measures are still focused on improving the monitoring efforts and therefore do not have a direct impact on reduction of the pressure. - The coverage of GES and related targets is, similar to the first cycle assessment, inadequate. Lithuania has still not defined GES under Article 9 and the D11 target under Article 10 is not operational.

The adequacy of Lithuania's programme of measures to address **biodiversity** issues is considered **poor**.

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Lithuania's programme of measures for D1 is considered **poor**
Strengths	- Lithuania is making efforts towards the conservation of birds and marine mammal species in other frameworks which may contribute towards GES.
Weaknesses	- No gap analysis is provided by the Member State aside from a brief update on the current status of fish and bird species in Lithuanian waters. - No reporting on the current status of marine mammals or pelagic habitats is provided. - No new measures regarding birds reported. - The contribution to the MSFD targets is not clearly stated. - Current, existing and new measures do not cover pelagic species, meaning they are not covered at all by the current programme of measures. - No detailed locations are provided for the new measures and very little information on the implementation steps and the timeline of these actions is reported. - It is difficult to determine how effective these measures will be at addressing pressures and contributing towards targets and GES.
Progress since 2016	- In 2016, the assessment determined that pressures and targets were partially addressed by the measures in the programme of measures. The lack of gap analysis means that it is not clear how much progress these measures can make towards GES, and how much work is needed from new MSFD-specific measures. - For Pelagic habitats, no progress has been made since 2016 with no references made to this habitat.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Lithuania's programme of measures for D2 is considered **moderate**
Strengths	- The three modified measures have the potential to indirectly reduce the pressures relating to D2 and improve knowledge base. - The link between the modified measures and other policies is clear. - A gap analysis is included in the separate report, 'Strengthening Environmental Protection Management of the Lithuanian Baltic Sea - Final Report', based on HELCOM's Suffiency of Measures analysis, on the extent to which existing measures are contributing to achieving GES. - Lithuania has explained where the new measures will be implemented.
Weaknesses	- The four new measures will only indirectly address the pressures relating to D2 as they are focused on trainings, early warning systems and improving the knowledge based. Although these measures can also contribute to reducing pressure levels, there is a lack of more direct measures addressing the relevant introduction pathways. - The single target reported for D2 under Article 10 was not considered measurable or operational.
Progress since 2016	- In 2016, Lithuania's measures were considered to have partially addressed the pressure of NIS and the activities reported under Article 8. In 2022, the assessment remains the same. - In 2016, Lithuania's measures were considered to address GES and targets. In 2022, in the absence of information regarding achieving of GES, it is not clear whether measures are sufficient to achieve GES or not.
D3 — Commercial fish and shellfish	

Adequacy 	The adequacy of Lithuania's programme of measures for D3 is considered **poor**
Strengths	- The gap analysis includes a quantitative and qualitative analysis of the impact of existing and new measures
Weaknesses	- Lithuania has not clearly explained how updates to existing measures contribute to achieving GES. - Lithuania partially identifies the gaps to achieve the MSFD targets and ultimately GES. - The additional MSFD specific measures do not represent actions that will reduce pressures, and are not relevant to D3 species (cod, herring, sprat and flounder). They will therefore not contribute to reducing pressures for GES under D3. - Additional measures are needed to address the poor status of age/size structure for herring.
Progress since 2016	- In 2016, Lithuania's programme of measures was considered to partially address relevant pressures on fish stocks. In 2016, the programme of measures was considered to partially address GES and targets. - In 2022, there is one updated existing measure and three additional MSFD specific measures for D3 reported. These measures are considered not to be relevant to pressures related to D3; therefore, no progress can be considered to have been made in relation to pressures or coverage of GES/targets.
D4 — Food webs	
Adequacy 	The adequacy of Lithuania's programme of measures for D4 is considered **very poor**
Strengths	- None identified.
Weaknesses	- Food web health is not explicitly referred to. - An update on the current status of food web health is not provided. - The new measure introduced under D4 is evidently designed for D1. - The reporting of the new measure itself is also inadequate, with little to no information about when and how the measure will be implemented. - Only one of the pressures is covered by the new measures, and only indirectly through gathering more knowledge. - Measures which address only two species groups, whilst beneficial, will not cover food web health entirely as this is dependent on the health of every trophic level.
Progress since 2016	- In 2016, the assessment determined that pressures were partially addressed under D4 by the measures in the programme of measures. - No progress has been made since 2016, measures continue to partially address pressures and do not address targets for both fish and marine mammals. - There has also been no progress made in assessing and managing D4 in its own right.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Lithuania's programme of measures for D6 is considered **very poor**
Strengths	- The programme of measures gives a brief update of the current status of seabed habitats.
Weaknesses	- No proper gap analysis is provided for seabed integrity and no update on progress towards environmental targets is provided. - Despite seabed integrity status being poor due to human activity pressures, no additional MSFD specific or updated measures are introduced under D6, in particular to directly reduce the pressure of physical disturbance and loss from damaging human activities, such as bottom-trawl fishing.
Progress since 2016	- In 2016, the assessment determined that neither the pressures nor the targets were addressed by the measures in the programme of measures. - No progress has been made since 2016. - Pressures and targets for seabed integrity remain unaddressed by the measures as no new measures have been introduced for descriptor 6 in the updated programme of measures.

D7 — Hydrographical changes		
Adequacy		The adequacy of Lithuania's programme of measures for D7 is considered poor.
Strengths		- Lithuania produced an assessment of pressures from existing and future activities that are likely to affect hydrographical conditions. - Some existing measures from the WFD programme of measures or linked to EIA are already implemented.
Weaknesses		- Lithuania has not defined any operational environmental targets that could guide progress towards ultimately achieving GES. - No measure is identified to limit these pressures from existing and future activities. - No updated or new measures are reported.
Progress since 2016		- Lithuania's adequacy score for its report on its programme of measures for D7 has slightly progressed since 2016, since some elements of the gap analysis are provided in the programme of measures. However, like in 2016, no measures are defined for D7.

Based on the information reported in their programmes of measures, Lithuania's commitment to the implementation of their second programmes of measures is assessed as 'high'.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when
Lithuania has carried out an impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA), but there is no information on how these influences measure selection or prioritisation. Lithuania has not investigated or reported on social impacts of measures, but presented the benefits of achieving GES using a benefits transfer of ecosystem services valuation from other Baltic countries.	Lithuania has reported national, municipal, Klaipeda port and EU (e.g. Horizon Programme, EAFRD, Cohesion policy) funds to support the implementation of measures. It has also provided a breakdown of the value of funding it anticipates receiving from some of the European Funds, but the amount to be spent specifically for the MSFD and the measures are not reported.	Lithuania has described the alignment of some of the measures in the second programme of measures with the measures for the Nemunas River Basin Management Plan for the WFD. Links to the MSP and HBD are highlighted through two measures, but there is no reference to the CFP. Authorities responsible for implementation are listed against each measure. Regional cooperation is done via HELCOM, and the second programme of measures has been developed with actions under the Baltic Sea Action Plan in mind.	Where: Measures for six Descriptors (D2, D4, D5, D8, D10, D11) have sufficient information on spatial coverage, and measures for D1 have partial information[427]. How: The measure for D8 has sufficient information on operationalisation, and measures for five Descriptors (D2, D4, D5, D10, D11) only have partial information. There is no information on operationalisation provided for measures for D1. When: The measure for D8 is reported to have already started implementation. Measures for four Descriptors (D2, D4, D5, D10, D11) have partial information on their temporal scope, while

[427] Lithuania did not report modified or additional MSFD specific measures for D3, D6, D7 and D9.

		measures for D1 and D4 do not have information.

6.12 Netherlands

Summary:

Overall, the second programme of measures presented by the Netherlands is considered to be **moderately adequate** to address the pressures acting on the Dutch marine environment and partially contributes to achieving the Netherlands' GES and targets.

The updated PoMs presented by the Netherlands is very complete; both e-reporting and text reporting give a clear overview of the required information. The financing sources that will support the implementation of measures are clear and appropriate and regional collaboration and policy integration are well described. Measures for seafloor integrity (D6) and hydrographical changes (D7) have been assessed as highly adequate to address relevant pressures.

Little information however was provided on the economic analysis carried out, notably on the categories of costs and benefits and on how economic analysis helped in selecting measures. Similarly, how the Netherlands has taken into consideration climate change in the selection of its measures is not clear. Measures against eutrophication and contamination, as well as measures to protect foodwebs, have all been considered as poor or very poor.

Based on the information reported in their programmes of measures, the Netherlands' commitment to the implementation of their second programme of measures has been assessed as '**medium**'.

The adequacy of the Netherlands' programme of measures for **cross-cutting issues** is considered **moderate**.

The updated programme of measures of the Netherlands did not experience significant changes since the first cycle in terms of methods applied for measures selection, reported links between the MSFD and other policies, regional and/or international cooperation, and public consultation.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	New measures were developed with an objective to reach good environmental status (GES) when gaps were identified. This selection of the measures was done by undertaking a Cost-Benefit Analysis (CBA).	The Netherlands did not provide any information on how results of CBA were used to select/adapt/remove measures initially considered. The Netherlands did not present an indication of social issues considered and analysis to support the development of the programme of measures.
 **Interactions with climate change**	The Netherlands considered the effects of climate change on the marine environment while developing/elaborating the updated programme of measures. The Netherlands will take action to enhance knowledge on the understanding of the impacts of ocean acidification on ecosystem services.	The Netherlands did not report detailed information on how climate change was considered in selecting measures notably on reducing greenhouse gases emissions or enhancing the adaptive capacity and resilience of marine ecosystems. In its 3rd RBMP reporting under the WFD, the Netherlands refer to the National Climate Change Adaptation Strategy as a vehicle to address, amongst others, water issues. However, for the MSFD programmes of

		measures it is unclear if the proposed measures are part of the climate change adaptation strategy of the country or not. It is unclear whether new measures will help preserve ecosystem services and socio-economic activities against climate impacts.
Links to other policies	The programme of measure refers to the links between the MSFD and other EU policies (WFD, MSP, CFP, BHD). Financing of new measures is majorly done by national sources. The amount of funding mobilized by NL for the period of 2022 - 2027 was estimated at 88 million EUR	Coordination mechanisms between the MSFD and the different policies were not listed nor described. A more detailed analysis would be required to understand whether all EU financing opportunities have been seized or not.
Regional cooperation and transboundary impact	The Netherlands cooperates with neighbouring countries through OSPAR and the EU CIS MSCG. The Netherlands allowed OSPAR contracting parties to express their views on the programme of measures.	The Netherlands did not specify if transboundary impacts of the proposed measures have been assessed or not or considered in the consultation.
Public consultation and administrative process	Public consultation on the draft of the programme of measures was carried out by means of a written consultation and discussed with stakeholders during individual discussions. It is in line with the assessment of the Dutch 3rd RBMPs which concludes that the Netherlands provides a case of good practice for public involvement.	It is unclear if feedback from the consultation process has led to changes in measures selection

The adequacy of the Netherlands' programme of measures to address pollution issues is considered **moderate.**

Pollution

D5- Eutrophication	
Adequacy	The adequacy of Netherlands' programme of measures for D5 is considered poor.
Strengths	- Eutrophication and relevant measures are well understood and in place to address them. It is consistent with the assessment of Netherlands' 3rd RBMPs which mentions that measures to address nutrients/pesticides and point source are in place. - Measures are in place to address many of the key pressures contributing to elevated concentrations of nutrients in the marine environment. - Information relevant to a gap analysis has been presented.
Weaknesses	- The gap analysis does not identify how existing measures contribute to achieving GES and what new measures are needed to achieve GES. - The Netherlands has not clearly identified any new measure and has not identified any existing measures that need to be updated, for instance under the WFD, despite the fact that the RBMPs have been updated since the last cycle.

	- Some new measures may have been introduced in relation to improving the number of farms and associated livestock. - It remains unclear whether and when GES might be achieved for D5. - No references have been made to the National Emissions Ceiling Directive or the Zero Pollution Action Plan.
Progress since 2016	- In 2016, all pressures were considered addressed. In this cycle, it is unclear whether all relevant pressures are addressed. - Recommendations made in the last cycle have not all been addressed, notably the Netherlands still cannot determine whether or when GES will be achieved for D5.
D8 — Contaminants	
Adequacy 	The adequacy of Netherlands' programme of measures for D8 is considered poor.
Strengths	- Relevant measures are proposed to address many of the key pressures contributing to elevated concentrations of contaminants in the marine environment. - The gap analysis included most of the relevant information. - For D8, the Netherlands assesses that 'good environmental status is likely to be achieved for most substances in the period 2022-2028. For persistent substances only, the effects of the policy are still difficult to demonstrate'. At the same time, the assessment of Netherlands' RBMPs concludes that none of the coastal water body are in good chemical status. - The evolution of substance concentrations, including the increase of copper, is closely monitored.
Weaknesses	- The gap analysis does not identify how existing measures contribute to achieving GES and what new measures are needed to achieve GES. - The Netherlands has not clearly identified any new measure neither any existing measures that need to be updated. - Some new measures may have been introduced, for example in relation to PFAS and managing risks of lead contamination from fishing. - No references have been made to the National Emissions Ceiling Directive or the Zero Pollution Action Plan.
Progress since 2016	- In 2016, all pressures were considered addressed. In this cycle, it is unclear whether all relevant pressures are addressed. - Recommendations made in the last cycle have not all been addressed, notably the Netherlands has not attempted to quantify the level of pressures for D8.
D9 — Contaminants in sea food	
Adequacy 	The adequacy for Netherlands' programme of measures for D9 is considered good.
Strengths	- GES is currently achieved and is expected to continue to be achieved based on existing actions. - There may be some additional MSFD specific measures under D8, which would also be relevant to maintaining GES for D9.
Weaknesses	- No information is provided on updates/changes to existing measures, although there could be some relevant updates/changes to measures within RBMPs and measures required in relation to the National Emissions Ceiling Directive.
Progress since 2016	- GES for D9 is assessed as being (and will continue to be) achieved - therefore no additional measures are required to address the pressures.
D10 — Marine litter	
Adequacy 	The adequacy for Netherlands' programme of measures (programmes of measures) for D10 is considered good.
Strengths	- The Netherlands provides a gap analysis, including an overview of the current environmental status on all features within D10. - The Netherlands has adopted a list of 9 modified new measures and 5 additional new, in addition to an elaborate list of 11 existing measures. These measures are considered adequate to address GES.

	- The Netherlands provides adequate details on how and where the measures will be implemented and specifies a temporal scope for all new measures of the second programme of measures. - The Netherlands will be following up closely on the indicators for micro-litter. - There is a reference to the EU Threshold levels for beach litter in the introduction of the dedicated chapter on Marine Litter in the text report.
Weaknesses	- The lack of distinction between existing and new measures complicates the assessment on how existing measures from the first cycle contributed to achieving GES. - The Netherlands does not clearly report on a baseline scenario or a timeline showing when the measures, initiatives and/or policies will achieve GES. - The indicators for micro-litter are still being developed today. - It remains unclear whether the EU Threshold levels for beach litter were incorporated in the programmes of measures.
Progress since 2016	- In 2016 the measures were considered to be addressing the relevant pressures by targeting both macro and micro litter. This is also the case for the second programme of measure. - In 2016, the report stated that all measures would support the progress towards GES by 2020. In the 2022 report, the overall conclusion for D10 is that the amount of litter in marine environments, (both macro and micro) is indeed decreasing over time and that the amount of waste and micro-waste absorbed by marine animals is at a level that is not harmful to the health of the species concerned. - A specific timeline had not been provided in 2016, whereas the e-reporting in 2022 provides some clarity on this (although not for all measures).

D11 — Underwater noise and energy	
Adequacy	The adequacy for Netherlands' programmes of measures for D11 is considered moderate.
Strengths	- The Netherlands provides an overview of the measures implemented in the first cycle and of GES and environmental targets. - Both impulsive noise and continuous noise are considered in the programmes of measures.
Weaknesses	- The gap analysis is limited to presenting the knowledge needs for the second cycle. - Only two additional measures are defined: Developing an assessment framework for seismic research and Support IMO review and update guidelines. - Continuous noise is not adequately addressed and proposed measures in the current programmes of measures to tackle these pressures are not clearly defined and seem to be postponed until revisions are concluded by IMO.
Progress since 2016	- The Netherlands has made just a small update to the programmes of measures, adding two category 1. a measure and no new measures. - The D11 measures address the reported pressures and cover the GES and target definition for D11. - Since 2016, the Netherlands has updated a number of existing measures that show progress with the management of impulsive noise but the Netherlands has not shown progress with regard to continuous noise.

The adequacy of the Netherlands' programme of measures to address biodiversity issues is considered **moderate.**

Biodiversity

D1 — Biodiversity	
Adequacy	The adequacy for Netherlands' programmes of measures for D1 is considered moderate.
Strengths	- The Netherlands successfully identifies gaps in how 2016 measures supported progress towards GES. - The gap analyses for some species groups are clear.

	- An effort has clearly been made by the Netherlands to identify areas in which improvement can be made. - The proposed protective areas are useful for addressing some pressure. - The links are made between additional and updated new measures and the identified pressures which they aim to combat, as well as clear reporting of its implementation.
Weaknesses	- The gap analyses for some species groups are insufficient. - The additional new and updated measures presented in this programme of measures do not completely cover the gaps identified in the gap analysis. For instance, gaps in knowledge on seabirds and a complete lack of assessment methods for pelagic habitats are not addressed at all, despite preventing the achievement of GES. - Areas in which improvement can be made have not been addressed. - The links between the new additional and updated new measures and environmental targets is not clear. - The justification of updated and additional measures from other initiatives and their role in the progress towards GES is not clear.
Progress since 2016	- Overall, progress since 2016 is minimal. - The measures implemented in the 2016 programmes of measures showed some efforts in reducing relevant pressures. The new and adapted measures show little progress towards reducing significant pressures and achieving targets, since most of these are enlargement or designation of protected areas but still on a relatively small scale.
D2 — Non-indigenous species	
Adequacy 	The adequacy for Netherlands' programmes of measures for D2 is considered **good**.
Strengths	- The Netherlands have made clear that all existing measures have been fully implemented for D2. - GES for D2C1 has been considered to be achieved by the Netherlands, and hence no specific gaps were identified for achieving D2. - In the gap analysis it is mentioned that investigation is needed into whether further measures are needed to prevent non-indigenous or farmed seaweed species being grown in the North Sea and the potential risks posed by the use of hard substrates in the North Sea
Weaknesses	- No updated or additional MSFD specific measures were identified for maintaining GES, including on emerging issues identified although the Netherlands is investigating other pathways of introduction with the aim to minimise new introductions further.
Progress since 2016	- In 2016, the Netherlands measures adequately addressed pressures relating to the introduction of NIS, specifically from shipping and aquaculture pathways. In 2022, these measures have now been fully implemented and the Netherlands states that introductions have reduced.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy for Netherlands' Programmes of measures for D3 is considered **moderate**.
Strengths	- The text report provides a brief summary of fish stock status in relation to the fish community (D1) and highlights that not all commercial species are fished at F<Fmsy (D3C2).
Weaknesses	- The existing measures from the last MSFD programmes of measures have not been explicitly updated. - The gap analysis is very brief and does not appear to comprehensively consider issues across different stocks or different fleet segments. - Despite conclusions on currently failing GES for certain stocks, the Netherlands concludes that it is possible to achieve GES for D3C1 and D3C2 without additional measures to be taken for the duration of this programmes of measures. - It is not clear whether mortality from recreational fisheries is adequately considered and addressed.

Progress since 2016	- In the 2016, it was concluded that, the Netherlands had addressed the key pressures. It was highlighted at the time that it was not clear whether recreational fishing is included in its programmes of measures. In 2022, there were no modified or new measures reported. The question over whether recreational fishing is adequately addressed therefore remains. - In 2016, the Netherlands was considered to address all components of GES and targets for D3, as the measures addressed fishing mortality and spawning stock biomass, as well as discards and improving selectivity. There are no modified or new measures in 2022 therefore status remains the same.
D4 — Foodwebs	
Adequacy 	The adequacy for Netherlands' programmes of measures for D4 is considered **very poor**.
Strengths	- None identified.
Weaknesses	- The gap analysis and update of the current environmental status is insufficient, due to a lack of indicators. The Netherlands reports that progress towards GES will only be achieved through other descriptors (D1 and D6). - There is no reported progress in the measures from the previous cycle, and no new/updated measures for 2021. The Netherlands makes it clear that it is not in a position to create measures for D4, as it is considered as an extension of D1. D4 is not considered in its own right, therefore has not designated its own measures. - No environmental targets or measures specific to D4 have been assigned to ensure that improvement is seen.
Progress since 2016	- The 2016 technical assessment concluded that measures for D1, D4 and D6 together covered all relevant pressures. The 2022 assessment is that no progress has been made, as no new or updated measures are reported for D4 specifically.
D6 — Seafloor integrity	
Adequacy 	The adequacy for Netherlands' programmes of measures D6 is considered **very good**.
Strengths	- The gap analysis shows progress towards GES. - Two areas of weakness are successfully identified, and most of the measures successfully address these gaps. - The links between additional and updated new measures, relevant pressures and environmental targets are clear. - Clear reporting of measures implementation. - Links between new MPA measures and pressures/environmental targets are clear. - The conservation objectives behind the protected areas and whether they are Natura 2000 sites are also clear.
Weaknesses	- The justification of updated and additional measures from other initiatives and their role in the progress towards GES is not fully clear. - The measures introduced in the 2021 programme of measures directly cover only two pressures: species disturbance and species extraction, and the extent of the protected areas designated or planned to be designated is not large enough to be sufficient to reach GES.
Progress since 2016	- Progress has been made since 2016. As the condition of seabed habitats in the Dutch North Sea does not currently meet GES, changes to the measures have been made, and new measures have been introduced. - Measures reported in the 2016 programme of measures aimed to reverse the deterioration of seabed habitats and improve the quality of broad habitat types. The measures presented in the 2021 programme of measures work towards the same aims, but with more specific objectives.
D7 — Hydrographical changes	
Adequacy 	The adequacy for Netherlands' programmes of measures D7 is considered **very good**.

Strengths	- The Netherlands did not propose modified existing measures or new measures since the GES for D7 is already achieved. However, the assessment of Netherlands' RBMPs concludes that for some coastal water bodies, 'other aquatic flora' and several general physico-chemical quality elements seem insufficiently monitored and hence not used for status assessment. - The Netherlands reported in 2022 that the existing measures implemented in its programme of measures in the MSFD first cycle are sufficient to maintain GES. - The programme of measures adequately refers to actions at regional level and to measures pursuant to WFD that are applied in the coastal part of its marine zone.
Weaknesses	- It remains not clear whether pressures from activities not subject to local/project scale Environmental Impact Assessment (EIAs) (e.g., fishing, maritime transport) are considered. This gap hampers the assessment of cumulative effects. - The MSFD programmes of measures only apply to EEZ.
Progress since 2016	- The Netherlands improved its programme of measures since 2016 by explicitly including cumulative impacts and a prospective vision of future activities likely to have strong influence on hydrographical changes (D7) such as offshore windfarms and sand extraction to mitigate climate change effects.

Based on the information reported in their programmes of measures, the Netherlands' commitment to the implementation of their second programme of measures is assessed as '**medium**'.

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
No information if CBA and/or CEA was used and did not report social impacts of measures.	Reported various funding sources such as the national fund (e.g. Ministry of Infrastructure and Water Management), the Monitoring and Research Nature Strengthening and Restoration of Resources programme, and European funds (e.g. EMFAF). Planning to mobilise 88 million EUR of National funds for the period of 2022 - 2027 and 5 million EUR from EMFAF for specific MSFD measures and research.	Reported the coordination between the MSFD, WFD, MSP, CFP, and BHD in terms of how measures achieve common objectives. Authorities responsible for implementing measures are listed, but there is no information on authorities involved in coordinating policies. Coordination with neighbouring countries is done through OSPAR and EU working groups and the OSPAR action programme was considered in the development of the second programme of measures.	Where: Measures for two Descriptors (D6 and D10) provide sufficient information on spatial coverage. Measures for D1 only provide partial information, while measures for D5 and D8 do not have clear information on spatial coverage. How: Measures for D10 provide sufficient information on operationalisation. For example, details on the mode of action, responsible authorities and financing are provided. Measures for D1 only have partial information, and measures for D5 and D8 do not provide clear information on operationalisation.
			Where: Measures for two Descriptors (D6 and D10) provide sufficient information on temporal scope. Measures for D1 only provide partial information, while measures for D5 and D8 do not have clear information on temporal scope.

6.13 Poland

Summary:

Overall, the second programme of measures presented by Poland is considered to be adequate to address the pressures acting on the Polish marine environment and contributes to achieving Poland's GES and targets.

In terms of strengths, Poland carried out a good CBA/CEA for the proposed measures and used it for measure prioritisation. The impact on climate change has been adequately analysed, in particular for impacts on eurtophication, commercial fish and biodiversity. Poland participated to working groups at regional level, enhancing the transboundary nature of the Polish programme of measures. Measures for eutrophication, contaminants in seafood, litter, noise, biodiversity, food webs, seafloor integrity, commercial fish and non-indigenous species have all been assessed as adequate to address pressures.

On the downside, no information was provided on the amounts foreseen to implement the new cycle of measures and social issues do not appear to have been fully considered. Measures for contaminants and hydrographical conditions have been assessed as only moderately adequate to address pressures.

Based on the information reported in their programmes of measures, Poland's commitment to implement their second programme of measures has been assessed as 'high'.

The adequacy of Poland's programme of measures for **cross-cutting issues** is considered **good**.

Poland followed the MSFD reporting guidelines and provided all required information. However, some information was missing, particularly regarding how social issues had been considered when developing the programme of measures, and mechanisms and outcomes of coordination with other EU policies/legislations. Poland's updated programme of measures did not have major changes since the first cycle in terms of methods applied for measures selection, regional and international cooperation, and public consultation.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The measures selection process involved a gap analysis, followed by proposing measures to reduce the gap. A Cost-Effectiveness Analysis and Cost-Benefits Analysis were undertaken to evaluate the associated costs and benefits of the proposed measures. Poland defined a methodology to select high-priority measures to put in place and decision-making follow-up processes.	Concerning social issues, Poland does not present any indication of social issues considered and no social assessment was carried out to support the development of programme of measures.
 **Interactions with climate change**	The impact of climate change on the efficacy of protective measures for certain descriptors (D5, D3, and D1) has been accounted for.	Poland does not provide additional information on the impact of climate change and on (i) the potential impact of measures on GHG emissions, (ii) whether the measures were part of a climate change adaptation strategy and their adaptability, and (iii) whether the proposed measures contribute to preserving ecosystem services and socio-economic activities.

		Likewise, in its 3rd RBMP reporting under WFD, Poland provides limited information on the impacts of climate change on water management, and some measures are indicated to be adaptation measures.
Links to other policies	Links with other EU policies/legislations, namely WFD, CFP, MSP, and BHD were explored and mentioned in the reporting.	No additional information on the mechanisms and outcomes of cooperation was provided, making it difficult to understand how coordination was done and what the synergies and outcomes of such cooperation on the final list of measures were. While the funding sources were clearly listed and the process of allocating funds was explained, there was no further information on the specific amounts mobilized from each source. This information could have provided better insights into priorities and targeted sectors/descriptors.
Regional cooperation and transboundary impact	Regional coordination was carried out through HELCOM, where PL actively participated in different working groups. Poland's updated programme of measures was largely a result of coordinated regional efforts. Poland used the regional database and discussions with neighbouring countries to update the programme of measures.	Poland did not mention any communication with neighbouring countries on transboundary impacts.
Public consultation and administrative process	Thanks to public consultation, participants had the chance to send feedback through different ways: online questionnaire, email, etc. The consultation was widely promoted through press briefings, online conferences, intensive information and promotion campaign. The public consultation process had an important impact on the final list of measures. Poland provided information on the implementation of the programme of measures and on the responsible and competent authorities in charge of coordination and implementation of measures	The assessment of Poland's 3rd RBMPs highlighted that no joint consultation with the RBMP had been carried out.

The adequacy of Poland's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5- Eutrophication

Adequacy		The adequacy of Poland's programme of measures for D5 is considered **good**
Strengths		- Poland has identified a number of measures from other relevant frameworks, in particular WFD or National Emissions Ceiling Directive, in its reporting and quantified the contribution that existing measures collectively make towards GES. - Poland has presented a detailed gap analysis for D5. - Additional measures have been identified that would enable Poland to take the actions necessary (in co-operation with other countries) to achieve GES but these measures have not yet been adopted. The implementation of this measures will be of particular importance in coastal water as the assessment of Poland's RBMPs points out that none of the coastal water bodies reach good ecological status. - Poland has provided some of the necessary information on where, when, and how the specific additional new measures will be implemented. - The programme of measures includes headline target which establish a direction of change relative to baseline and linked to a reduction in pressure.
Weaknesses		- Four first cycle measures have been withdrawn but specific reasons for withdrawing the measures have not been provided. - The additional MSFD specific measures are considered to be partially linked to operational targets as the targets are a repetition of the GES determination. - There is a general lack of detail around the specific location and timing of implementation and the extent to which funding has been secured. - The measures adopted they would be insufficient to achieve GES.
Progress since 2016		- The adequacy of Poland's report on D5 in the second programme of measures remains the same as in the 2016 assessment. No progress has been made. - In 2016, the assessment considered that coverage of pressures had been partially addressed. The 2022 assessment considers that coverage of relevant pressures had been partially addressed. - In 2016, the assessment considered that the measures partially covered the components of GES and targets. In 2022, the assessment considered that the measures partially covered the components of GES and targets.
D8-Contaminants		
Adequacy		The adequacy of Poland's programme of measures for D8 is considered **moderate**
Strengths		- The updated measures concern contaminants and are related to WFD measures. - Poland has presented a gap analysis for specific substances not currently achieving GES for D8. - The update of the programme of measures clearly sets out the range of pressures. - Poland has provided some of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses		- The gap analysis cannot be considered fully complete as it is unclear how the baseline to inform the gap analysis has taken account of future development activity, it does not appear that different scenarios have been considered in the analysis, and it is not clear whether socio-economics and climate change have been taken into account in the gap analysis. - Poland has identified a number of updated of measures from other relevant framework in its reporting but has not quantified the contribution that existing measures collectively make toward GES. - Four measures from other relevant framework have been withdrawn but specific reasons for withdrawing the measures have not been provided. - The additional MSFD specific measures are considered to partially represent actions to achieve operational targets as while the actions are linked to operational targets, the actions will be insufficient to achieve GES.

	- While the measures adopted in the second cycle addressed some of the key pressures, some important pressures are not effectively addressed. In particular, coal combustion and heavy industry are identified as key sources of heavy metal contaminants, but additional measures are currently only linked to improved knowledge of contaminant sources rather than reduction of the pressures. This is consistent with the the assessment of Poland's RBMPs which highlights that Poland should take all necessary measures to prevent the emissions of polyaromatic hydrocarbons (PAHs), mercury, polybrominated diphenyl ethers (PBDEs), hexabromocyclododecane, heptachlor and heptachlor epoxide, and perfluorooctane sulphonic acid (PFOS). - There is a general lack of detail around specific locations and timing of implementation and the extent to which funding has been secured. - Neither the National Emissions Ceiling Directive (2016/2284/EU) nor the 2021 update to the Baltic Sea Action Plan or the Zero Pollution targets are mentioned.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures had been partially addressed. - In 2016, the assessment considered that the measures address both GES and targets. In 2022, the assessment considered that the measures partially covered the components of GES and targets.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Poland's programme of measures for D9 is considered very good
Strengths	- Poland has presented a gap analysis for specific substances of concern relevant to Regulation 1881/2006. The gap analysis indicates that GES is and will continue to be achieved for all substances except PBDE. - Measures from other relevant framework will help to contribute to the continued reduction in other substances of concern (particularly mercury and lead) and provide confidence that the reduction targets and GES for these substances will be met. - The gap analysis gives a clear overview of the current state of the descriptor, as well as highlights several possible contaminants which may threaten the achievement of GES (mercury and lead levels). - Some measures may provide additional knowledge that could lead to measures to further reduce heavy metal inputs. - The additional MSFD specific measures are considered to sufficiently represent actions to achieve operational targets as the actions are linked to operational targets which focus on pressure reduction. - Poland has provided some of the necessary information on where, when, and how the specific additional MSFD specific measures will be implemented.
Weaknesses	- Poland has not clearly explained how the updated existing measures contribute to GES. - It is not clear whether alternative scenarios, the socio-economic impacts and climate change have been adequately taken into account in the gap analysis. - There is a general lack of detail around the timing of implementation and the extent to which funding has been secured.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, the assessment also considers that coverage of relevant pressures had been sufficiently addressed. - In 2016, it was considered that the measures address both GES and targets. In 2022, the assessment also considered that the measures covered the components of GES and targets as alongside measures from other frameworks could contribute to pressure reduction.
D10 — Marine litter	

Adequacy		The adequacy of Poland's programme of measures for D10 is considered **good**.
Strengths		- Poland has linked existing measures to the updated River Basin Management Plans for the Oder and Vistula River. - A clear gap analysis is provided for criterion D10C1 (macro-litter) on beaches. - Information on the spatial and temporal scope, as well as the implementation mechanisms of the MSFD specific measures is complete. - A timeline for achieving GES by 2027 is anticipated by Poland in its second programme of measures. - Recent EU-level developments, such as EU Zero Pollution Action plan, are referenced in the text
Weaknesses		- Poland fails to explain how the modifications to the measures from other frameworks will contribute to GES for D10. - A fully quantitative gap analysis is lacking for the remainder of elements under D10C1, as well as for the other criteria D10C2, D10C3 and D10C4. - Individual contribution of measures towards GES is not assessed for any of the criteria. - Recent EU-level developments are not translated into modified existing measures.
Progress since 2016		- Poland's second programme of measure has not deteriorated compared to the previous assessment cycle and even improved on some aspects. - Regarding pressures, in 2016, the assessment stated that the measures reported by Poland addressed the main pressures related to litter input, which is still the case in 2022. - While the 2016 reporting on the 1st cycle programme of measures lacked clear indications of timelines for the different measures, the 2nd cycle programme of measures manage to include timing of implementation for the additional and modified MSFD specific measures.
D11 — Underwater noise and energy		
Adequacy		The adequacy of Poland's programme of measures for D11 is considered **very good**
Strengths		- The gap analysis provided in relation to D11 is considered adequate. - Poland presents all recent policy developments relevant to the management of underwater noise and refers to the HELCOM Guidelines for continuous noise monitoring. - Poland identifies the key pressures and related activities. - Poland explains how future socio-economic developments are taken into account to determine future environmental pressures. - Both continuous and impulsive noise are addressed by the modified and additional MSFD specific measures in the second cycle, covering different main sources as well as affected species groups. - Poland specifies that the thresholds recommended by the EU Expert Group TG Noise in 2018 on impulsive underwater noise will be considered the basis for monitoring activities. - Measures are also linked to D1 and D4 targets which is appropriate considering they are focused on the reduction of the pressure affecting specific marine mammals and restoring a species or habitats. - Poland provides adequate information regarding the spatial and temporal scope of the measures as on the implementation of the measures.
Weaknesses		- One MSFD specific measure from the first cycle was withdrawn; the justification provided refers to cost-effectiveness, however, no further details are provided. - Of the six modified and additional MSFD specific measures, only one is linked to the operational targets defined for D11. - Some information is lacking regarding the funding source and indicators for some of the measures.

Progress since 2016	- Poland has improved its programme of measures for the 2nd cycle. - Poland was assessed as partially addressing pressures and partially addressing GES and targets in 2016. For the second cycle, Poland has defined measures that directly address the pressures and thus also directly contributing to achieving GES for D11.

The adequacy of Poland's programme of measures to address **biodiversity** issues is considered **good.**

Biodiversity

D1 — Biodiversity	
Adequacy 	The adequacy of Poland's programme of measures s for D1 is considered good
Strengths	- The programme of measures describes how river basin management plans have been revised, providing a reason for update of the D1 specific measure. - The programme of measures is based on a good gap analysis: the analysis provides details of whether existing measures are sufficient to reach GES, based on a series of indicators, and knowledge gaps are also identified. - The withdrawal of measures is adequately justified. - Timescales for delivery of measures are fully presented. - No specific measures relating to the designation of new marine protected areas are reported.
Weaknesses	- The gap analysis does not provide an assessment of the impacts of pressures from human activities. - The additional MSFD specific measures partially address the relevant pressures for D1-biodiversity and only partially contribute to meeting operational targets. - Some issues identified in the gap analysis, for example around indicators linked to seal reproduction, or the large fish index, have relevant targets, but no associated measures. - Where and how additional MSFD specific measures will be implemented is only partially explained.
Progress since 2016	- Information on the assessment of D1-biodiversty in 2016 is not available, so no comparison can be made. - Poland should link the gap analysis with the development of MSFD specific measures more clearly to ensure that gaps are filled and progress to GES is not limited.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Poland's programme of measures for D2 is considered very good
Strengths	- The gap analysis is comprehensive and identified key pathways of introduction of NIS to Polish waters and the Baltic Sea and assessed recent introductions against an appropriate baseline. - The gap analysis identified potential future pressures relating to the spread and introduction of NIS. - All modified and additional MSFD specific measures address relevant pressures relating to D2 and those identified in the gap analysis. - The MSFD specific measures are considered to address the operational target. - Information on when, where and how the new measures will be implemented are adequately detailed, particularly in the measure descriptions.
Weaknesses	- No details are provided on why a measure from the 1st cycle was withdrawn. - Not all targets relating to D2 are considered to be operational.
Progress since 2016	- The adequacy of Poland's report for D2 in the second programme of measures remained similar to the 2016 assessment as the measures well address both pressures and targets.

	- In both the 2016 and 2022 assessments, it was considered that the measures are adequately addressing the relevant pressure relating to limiting the introduction and spread of NIS. - In addition, Poland's measures in both 2016 and 2022 address GES and relevant operational targets.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Poland's programme of measures for D3 is considered good
Strengths	- The programme of measures includes an extensive section on existing management instruments and action plans relevant to D3. - Poland has provided a gap analysis that adequately identifies all significant gaps to achieve GES for D3. - Poland reports measures which are considered to partially address all relevant pressures as they mostly focus on reducing eutrophication pressures but Poland justified this choice. - Poland has explained where and when the additional MSFD specific measures will be implemented, and explained how they will be implemented. - Information is provided on the relevant policies and regulations for implementation, the responsible organisation and sources of funding.
Weaknesses	- Recreational fishing, and extraction of seaweed and other sea-based food harvesting, were identified in the first cycle programme of measures as potentially not being adequately addressed; the modified and additional new measures do not address these areas. - Most of the modified and additional new measures are focused on reducing nutrient inputs, rather than directly focusing on D3 issues and targets.
Progress since 2016	- The adequacy of Poland's report on D3 in the second programme of measures remains the same as in the 2016 assessment. No progress has been made. - In 2016, Poland's programme of measures was considered to partially address relevant activities causing the pressure 'extraction of species'. In relation to GES and targets, the programme of measures was considered to partially address relevant aspects. - In 2022, the updated programme of measures was considered to continue to partially address relevant pressures, as the aspects identified as missing or not clearly addressed in the first cycle programme of measures continue to not be addressed in the updated programme of measures.
D4 — Foodwebs	
Adequacy 	The adequacy of Poland's programme of measures for D4 is considered good
Strengths	- The programme of measures is based on a good gap analysis. In particular, the analysis also considers future scenarios, taking socio-economic factors into account. - The analysis provided details of whether measures are sufficient to reach GES, based on a series of indicators, and knowledge gaps are also identified. - Poland reports a wide range of targets as being relevant to the new and additional updated measures. - The programme of measures includes several measures focused on improving the protection offered by existing sites, both by strengthening broader MPA management and addressing specific issues related to disturbance of marine mammals in MPAs.
Weaknesses	- The gap analysis does not provide an assessment of the impacts of pressures from human activities. - The additional MSFD measures only partially address the relevant pressures for D4-food webs. - One group of measures are assessed as only indirectly addressing pressures, with no clear link to food web stability. - Only one target is addressed by additional and modified MSFD specific measures.

	- Where and how additional and modified new measures will be implemented is only partially explained.
Progress since 2016	- Information on the assessment of D4-food webs in 2016 is not available, so no comparison can be made.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Poland's programme of measures for D6 is considered good
Strengths	- The programme of measures is based on a good gap analysis. The analysis provides details of whether existing measures are sufficient to reach GES, based on a series of indicators, and knowledge gaps are also identified. - The gap analysis provides details for all five criteria under which GES for D6 are assessed. - Poland reports a wide range of targets as being relevant to the new and additional updated measures. - Direct measures are listed under D1, but Poland makes a clear link to D6. These include several that will address the pressure on seabed habitats from bottom dredging. - The additional MSFD specific measures address relevant pressures which pose a threat to the health of benthic habitats and contribute to meet operational targets. - Timescales for delivery of measures are fully reported. - Several measures are focused on improving the protection offered by existing sites, both by strengthening broader MPA management and addressing specific issues related to disturbance of marine mammals in MPAs.
Weaknesses	- The gap analysis does not provide an assessment of the impacts of pressures from human activities. - According to the gap analysis, pressure from bottom-towed fishing gear is a barrier to achieving GES. The withdrawal of a measure linked to reducing this pressure is surprising although Poland has introduced two new additional and updated measures with similar purposes to replace it. - Given the range of targets reported under D6, it could also be argued that more measures may be required to ensure that they are met. Given the gap analysis concludes that none of the D6 criteria meet GES, more action may be required to move in the right direction and reduce limitations to progress. - Where and how additional and modified new measures will be implemented is only partially explained.
Progress since 2016	- Information on the assessment of D6-seabed in 2016 is not available, so no comparison can be made. - For real progress to be made towards GES for D6, more attention must be paid to the largest threats to seabed health, such as physical disturbance and loss, which are caused by human activities such as trawling, which can be restricted.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Poland's programme of measures for D7 is considered moderate
Strengths	- Poland presented an extensive analysis of scenarios for future maritime and terrestrial human activities and of their consequences on the evolution of pressures on the marine environment. - The measures are adequately described and clearly linked to the limitation of pressures and WFD
Weaknesses	- While Poland considers that the main future pressures in its waters will be linked to the development of offshore wind farms, the programme of measures mainly focuses on limiting pressures in coastal areas and no measure seems to address the development of offshore windfarms. - Poland's gap analysis is partially adequate in identifying all significant gaps to achieve GES for D7.

	- No information is provided about the link with work done at regional level on actions related to this descriptor, except a general reference to HELCOM. - The measures are not adequately linked to measurable and operational environmental targets thus it remains unclear how they will contribute to achieve GES. - Some activities are still not addressed such as waste disposal, shipping and tourism, except for the restrictions of tourist infrastructure in Natura 2000 zones. - Spatial management measures that could locally lead to limitations of pressures linked to D7 are planned but not described in detail.
Progress since 2016	- The adequacy of Poland's report on D7 in the second cycle remains the same as in the 2016 assessment. - Poland's programme of measures has not progressed on the coverage or pressures or the coverage of GES and targets. - Cumulative impacts are only partially addressed in 2022, through the measure on guidelines for conducting environmental impact assessments for projects involving the exploration and extraction of minerals.

Based on the information reported in their programmes of measures, Poland's commitment to the implementation of their second programmes of measures is assessed as "**high**".

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
41 new measures subject to CEA and CBA, and results influenced measure prioritisation. Did not refer to social issues investigated.	Reported the mobilisation of national funds (e.g. state funds, national fund for environmental protection and water management, etc.), private funding (own resources of farms), and European funds (e.g. EMFAF, European infrastructure funds). Did not provide further information on the specific amounts mobilized from each source	Links and importance of coordination between the MSFD and other EU policies, notably the WFD, CFP, MSP and HBD were presented. Exchange of information between both MSFD and WFD authorities during the implementation and monitoring of both Programme of Measures was mentioned. Regional coordination is done through HELCOM at the ministerial level and regular meetings for various working groups. Specific to the MSFD, Poland is part of HELCOM working groups dedicated to the implementation of the Marine Strategy focusing on three key areas: Good Environmental Status, Socio-Economic Analysis, and Information and Data exchange.	Where: Measures for seven Descriptors (D2, D3, D5, D8, D9, D10, D11) have sufficient information on spatial coverage, while measures for four Descriptors (D1, D4, D6, D7) have partial information. How: Measures for four Descriptors (D2, D3, D7, D9) have sufficient information on operationalisation, while measures for seven Descriptors (D1, D4, D5, D6, D8, D9) only have partial information. When: Measures for seven Descriptors (D2, D3, D4, D6, D7, D10, D11) have sufficient information on temporal coverage. Additional and modified new measures are reported to have started in 2022 will continue until 2025-2027. Measures for four Descriptors (D1, D5, D8 and

			D9) only have partial information on temporal coverage.

6.14 Portugal

Summary:

Overall, the second programme of measures presented by Portugal is considered as not adequate to address the pressures acting on the Portuguese marine environment.

In terms of strengths, Portugal's measures are designed to enhance the resilience of marine ecosystems as part of an integrated response to the overall climate change issues. Regional cooperation is addressed via OSPAR and Portugal undertook regional/ subregional coordination of measures with France and Spain specifically. Funding sources are all clearly identified.

On the downside, the absence of detailed gap analyses for all of the descriptors makes it very difficult to assess the appropriateness of the new measures presented by Portugal. There is also no clear description of coordination mechanisms across different authorities for the implementation of measures stemming across different policy/sectoral areas (e.g. environment/ fisheries). No descriptor was considered to be covered by adequate new measures, although measures for litter, eutrophication, noise, biodiversity, food webs, hydrographical conditions and non-indigenous species have been assessed as moderately adequate to address pressures.

Based on the information reported in their programmes of measures, Portugal's commitment to the implementation of their second programmes of measures has been assessed as "high".

The adequacy of Portugal's programme of measures for **cross-cutting issues** is considered **moderate**.

Portugal's updated programme of measures witnessed minor changes since 2016. Portugal provided the information requested in the MSFD reporting guidelines; however, some information that would have allowed for better understanding are still missing, specifically regarding outcomes of methodologies, climate change considerations, coordination between the different policies, etc. Additional information could have allowed a better understanding of the programme of measures, and, eventually, a higher assessment score.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The selection of the measures relies on a four steps approach defined by Portugal and clearly described in the programme of measures.	Only one measure was subject to a Cost Effectiveness Analysis Portugal does not present any indication of social issues and analysis to support the development of the programme of measures.
	The programme of measures includes measures designed to enhance the resilience of marine ecosystems and are part of an integrated response to the overall climate change issues.	Portugal does not provide information on (a) the contribution of measures in reducing GHG, (b) the adaptive capacity of the measures, and (c) whether the proposed

Interactions with climate change		measures help preserving ecosystem and socio-economic activities
Links to other policies	Portugal takes into consideration the different measures carried out under other EU policies, notably WFD, CFP, BHD, and MSP while updating the programme of measures	Portugal does not provide additional information explaining mechanisms of coordination between the different directives and policies, and more importantly on the outcomes of such coordination.
Regional cooperation and transboundary impact	Regional cooperation was carried out on two levels. On regional level through OSPAR Convention. Portugal adopted the Environmental Strategy for the Protection of the North-East Atlantic and participated in the technical and coordination groups of OSPAR. Trilateral meetings were organised with France and Spain in order to adopt measures of a cross-border nature (e.g. management of MPAs, marine litter, etc.)	No information was provided the assessment on the transboundary impacts of measures.
Public consultation and administrative process	Portugal carried out public consultation at regional and national levels. The methodology that aimed to incorporate the views of the different stakeholders into the final programme of measures is presented. Information on the different competent/responsible authorities in charge of implementing and coordinating the implementation of the programme of measures as the information regarding the stakeholder process, the organisation of specific consultation and raising awareness activities are provided.	The level of information was not sufficient to understand the implementation process and the monitoring and measures' follow-up actions.

The adequacy of Portugal's programme of measures to address **pollution** issues is considered **poor.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Portugal's programme of measures for D5 is considered moderate.
Strengths		- Portugal has identified some updates to existing measures, including measures linked to the WFD reporting. - Portugal presents an operational target referring to a reduction in the level of pressure for Macaronesia.
Weaknesses		- No information is presented on progress towards GES, although it is noted that GES is reported as achieved under Article 8. - Portugal relies mainly on existing measures to maintain GES for D5. However, there are notable gaps and some inconsistencies in the reporting and there is no information on how updated existing measures contribute to the maintainance of GES.

	- Portugal has not presented a detailed gap analysis and it is unclear whether all significant gaps to achieve MSFD targets and GES have been identified.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been partially addressed and that the measures partially addressed the components of GES and targets. - In 2022, the assessment considers that coverage of relevant pressures and of the components of GES and targets was not relevant as no modified or additional MSFD specific measures specific to D5 have been identified.
D8-Contaminants	
Adequacy 	The adequacy of Portugal's programme of measures for D8 is considered poor
Strengths	- Portugal has undertaken a gap analysis to identify where additional measures might be required to address pressures.
Weaknesses	- There are notable gaps and some inconsistencies between e-reporting and the text reports. - The gap analysis is only qualitative and not quantitative. - Portugal has not provided information on how updated existing measures contribute to the achievement of GES. - There is no reference to the Zero Pollution targets and to the updates of the National Emissions Ceiling Directive.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures and the components of GES and targets had been partially addressed. As no modified/ additional MSFD specific measures specific to D8 have been identified, in 2022, the coverage assessment of relevant pressures and of the components of GES and targets is not performed. - The gaps identified in 2016 remain.
D9 — Contaminants in seafood	
Adequacy 	- The adequacy of Portugal's programme of measures for D9 is considered poor
Strengths	- Portugal has undertaken a gap analysis to identify where additional measures might be required to address pressures.
Weaknesses	- There are notable gaps and some inconsistencies between the e-reporting and the text reports. - The gap analysis is only qualitative and not quantitative. - There are no links between relevant measures for D8 and D9. - Portugal has not provided information on how updated existing measures contribute to the achievement of GES. - There is no reference to the Zero Pollution targets and to the update of the National Emissions Ceiling Directive. - The summary report does not mention why the measure has been withdrawn.
Progress since 2016	- In 2016 the assessment considered that coverage of pressures had been partially addressed. In 2022, as no modified or additional MSFD specific measures specific to D9 have been identified the assessment of the progress is not possible. - In 2016, it was considered that the measures partially addressed the components of GES and targets. In 2022, the assessment considered that the coverage of the components of GES and targets was not relevant as no modified or additional MSFD specific measures specific to D9 have been identified.
D10 — Marine litter	
Adequacy 	The adequacy of Portugal's programme of measures for D10 is considered moderate
Strengths	- Portugal referred in its programme of measures to the EU Port Reception Facilities and the Common Fisheries Policy for sea-based litter. - Portugal describes the methodology for selecting additional MSFD specific measures in its programme of measures.

	- Reference is made to the OSPAR Regional Action Plan for Marine Litter - Adequate detail is provided on how, when and where the new measures will be implemented.
Weaknesses	- There is no gap analysis reported for D10, so it remains unclear what the current status of marine litter is, what the contribution of the first cycle measures to achieving GES is, and where the main gaps are situated and how the second programme of measures aims to address all those aspects. - Several of the new targets set forward by Portugal to achieve GES for D10 are not supported by new measures. - The additional MSFD specific measures are only indirectly aiming to prevent further litter input in the marine environment, so it remains unclear how GES is expected to be achieved through these measures. - Recent EU-level developments such as the Zero Pollution Action Plan and the EU beach litter threshold are not included in the programme of measures.
Progress since 2016	- In 2016, Portugal was considered to partially address the relevant pressures and activities related to D10, which is still the case in the 2022 reporting. - In 2016, the measures partially addressed GES and targets. This remains largely the same in the 2022 reporting, - Similar as in 2016, Portugal includes clear timelines for the new measures in its second programme of measures but fails to report when GES will be achieved.

D11 — Underwater noise and energy		
Adequacy		The adequacy of Portugal's programme of measures for D11 is considered moderate
Strengths		- Portugal refers to the work of OSPAR and the North East Atlantic Environmental Strategy 2020-2030, the methodology proposed by the Commission's Technical Group on Noise. - The additional MSFD specific measure will aim at directly reducing existing levels of the pressure in the marine environment and improve knowledge base. - The regional project "Jonas – Joint Framework for Ocean Noise in Atlantic Seas", which developed an approach to assess the risks of acoustic pressures on marine biodiversity and to improve ocean noise monitoring is mentioned in the programme of measures.
Weaknesses		- No gap analysis is provided and there is no information on the baseline, the current status, the contribution of the first cycle measures to achieve GES for D11. - No measure is implemented in the Madeira area. - The programme of measures is lacking any active measures addressing impulsive noise.
Progress since 2016		- No progress in Portugal's programme of measures has been identified since 2016. - In 2016, Portugal was considered to partially address the pressures relevant to D11, the GES determination and targets. In the second cycle, the same gaps remain.

The adequacy of Portugal's programme of measures to address **biodiversity** issues is considered **poor.**

Biodiversity

D1 — Biodiversity		
Adequacy		The adequacy of Portugal's programme of measures for D1 is considered moderate
Strengths		- All additional measures from other initiatives are well reported, and Portugal provides details on their objectives and how they will contribute to GES. - The reason for withdrawing one of the two measures is well explained. - A good amount of information is provided on each measure in both the e-reporting and the text report.

	- The measures are assessed to directly address relevant pressures, as well as directly covering operational environmental targets. - The implementation of the measures is well described: where and when the measures will be implemented, and the location to a detailed scale is included for the measure linked to the implementation of MPAs.
Weaknesses	- The gap analysis is very poor as the programme of measures only provides the method used to determine new measures. There is no information reported on any gaps to progress to GES or on the current environmental status for any of the six biodiversity species groups. - The justification for the updating of existing measures and the introduction of additional measures from other initiatives is partially adequate. - Two measures are focused on the acquisition of knowledge, and do not directly address relevant pressures or targets. Their benefit, although recognised, is envisaged on a long-term basis as they will not likely lead to the achievement of GES within the MSFD timeframe. - Details are missing with regard of the MPA measures: how it will be implemented, which human activities will be restricted. The conservation objectives of these proposed MPAs could also be made clearer providing details on the species and habitats which are to be protected. - The new updated and additional measures introduced in the second programme of measures are unlikely to allow Portugal to achieve GES within the MSFD timeframe.
Progress since 2016	- The progress made between the first and the second programme of measures is difficult to assess due to the lack of gap analysis but it seems that no progress is made as new measures introduced in the programme of measures do not cover the gaps identified in the previous assessment.
D2 — Non-indigenous species	
Adequacy 	- The adequacy of Portugal's programme of measures for D2 is considered moderate
Strengths	- The cross-cutting modified existing measure reported by Portugal has the potential to indirectly reduce the pressures relating to D2. - Several new targets to achieve GES have been set for the second programme of measures. - Adequate details are provided on how, when and where the new measures will be implemented.
Weaknesses	- The method behind selecting new measures is thoroughly described in the programme of measures, - No gap analysis is provided so the programme of measures does not include information related to the baseline or the contribution of the first cycle measures to achieving GES for D2C1. - No pathways of NIS introduction, which require to be addressed, were identified in a gap analysis. - Some modified new measures aim to increase knowledge and monitoring of the introduction and impact of NIS in Portugal's waters. However, they will not directly reduce the pressures relating to D2. - No measures specifically address the pathways of introduction.
Progress since 2016	- In 2016, Portugal was considered to not address the pressures relevant to D2 with the identified measures. In 2022, there are still no measures which address specific pathways; the measures aim to increase knowledge base. - In 2016, Portugal was considered to partially address GES determination and targets. In 2022, new targets have been set for each sub-region, however, the measures only partially cover the targets. It is unclear how GES will be achieved/maintained since not all targets were linked to the new measures.

D3 — Commercial fish and shellfish	
Adequacy	 The adequacy of Portugal's programme of measures for D3 is considered poor
Strengths	- The updates to existing measures are identified, including to the Common Fisheries Policy, the EduMar programme, and a number of measures are withdrawn or merged into the CFP measure. - The overall approach for defining the second cycle of measures is presented. - Portugal has withdrawn one new measure from the first cycle and has provided an adequate justification.
Weaknesses	- Portugal does not provide a clear gap analysis for D3 in its second cycle. - The programme of measures does not detail the specific gaps relating to D3. - Portugal does not provide any baseline, information on progress to GES or environmental targets. - One modified new measure is considered to be a generic/cross-cutting measure and not specifically focused on achieving GES for D3.
Progress since 2016	- In 2016, Portugal's report was considered to adequately address relevant pressures. The programme of measures was considered to partially address GES and targets. - In 2022, no modified or additional MSFD specific measures were reported that were specific to D3. As one existing measure is withdrawn it is not clear whether pressures will continue to be adequately addressed.
D4 — Foodwebs	
Adequacy	 The adequacy of Portugal's programme of measures for D4 is considered moderate
Strengths	- The programme of measures presents a flow chart of the process undertaken to determine the need for new measures, - The justification for the withdrawal of one measure under D4 is clear. - Reporting on the practicalities of the measures is a stronger point in the programme of measures. Details of when and where the measure will be implemented are provided. - Portugal includes a list of possible locations for the proposed MPAs where habitats of importance have been identified.
Weaknesses	- The explanation of updates made to existing measures is inadequate. It is not clear how the measure has been updated, and how the update will help progress towards GES for D4. - The gap analysis is also considered inadequate, with most of the requested information not provided. - The lack of gap analysis limits the ability of any of the measures which have been proposed in the programme of measures to make real progress towards GES. - There is no update on the current environmental status, on the progress towards targets and on the gaps identified. - The measure is focused on spatial protection and could be described as more suitable for D1 than D4, which requires more specific measures to focus on threatened trophic levels. - Portugal does not provide enough details on the activities to be managed/restricted or on the species and habitats to be protected. - The lack of quantification of the size of the planned MPAs and the size of the target for protected areas increases the difficulty in monitoring progress towards GES. - Information on how the measure will be implemented is not complete.
Progress since 2016	- It is difficult to determine overall progress since the first cycle. - No improvement has been made as no gap analysis has been performed for D4, meaning that the ability of measures to help progress towards GES is limited.
D6 — Seafloor integrity	

Adequacy		The adequacy of Portugal's programme of measures for D6 is considered **poor**
Strengths		- The reason for the introduction of new measures is well justified in the programme of measures. - The practicalities of the new updated and additional measures are adequately presented by Portugal. - Portugal provides detailed information on the measures regarding the specific locations where the actions will take place, as well as when and how the measure will be implemented.
Weaknesses		- A gap analysis is not provided, only a designation of new measures is briefly mentioned. The justification on the updates to the modified existing measure is not provided. Therefore, Portugal does not justify why these updates will help improve the measure and to contribute towards achieving GES. - Given the lack of data on benthic communities across Portuguese waters, the removal of the associated measure is not justified in the programme of measures. - The links between new updated and additional measures, and pressures and environmental targets are considered inadequate. - No relevant pressures for D6 are reported in the programme of measures. - All the new updated and additional measures reported under D6 focus on knowledge acquisition and will therefore not have short-term and immediate positive impacts on threats such as biological and physical loss and disturbance. - The measures reported will be implemented on a small scale, for the most part, which will limit their contribution to GES further.
Progress since 2016		- Little progress has been made under D6. - In 2016, it was considered that the measures under D6 did not adequately address the relevant pressures, and the measures only partially contributed towards the achievement of environmental targets. The same conclusions can be drawn from the assessment of the second cycle.
D7 — Hydrographical changes		
Adequacy		The adequacy of Portugal's programme of measures for D7 is considered **moderate**.
Strengths		- The overall approach for defining the second cycle of measures is presented in the text report. - Adequate detail is provided on how, when and where the modified and additional MSFD specific measures will be implemented. - Portugal partially explains how the additional MSFD specific measure will contribute to meet the operational environmental targets.
Weaknesses		- No information is presented on progress towards GES, although it is noted that GES is reported as achieved under Article 8. - The information provided for D7 is generally limited or not specific enough. - Portugal neither provides adequate assessment of existing or future pressures that could be relevant for D7, nor a clear assessment of the gaps in the first cycle programme of measures that should be addressed in the updated programme of measures. - Modified and additional MSFD specific measures reported by Portugal in its updated programme of measure for D7 do not adequately address relevant pressures as they aim at improving the knowledge base.
Progress since 2016		- In 2016, the assessment considered both coverage of pressure and coverage of GES and targets as not addressed. The gaps and weaknesses assessed in 2016 are still visible in the 2022 report as all measures, modified or additional are only focusing on the development of the knowledge base.

Based on the information reported in their programmes of measures, Portugal's commitment to the implementation of their second programme of measures is assessed as "**high**".

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when
Only one new measure subjected to CEA. Did not refer to social issues investigated.	Presented three main sources: national funds, European funds (e.g. the LIFE+ programme, Horizon 2020, EMFAF, and international funding such as JPI Oceans, EEA Grants, etc. The MS stated mobilizing 392 million EUR (for the period of 2021 - 2027) from EMFAF.	The second Programme of Measures considered different measures carried out under the WFD, MSP, CFP and HBD. Responsible/competent authorities for the implementation and coordination of the measures were presented. Coordination with neighbouring countries was done on two levels: regionally via OSPAR and trilaterally with France and Spain. Trilateral work enabled the identification of regional and national objectives which required sub-regional cooperation and transboundary measures (e.g. management of MPAs).	Where: Measures for seven Descriptors (D1, D2, D4, D6, D7, D10 and D11)[10] have sufficient information on spatial coverage. For example, the measure for D1 to study, identify, characterize and georeference marine habitats and biocenoses is applicable to the Madeira archipelago. How: Measures for four Descriptors (D2, D7, D10, D11) have sufficient information on operationalisation, while measures for three Descriptors (D1, D4, D6) have partial information. When: Measures for seven Descriptors (D1, D2, D4, D6, D7, D10 and D11)[11] have sufficient information on temporal scope.

6.15 Romania

Summary:

Overall, the second programme of measures presented by Romania is considered as not adequate to address the pressures acting on the Romanian marine environment.

In terms of strengths, Romania uses a CEA and a CBA for selecting its measures. Cooperation with neighbouring countries, especially Bulgaria, is taking place via bilateral agreements and transboundary impacts of new measures were assessed and communicated to neighbouring countries through the Black Sea Commission and the Bucharest Convention. Measures for marine litter have been assessed as adequate to address the pressures. It is also positive that in its 3rd RBMP reporting exercise under the WFD, Romania pays also attention to the objectives of the MSFD and includes those addressing e.g. aquaculture industry, preserving the morphological status of the Romanian Black Sea coast, sturgeon species (protection measures for sturgeon, preservation and restoration of ecological corridors) to mention just a few.

On the downside, Romania provides very few details regarding governance mechanisms and financing sources. Coordination between different authorities and policies and their impact on the new measures is not described. Only

measures for litter have been considered as adequate to address pressures, those for eutrophication, biodiversity, commercial fish and hydrological conditions only moderately adequate and those for contaminants and noise particularly insufficient.

Based on the information reported in their programmes of measures, Romania's commitment to the implementation of their second programme of measures has been assessed as 'medium'.

The adequacy of Romania's programme of measures for **cross-cutting issues** is considered **poor**.

The updated of the programme of measures presented little information on the process followed which makes it challenging to compare the results with the previous cycle assessment. In most cases, uncertainty existed on the methodology/results applied/reported. The updated programme of measures not in accordance with the MSFD reporting guidelines, in terms of structure to be followed and information to be reported.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The same methodology for measures' selection as the first cycle was followed for the second cycle. A Cost-Effectiveness Analysis (CEA) and a Cost-Benefit Analysis (CBA) is used for the identification of the new measures. Information on stakeholder processes and organization of specific consultation with stakeholders as well as raising awareness.	The methodology followed for CBA and CEA is not provided. The programme of measures provides information on cost categories and qualitative information on benefits only for two new measures. Uncertainty exists regarding the reason for not providing information on costs and benefits for the other 29 new measures. Romania does not present any indication of investigating specific social issues
 **Interactions with climate change**		There was no reference to climate change considerations in the programme of measures. On the contrary, Romania's 3rd RBMP has a dedicated chapter on quantitative aspects and climate change.
 **Links to other policies**	Coordination between MSFD and other EU policies, notably WFD, MSP, CFP, and BHD, is reported in the updated programme of measures. This is confirmed by the RBMP assessment which confirmed that the 3rd RBMP pays attention to the objectives of the MSFD and includes those addressing e.g. aquaculture industry, preserving the morphological status of the Romanian Black Sea coast. Other EU and international directives and policies/legislations such as EU nitrates directive, EU Biodiversity Strategy, EU EIA, Convention on Biological Diversity, and Black Sea Convention were also considered in the programme of measures.	Ambiguity on the mechanisms and outcomes of coordination between MSFD and the mentioned directives and policies exists as it was not presented nor described in the programme of measures. The programme of measures is not clear on the coordination with other EU legislations and in particular on how it impacted the measures selected. Romania does not provide any additional information on the amounts mobilized from each source (national or European), nor on the distribution of funds making it difficult to understand the relative share allocated for each sector/descriptor

Regional cooperation and transboundary impact	Cooperation with neighbouring countries is mainly taking place through Bilateral Agreements. Romania coordinated with Bulgaria for developing and implementing 16 joint measures. Transboundary impacts of new measures were assessed and communicated to neighbouring countries through the Black Sea Commission.	More precision is needed in the programme of measures on i) how views of neighbouring countries were considered in the final programme of measures, ii) key types of measures responsible for the transboundary impact, and iii) main descriptors impacted by the programme of measures.
Public consultation and administrative process	Romania provides an indication of the responsible/competent authorities for the implementation and coordination of each measure at different levels (regional, national), as well as the time frame of implementation for each measure.	Additional information on the public consultation process (aspects discussed, results of the public consultation, stakeholders' views), that allows better understanding, is still needed. On the contrary, in its RBMP, Romania detailed the consultation processes and included a chapter on public information, consultation and participation which includes the results of the public consultation. Romania does not provide a detailed description of the role of each competent authority, nor of the follow-up and monitoring of measures.

The adequacy of Romania's programme of measures to address **pollution** issues is considered **poor.**

Pollution

D5- Eutrophication	
Adequacy	- The adequacy of Romania's programme of measures for D5 is considered moderate
Strengths	- A gap analysis was undertaken. - There is a reasonable assessment of the current status and what level of nutrient reduction might be needed to achieve GES. - The effect of climate change in exacerbating eutrophication impacts is acknowledged. - A range of measures are planned to address key pressures contributing to eutrophication, agriculture, urban activities, industry, shipping and port operations as tourism and recreation.
Weaknesses	- Romania did not make an update to its programme of measures for D5 in the second cycle. - The effectiveness of the measures and how the individual measures will contribute to the achievement of GES is not presented in the programme of measures. This is of particular importance as the RBPM assessment highlighted that nutrient pollution and organic pollution are the most significant pressures affecting the highest percentage of surface water bodies. - Many of the measures are yet to be implemented.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been addressed. In 2022, there is no update to the measures, despite the gaps identified in the gap analysis. - In 2016, the assessment considered that the assessment addressed all components of GES and targets. In 2022, as no updates were made to the measures, it is impossible to assess the progress made between the two cycles.

D8-Contaminants	
Adequacy 	The adequacy of Romania's programme of measures for D8 is considered very poor
Strengths	- Romania continues to rely on the same measures from the first cycle which partially addressed the pressure and activities.
Weaknesses	- No information is provided on updates/changes to existing measures. - The assessment of the status is limited and there is no indication of specific pressures or substances of concern. - The effectiveness of existing measures is not included in the programme of measures. - Many of the measures are yet to be implemented. - There is no systematic analysis of how the individual measures will contribute to the achievement of GES.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been partially addressed. In 2022, as no modified or additional measures are identified, the progress assessment is not performed. - In 2016, the assessment considered that the assessment partially addressed all components of GES and targets. In 2022, as no modified or additional measures from other initiatives have been identified, it is impossible to assess the progress made between the two cycles.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Romania's programme of measures for D9 is considered poor.
Strengths	- GES was reported as achieved under Article 8. - The updates and changes are broadly focused on reducing contaminant pressures and will also contribute to reduce new contaminants impacting fish/shellfish (D9)
Weaknesses	- There is a limited assessment of the current status of the measures and no indication of specific pressures or substances of concern. No information is provided on updates/changes to existing measures, although there could be some relevant updates/changes to measures within RBMPs and measures required in relation to the National Emissions Ceiling Directive. - No modified and additional MSFD specific measures have been identified relevant to D9 - Many of the measures are yet to be implemented.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures had been partially addressed. In 2022, as no modified or additional MSFD specific measures have been identified, no progress assessment is reported. - In 2016, the assessment considered that the assessment partially addressed all components of GES and targets. In 2022, as no modified or additional MSFD specific measures have been identified, no progress assessment is reported.
D10 — Marine litter	
Adequacy 	The adequacy of Romania's programme of measures for D10 is considered good.
Strengths	- Romania has included a few measures for the second cycle of measures. - A brief mention of the gap analysis and the status GES for the Black Sea is provided in the programme of measures. - The reported new measures for D10 in Romania's second cycle contain the required information on how, when and where they will be implemented. - Romania uses the EU Beach Litter threshold value as adopted by MSCG in 2020 as indicator for assessing macrolitter on beaches (D10C1).
Weaknesses	- It is unclear whether some of these measures are modified from the first cycle. - The existing measures are briefly mentioned in the programme of measures.

	- The set of modified and additional MSFD specific measures tackles some but not all of the main litter sources in Romania's Black Sea. - Romania still does not include dedicated new measures in the second cycle for criteria D10C2. - No details on how the first cycle of measures contributed to the achievement of GES for marine litter. - The first cycle of measures have yet to be fully implemented. - Romania does not include dedicated new measures to address the pressures of microlitter and litter ingested by animals.
Progress since 2016	- Romania's report on D10 in the second cycle remains the same as in the first cycle. No progress has been made. - Regarding the coverage of pressures, Romania was assessed as fully addressing pressures in 2016. No further progress has been made despite a few new measures for D10 in the second cycle. - Regarding coverage of GES and targets, Romania's first cycle measures were assessed as fully addressing GES and the targets. Romania only still focuses on macrolitter (beach, seabed, water column).

D11 — Underwater noise and energy		
Adequacy		The adequacy of Romania's programme of measures for D11 is considered very poor
Strengths		- Romania continues to rely on the same measures from the first cycle which partially addressed the pressure and activities.
Weaknesses		- Romania does not report any additional MSFD specific measures. - The implementation description is very vague and lacks important details. - No gap analysis is provided for D11, GES and targets are not defined and the status assessment for D11 is not carried out. - The programme of measures is not clear on how the measures could contribute to achieving GES for D11. - It is not clear from the updated programme of measures if the measures have been successfully implemented as there is no mention of underwater noise
Progress since 2016		- Romania seems to have made little progress regarding D11. - It is not clear from the updated programme of measures if these measures have been successfully implemented. - Regarding the targets, these are not defined for D11 under Article 10, so no progress seems to have been made.

The adequacy of Romania's programme of measures to address **biodiversity** issues is considered **poor.**

Biodiversity

D1 — Biodiversity		
Adequacy		The adequacy of Romania's programme of measures for D1 is considered poor
Strengths		- Most of the additional MSFD specific measures aim to increase knowledge, monitoring and rise awareness. - The geographical scope of the measures is considered adequate. The objective, monitoring, increase knowledge and raise awareness aspects of these measures are addressed.
Weaknesses		- The gap analysis is a weakness, most requested information is not provided. - Gaps in progress towards GES and targets are not identified, which makes it almost impossible to assess if the measures reported are adequately addressing all the pressures and gaps.

	- The reporting of new measures is insufficient. The measures mainly focus on marine litter but do not mention other pressures negatively affecting biodiversity. - The implementation mechanisms are insufficiently described, lacking key details such as how much budget is mobilised for the implementation of the measures, how coordination will be carried out, and the mode of action of most of the measures. - The implementation time frame is unclear, with only one measure already implemented.
Progress since 2016	- The 2022 programme of measures presents no progress regarding the coverage of pressures. - Regarding the coverage of environmental targets and GES, the first cycle assessment considered GES and target as partially addressed by the measures. In 2022, no progress seems to be made in this regard. The modified and additional MSFD specific measures only contribute partially to the targets reported for D1.
D2 — Non-indigenous species	
Adequacy 	The adequacy of Romania's programme of measures for D2 is considered **moderate.**
Strengths	- A gap analysis is performed for D2. - New actions to be implemented under the MSFD's second cycle, building on measures established during the first cycle, have been mentioned as having the potential to address the environmental objectives not achieved in the first cycle. - These include establishing the number of newly introduced non-native species and generating a list of them to track their evolution in the future
Weaknesses	- There is little/no information on the number of introductions during the period of 2012-2017. Baseline scenario and the identification of the different pathways of introduction are not provided. - Romania has not implemented any new existing or second cycle of measures for D2. - The first cycle measures have yet to be fully implemented.
Progress since 2016	- Regarding the coverage of pressures, Romania was assessed as fully addressing pressures in 2016. Progress has not been made as no new measures were reported in the second cycle. - Regarding coverage of GES and targets, Romania's first cycle of measures was assessed as fully addressing GES and the targets. In 2022, no progress is made as the measures do not focus on reducing relevant pressures and impacts for D2.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Romania's programme of measures for D3 is considered **poor.**
Strengths	- Romania provided details on how, where and when the additional MSFD specific measures addressing marine aquaculture in the Black Sea will be implemented. - The modified and new measures do appear to be linked to an operational environmental target.
Weaknesses	- Romania has not provided information on whether their measures contribute to the achievement of GES and environmental objectives due to delays in the implementation of their first cycle. - The text report is brief and does not provide details on the results of the gap analysis. - There are discrepancies between the e-reports and the text, which results in their updated programme of measures being unclear and inadequate for several metrics.
Progress since 2016	- In 2022, coverage of pressures by modified and additional MSFD specific measures is assessed as being 'not clear'. A gap identified in the first cycle assessment was the lack of measures explicitly addressing recreational fishing, and Romania has still not explicitly addressed this aspect in their updated programme of measures. - In 2016, the programme of measures was considered to address all components of GES and targets for D3. In the second cycle, it is unclear whether improvements have been made.
D4 — Foodwebs	

Adequacy		The adequacy of Romania's programme of measures for D4 is considered **poor**
Strengths		- The practicality of the new measure is provided in the programme of measures. - The geographical scope of the presented measures is considered adequate, taking into account the aim of the D4 measures, for which adequate monitoring tools are presented.
Weaknesses		- No update of existing measures, nor withdrawn of measures is reported. No spatial protection measures are presented. - The gap analysis is not provided for descriptor 4. Gaps in progress towards GES are therefore not identified, which makes it difficult to assess if the measure reported is adequately addressing all the pressures and gaps relevant to achieve GES. - The measure identified is indirect and follow-up measures are necessary to directly address the reduction of pressures on food webs. - The implementation mechanisms are insufficiently described, lacking details such as how coordination will be carried out and the mode of action of most of the measures. - The implementation time is uncertain, as the implementation has not started yet and what will happen after 2024 remains unclear.
Progress since 2016		- The assessment of the first cycle made different conclusions for each of the species' groups covered under descriptor 4 when addressing pressures and coverage of targets but the pressures were mainly addressed. In 2022, no progress is made regarding the coverage of pressures. - In 2016, measures addressed GES and targets partially. In 2022, no progress was registered in this regard. The modified and additional MSFD specific measure is reported to be not relevant to the Descriptor 4 target. - The text report stated that only 4 of the 29 measures from the first cycle have been implemented, so progress is limited.
D6 — Seafloor integrity		
Adequacy		The adequacy of Romania's programme of measures for D6 is considered **poor**
Strengths		- Romania reported the practicalities of the new measures. - The geographical scope of the measures is considered partially adequate, as there is no further indication of the areas, habitats, or species to be monitored.
Weaknesses		- This descriptor does not assign its own targets and is assessed under descriptor 1. - No update of existing measures and no spatial protection measures are presented. - Gaps in progress towards GES are not identified, which makes it difficult to assess if the measure reported is adequately addressing all the pressures and gaps relevant to achieve GES. - The measure does not address relevant pressures for D6 directly but focus on monitoring, therefore follow-up measures are necessary to directly address the reduction of pressures and ensure sea-floor integrity. - The implementation mechanisms are insufficiently described, lacking key details such as how coordination will be carried out and the mode of action of the measure. - The implementation time frame is uncertain, as the implementation has not started yet and what will happen after 2024 is not clear.
Progress since 2016		- It is difficult to assess whether any progress has been made since 2016 as not enough detail is provided. - However, it is stated that only 4 of the 29 measures from the first cycle have been implemented, so progress is limited. There is also only one new measure under descriptor 6.
D7 — Hydrographical changes		
Adequacy		The adequacy of Romania's programme of measures for D7 is considered **poor**

Strengths	- Spatial information on the measures is clear and appropriate, and the organisation in charge of implementing is specified.
Weaknesses	- Romania has neither assessed the status of its waters for D7, nor the gaps to achieve GES or the environmental target. - One of the additional MSFD specific measures reported by Romania is relevant to D7 but not listed as relevant for D7. - Romania provides partial information regarding the implementation details for the measures. - No clear forward-looking plan is presented for the measures which have not started yet.
Progress since 2016	- The first cycle programme of measures was considered adequate for D7. No positive progress has been made between the first cycle and the second cycle even if one additional MSFD specific measure was defined, which appears to be addressing relevant pressure.

Based on the information reported in their programmes of measures, Romania's commitment to the implementation of their second programmes of measures is assessed as "**medium**".

Key Factor 1: Socio-economic impacts of new measures	**Key Factor 2: Financing sources and use of EU funds**	**Key Factor 3: Coordination with EU policies and regional coordination**	**Key Factor 4: Implementing modified and additional MSFD measures: where, how and when**
CBA and CEA of all new measures but only presented results for two measures so not clear how process influenced measure selection or prioritisation. Did not refer to social impacts of measures investigated.	Presented different financing sources from national and European (e.g. Horizon 2020, LIFE Programme, EMFAF, Operational Programme for Large Infrastructure) funds. No additional information on the amounts that will be mobilised from each fund.	Presented links of measures with the WFD, MSP, CFP and HBD. Mentioned that measures implemented under other EU directives, notably WFD and HBD, were considered as "existing measures" relevant for achieving GES. Coordination was done bilaterally with Bulgaria and via the Bucharest Convention. Coordination with Bulgaria resulted in the development and implementation of 16 joint measures, but no additional information on this was provided.	Where: Measures for four Descriptors (D1, D3, D7, D10) have sufficient information on spatial coverage, while measures for two Descriptors (D4, D6)[12] only have partial information. How: Measures for two Descriptors (D3 and D10) have sufficient information on operationalisation, while measures for four Descriptors (D1, D4, D6, D7) only have partial information. For example, it is unclear how much budget is mobilized for the implementation of the measures for D1, how coordination will be carried out, and the mode of action of most of the measures. When: Measures for two Descriptors (D3 and D10) have sufficient information on temporal coverage, while measures for four Descriptors (D1, D4, D6, D7)

		only have partial information.

6.16 Sweden

Summary:

Overall, the second programme of measures presented by Sweden is considered to be adequate to address the pressures acting on the Swedish marine environment and contributes to achieving Sweden's GES and targets.

The completeness of the Swedish report is very good. The measures and their characteristics are clearly listed and the rationale behind any change is well presented. Sweden has well described the administrative process for the implementation and follow-up of the measures and has put in place an implementation plan for each measure, which clarifies and times sub-operations, activities, and work processes. New biodiversity protection measures are identified, including a reduction in the area of trawl nets and increasing the use of selective and low impact gears. New marine protected areas and other spatial protection measures as proposed on a sufficient scale to support the achievement of GES.

The links between MSFD and other relevant EU legislation are mentioned. However, the mechanisms and outcomes of coordination are not presented; additional information would be necessary. While the regional/international cooperation is clearly described, little information exists on the assessment of transboundary impacts of measures. Measures for noise and contaminants have been assessed as only moderately adequate to address pressures.

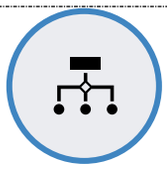
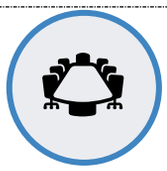
Based on the information reported in their programme of measures, Sweden's commitment to the implementation of their second programme of measures has been assessed as 'high'.

The adequacy of Sweden's programme of measures for **cross-cutting issues** is considered **good**.

The programme of measures has not experienced significant changes since the first cycle in terms of methods applied for measure selection, reported links between MSFD and other policies, regional and/or international policies, and public consultation. For both cycles, Sweden applied the same methodology.

The programme of measures respected the MSFD reporting guidelines and provided all the needed information notably on how results, from different methodologies, influenced measure selection. However, some information is still incomplete such as for example information concerning the economic analysis and the link between MSFD and other EU legislations.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The selection of measures was done by following a four-step approach clearly presented in the programme of measures. Sweden undertook a CBA and CEA for all MSFD specific measures and provided information on cost categories considered and the estimated benefits.	Sweden does not provide any information on the usefulness of CBA and CEA results; additional information could have helped in better understanding the results of the economic analysis. Sweden provides partial information on social issues investigated and no information is provided on the methodology followed nor on the social indicators investigated.

 **Interactions with climate change**	Climate change has been considered in the programme of measures where MSFD specific measures have been subject to a climate review.	Sweden seems to go further in its 3rd RBMP reporting exercise by emphasising the importance of setting-up measures due to climate change and setting a requirement for all competent authorities to take climate change into account within their activities.
 **Links to other policies**	Sweden mentions links between the MSFD and other EU legislations, namely WFD, MSP, and CFP. The programme of measures also referred to other EU policies such as the REACH directive, the EU Environmental Damage directive, the Single-use plastics directive, etc.	Sweden does not provide any information on the mechanisms nor on the outcomes of cooperation.
 **Regional cooperation and transboundary impact**	Cooperation with neighbouring countries was done through the European Commission, regional sea conventions as well as through bi- and multilateral contracts. Information on regional cooperation is well reported in the programme of measures and the cooperation with neighbouring countries had an impact on the selection of the measures.	Sweden does not provide clear information on whether a transboundary impact assessment was undertaken or not.
 **Public consultation and administrative process**	The public consultation addressed the authorities, municipalities, organizations, operators, the general public, and other stakeholders concerned by the programme of measures. Likewise, the timetable, work programme, consultation plan, overview of significant water management issues and the draft RBMPs were subject to public consultation for six months. The administrative process to make the programme of measures operational was well presented.	Sweden does not mention the level of modification to the programme of measures after the public consultation. It is not clear from the text if stakeholder views led to reviewing or removing some of the measures. The programme of measures does not mention any change in the evolution of the administrative process to implement MSFD specific measures.

The adequacy of Sweden's programme of measures to address **pollution** issues is considered **good.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Sweden's programme of measures for D5 is considered good.
Strengths		- Sweden has identified updates/changes to the existing measures from the first cycle. - Measures have been identified addressing the key pressures contributing to eutrophication. - The modified and additional MSFD specific measures address relevant pressures. - The modified and additional MSFD specific measures are linked to operational targets.

	- Sweden has generally provided the necessary information on where, when, and how the modified and additional MSFD specific measures will be implemented.
Weaknesses	- Sweden does not clearly describe how the updates/changes to the existing measures contribute to achieve GES. This is regrettable, as the assessment of Sweden's 3rd RBMPs concludes that implementation of measures to tackle nutrient pollution from agriculture needs to be accelerated as loads from agriculture represent 18-35 % of total nutrient load in coastal waters. - A gap analysis has been carried out but little detail is provided. - The gap analysis does not quantify the extent to which specific measures contribute to achieving GES. The assessment of Sweden's 3rd RBMPs concludes that 80 % of coastal water bodies are not in good ecological status. - Not all measures are linked to operational targets. - The financing of the measures remains unclear in the programme of measures.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures in the Baltic and North Seas had been partially addressed. In 2022, the assessment considers that all relevant pressures are addressed. - Some progress has been made since 2016 in more clearly identifying relevant pressures. The measures continue to cover all relevant components of GES and targets.
D8-Contaminants	
Adequacy 	The adequacy of Sweden's programme of measures for D8 is considered **moderate**
Strengths	- Contaminant pressures and relevant measures are reasonably well understood by Sweden. - Measures have been identified to address the key pressures contributing to contaminants. - All of the additional MSFD specific measures are linked to targets. - Sweden has generally provided the necessary information on where, when, and how the additional MSFD specific measures will be implemented.
Weaknesses	- Sweden has identified updates/changes to the existing measures from the first cycle but has not clearly described how these measures contribute to achieving GES. - A gap analysis has been carried out but little detail is provided in the programme of measures. - The gap analysis does not quantify the extent to which specific measures contribute to achieving GES. - Some of the additional MSFD specific measures do not appear to be targeted toward those contaminants that are currently causing failure of GES for D8. According to the assessment of Sweden's 3rd RBMPs, the measures in the Bothnian Bay and Bothnian Sea should in particular target dioxins and furans as these contaminants are the primary substance causing EQS failures in coastal water bodies. More generally, Sweden should take all necessary measures to prevent the emissions of mercury and PBDE as well as perfluorooctanesulfonic acids (PFOS), Cadmium, Nickel, polyaromatic hydrocarbons (PAH) and tributyltin (TBT). - Not all measures are linked to operational targets. - The financing of the measures remains unclear in the programme of measures.
Progress since 2016	- In 2016, the assessment considered that coverage of pressures in the Baltic and North Seas had been partially addressed. In 2022, the assessment considers that all relevant pressures are partially addressed. - In 2016, the programme of measures for the Baltic and North Seas covered all components of GES and targets. Some progress has been made since 2016 in more clearly identifying relevant pressures but there continues to be a lack of clarity concerning the specific impact that particular measures will have in making progress towards GES. The measures continue to cover all relevant components of GES and targets.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Sweden's programme of measures for D9 is considered **moderate**

Strengths	- Sweden has identified updates to the existing measures from the first cycle even if it has not clearly described how these measures contribute to achieve GES. - All additional MSFD specific measures are linked to operational targets. - Sweden has generally provided the necessary information on where, when and how the modified and additional MSFD specific measures will be implemented.
Weaknesses	- A gap analysis has been carried out but little detail is provided. - The gap analysis does not quantify the extent to which specific measures contribute to achieving GES. - Some of the modified MSFD specific measures may contribute marginally to addressing the key pressures causing failure of GES for D9 - The financing of the measures remains unclear. - The modified existing and MSFD specific measures are only likely to have a marginal beneficial impact
Progress since 2016	- In 2016, the assessment considered that coverage of pressures in the Baltic and North Seas had been partially addressed. In 2022, the assessment considers that coverage of relevant pressures was unclear. - In 2016, the assessment considered that the assessments for the Baltic and North Seas covered all components of GES and targets. Some progress has been made since 2016 in more clearly identifying relevant pressures but there continues to be a lack of clarity concerning the specific impact that particular measures will have in making progress towards GES.
D10 — Marine litter	
Adequacy 	The adequacy of Sweden's programme of measures for D10 is considered good.
Strengths	- Sweden reports the existing measures and provides clear links to relevant policies such as OSPAR North-East Atlantic Environment Strategy (NEAES) 2030 and HELCOM Baltic Sea Action Plan (BSAP) 2021-2030 as well as EU or national initiatives. - The link to the overall objective of reducing litter input in the marine environment is clear. - The "gap" related to the problem of fisheries-related litter is clearly addressed by the additional MSFD specific measures of the second cycle. - For all MSFD specific measures, the reporting clearly mentions the spatial and temporal scope of the measures as well as how they will be implemented
Weaknesses	- The gap analysis is considered partially adequate as, at least for beach litter, there is no clear mention of the measures still needed, and why. - The additional MSFD specific measures mainly focus on the pressure macro litter and beach litter rather than micro-litter and seabed and surface litter which are important to cover in the programme of measures with dedicated measures. - Not all relevant pressures are tackled with the programme of measures.
Progress since 2016	- Compared to the 2016 assessment, Sweden's report on D10 Marine Litter for the Baltic Sea under Art. 13 has slightly improved and certain progress has been made. - Regarding 'coverage of GES and targets', few improvements have been made in Sweden's programme of measures, since all measures reported are linked to the same two targets
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Sweden's programme of measures for D11 is considered good
Strengths	- Sweden identified the main contributors of impulsive noise and implement existing measures to limit the impulsive noise from offshore wind construction. - Sweden has created a new category 1.a measure to address continuous noise, prevent further inputs of pressure, reduce existing levels of pressure and establish monitoring programmes. - Impulsive noise seems to be covered fully with the various existing measures.

Weaknesses	- The gap analysis does not provide enough details. - With regards to continuous noise, there is still a lack of consensus on which sound levels produce a negative effect at population level. This complicates action work as it is not possible to assess the impact of measure. - Sweden has not carried out a national assessment of the status of underwater noise.
Progress since 2016	- Some progress is seen in the coverage of pressures; Sweden addressed the relevant human activities causing underwater noise. - There is no progress regarding the coverage of environmental targets.

The adequacy of Sweden's programme of measures to address **biodiversity** issues is considered **very good**.

Biodiversity

D1 — Biodiversity		
Adequacy		The adequacy of Sweden's programme of measures for D1 is considered very good
Strengths		- Sweden proposes both updates to existing measures and a series of additional MSFD specific measures to address a full range of pressures, including the introduction of non-indigenous species, physical loss and disturbance of the seabed, the input of nutrients and hazardous substances, and anthropogenic sound. - All measures are aimed at the relevant spatial scale, with most being applied to both coastal and offshore waters. - Where relevant, MSFD specific measures may also apply to terrestrial habitats. - All measures are linked to targets.
Weaknesses		- Few of the relevant targets are considered fully operational, leaving a gap between aspiration and delivery.
Progress since 2016		- Sweden's score in 2022 for the coverage of pressures in the Baltic region and Greater North Sea remains unchanged since 2016, with this being considered as fully addressed. - As in 2016 the assessment considered only updated or additional measures, and no measures are reported as being withdrawn, it is considered that progress has been made in addressing pressures through the programme of measures.
D2 — Non-indigenous species		
Adequacy		The adequacy of Sweden's programme of measures for D2 is considered good
Strengths		- Sweden identifies new measures from other initiatives which aim to reduce NIS introductions in both the Baltic Sea and North Sea. - Gaps for achieving GES under D2 were adequately identified within the programme of measures. - MSFD specific measures developed for for the Baltic and the North Sea aim to produce guidance for recognising and managing NIS in management plans/conservation plans for marine protected areas. These measures all address the D2 target by aiming to achieve the target value/indicator of a decreasing trend in the introduction of new NIS. - How and when the updated and additional MSFD specific measures will be implemented are stated by Sweden.
Weaknesses		- A baseline scenario in line with the Swedish environmental target for criterion D2C1 "a downward trend in the number of NIS introduced through human activities" has not yet been established. This has hindered the assessment of other potential gaps. - Knowledge gaps still exist regarding how and when GES will be achieved and may require several more years of monitoring to establish this.

Progress since 2016	- Progress for D2 regarding addressing relevant pressures has been made since the 2016 programme of measures for both the Baltic and the North Sea regions. - In 2016, it was assessed that the programme of measures only partially addressed the relevant pressures. Updated MSFD specific measures have addressed this gap by focussing on producing guidance for vessel hull cleaning. - In 2016, it was assessed that the programme of measures only partially addressed GES and targets for D2. MSFD specific updated measures in 2021 address this gap and contribute towards GES and the operational target with the aim to directly reduce introduction of NIS.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Sweden's programme of measures for D3 is considered good
Strengths	- The gap analysis provided information on existing measures and ways in which Sweden has sought to improve the implementation of EU fisheries policies, as well as implementation of recent national initiatives. - All relevant pressures are addressed in Sweden's updated programme of measures. - Sweden has explained where, how and when the MSFD specific measures will be implemented. - The reported measures constitute an appropriate range of measures to address the various pressures under D3 and will contribute to achieving GES.
Weaknesses	- The gap analysis did not specifically reference the environmental targets. - Some measures only refer to the desired state of an ecosystem component, and do not focus on reducing relevant pressures and impacts.
Progress since 2016	- In the 2016 assessment, it was concluded that Sweden had addressed the key pressure but had only partially addressed all components of GES and targets. - In 2022, Sweden is assessed to be continuing to address all relevant pressures in its updated programme of measures. - Sweden continues to partially address GES and targets in 2021.
D4 — Foodwebs	
Adequacy 	The adequacy of Sweden's programme of measures for D4 is considered good
Strengths	- Additional or updated measures relevant to D4 in the 2022 programme of measures addresses a broader range of pressures, complementing those in the 2016 programme. - Targets addressing a wider range of biodiversity elements are included in the 2022 programme of measures. - Measures partially address pressures on mammal habitats through improvements to spatial protection, MPA management, Maritime Spatial Planning and reduction of by-catch. - Additional or updated measures relevant to D4 in the 2022 programme of measures are all linked to one or more targets relating to hazardous substances, introduced alien species, fish populations and community structure, seabed, biogenic structures, hydrographic change, and marine litter.
Weaknesses	- No timelines for delivery of the measures were specified in the programme of measures. - The MPA measure is only indirectly relevant to D4 as it will limit activities causing physical disturbance to the seabed, which is directly related to D6. - Overall, it is considered that measures are only partially linked to operational targets.
Progress since 2016	- The assessment in 2022 for coverage of pressures in the Greater North Sea is considered addressed. - It is considered that progress has been made in addressing pressures though the programme of measures. - Sweden's score in 2022 for the coverage of GES and targets in the Baltic region and Greater North Sea has declined since the last report

D6 — Seafloor integrity	
Adequacy 	The adequacy of Sweden's programme of measures for D6 is considered very good
Strengths	- Additional or updated measures relevant to D6 seabed habitats webs in the 2022 programme of measures addressed a broader range of pressures, complementing those in the 2016 programme. - Sweden proposes both updates to existing measures and a series of MSFD specific measures which address a full range of relevant pressures, including physical loss and disturbance of the seabed, and input of nutrients and hazardous substances. - All measures are aimed at the relevant spatial scale, with most being applied to both coastal and offshore waters. - Where relevant, MSFD specific measures may also apply to terrestrial habitats. - All measures are linked to targets.
Weaknesses	- Only four targets (of a total of 22), two for the Baltic region and two for the Atlantic, relating to the introduction of nutrients and hazardous substances, are considered operational, so overall it is considered that measures are only partially linked to operational targets.
Progress since 2016	- Sweden's score in 2022 for the coverage of pressures in relation to D6 remains unchanged since 2016, i.e. fully addressed. It is considered that progress has been made in addressing pressures though the update of the programme of measures. - Sweden's score in 2022 for the coverage of GES and targets remains unchanged since 2016, i.e. partially addressed. It is considered that some progress has been made in linking measures to operational environmental targets.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Sweden's programme of measures for D7 is considered very good
Strengths	- Sweden's programme of measures is considered adequate for achieving or maintaining GES for D7 in both marine regions. - The gap analysis was done through an evaluation of the status of Sweden's marine against GES for D7 after the first MSFD cycle based on expert advice. - Sweden's updated programme of measures adequately addresses all relevant pressures for D7.
Weaknesses	- Cumulative impacts are not considered in the gap analysis. - Sweden has not defined any target value nor indicators for D7 environmental target, which weakens the link between the programme of measures and the ultimate objective of GES.
Progress since 2016	- The first cycle of the Swedish programme of measures adequately addressed both coverage of pressures and of GES/targets. There are no major changes since 2016 regarding the measures.

Based on the information reported in their programmes of measures, Sweden's commitment to the implementation of their second programmes of measures is assessed as '**high'**.

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when

Sweden has carried out an impact analysis of new measures prior to adopting them, including a Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA). Sweden has investigated the potential social impacts but only with respect to fisheries (professional and recreational).	Sweden relies mostly on government grants and other organizations to fund the implementation of measures, but EU funding (i.e. EMFAF) is also listed. Partial information on the amounts of funding mobilized (approximately 2.2 billion euros for the 2021 - 2027 period) was provided but no information was provided on the amounts mobilised from the EU funds.	Finaland reported the links between the MSFD, WFD, MSP, CFP in terms of common measures and objectives. However, there is no mention of links with the HBD. International coordination took place through the European Commission, the regional sea conventions (OSPAR and HELCOM), as well as through bi-and multilateral contracts. This is led by the Swedish Agency for Marine and Water Management. Under regional cooperation, Sweden reported having effectively identified required measures and excluded measures already in place in the RSC action plans and/or in the Programme of Measures of neighbouring countries.	Where: Measures for 10 Descriptors (except D7[428]) have sufficient information on spatial coverage. How: Measures for eight Descriptors (D1, D2, D3, D4, D6, D9, D10, D11) have sufficient information on operationalisation, while measures for two measures (D5, D8) only have partial information. When: Measures for 10 Descriptors (except D7) have sufficient information on temporal coverage. For example, D8 measures for the Baltic Sea will generally be implemented in the period 2022 to 2027, and for some measures, an action plan is being prepared which will further inform implementation.

6.17 Slovenia

Summary:

Overall, the second programme of measures presented by Slovenia is considered as moderately adequate to address the pressures acting on the Slovenian marine environment and partially contributes to achieving Slovenia's GES and targets.

In terms of strengths, Slovenia provides a very comprehensive report, linking well its assessment to environmental targets and measures. Slovenia has set up clear administrative framework/processes for implementing the measures, including for public consultations, and provide an estimation on the costs of each individual measure and their implementation. Climate change ecosystem resilience is strategically approached, including through the protection of carbon sinks. Measures for litter and seafloor integrity have been considered as adequate.

On the downside, the programme of measures does not explain how the measures were selected based on the cost-benefit analysis. Slovenia does not make any references to the Biodiversity Strategy, Fit for 55 or the Zero Pollution Action Plan. The measures for noise and hydrological conditions have been considered as not sufficient to address pressures.

Based on the information reported in their programme of measures, Slovenia's commitment to the implementation of their second programme of measures has been assessed as 'medium-high'.

The adequacy of Slovenia's programme of measures for **cross-cutting issues** is considered **moderate**.

([428]) Sweden did not propose additional and modified MSFD specific measures for D7.

Most of the required information has been reported, although there are areas where only partial or no information have been provided. Slovenia's general approach to developing its second programme of measures from the perspective of cross-cutting issues has stayed consistent. However, it is difficult to conclude if there has been any change in implementation processes and coordination mechanisms as Slovenia did not report on these issues.

Topic	Strengths	Weaknesses
 **Socio-economic assessment**	The programme of measures includes an estimation on the costs of each individual measure and presents costs for the implementation. Slovenia updates the initial assessment and includes the 'socio-economic' benefits in a wider perspective. Benefits are expressed in quantitative and qualitative terms.	The programme of measures lacks evidence on the results of the cost-benefit and cost-effectiveness analysis. Benefits are not assigned or distributed to individual. The potential distribution of impacts and the acceptability of measures amongst current and future stakeholders is not presented.
 **Interactions with climate change**	Slovenia includes a strategic objective on tackling climate change, and highlights measures that contribute to ecosystem resilience from climate change and protection of carbon sinks.	The programme of measures does not include the assessment on how the measures could contribute to climate change (emissions reduction and increase).
 **Links to other policies**	Slovenia reported the different national, regional, EU and private sector funding sources for each measure. It is clearly specified whether the measures are to be delivered under the WFD, the MSP, the CFP or the HBD and on how the MSFD links with these policies in terms of environmental objectives and the implementation of measures. .	The reference to 'EU funds' doesn't not allow to understand to which fund Slovenia is referring to. The information is missing on how or whether coordination between EU policies and the MSFD has evolved since the MSFD programme of measures. Several measures can be linked with the EU Biodiversity Strategy, Zero Pollution Action Plan and Fit for 55 but no reference is made to these policies. A reference in terms of policy requirements is made to the European Green Deal but without linking it to strategic objective on tackling climate change and relevant measures.
 **Regional cooperation and transboundary impact**	Slovenia presented the different regional and international cooperation mechanisms linked to the programme of measures. They also described how these are linked with the MSFD in terms of objectives and the delivery of measures. The programme of measures recognised the transboundary impacts and includes a sub-measure on transboundary environmental impact assessments.	The evolution of international and/or regional cooperation mechanisms is not presented in the programme of measures. There is no reference to specific consultation with other Member States regarding measures with transboundary impacts.

Public consultation and administrative process	Details are provided on when the consultations were done and the hyperlinks to consultation documents is reported, The programme of measures includes information on the operational implementation of the measures.	The programme of measures is not elaborate on how long the consultation periods were or if there were any active promotion or targeting of the consultation. No information is provided on whether there have been any changes to the implementation process and/or the administrative framework since the MSFD programme of measures.

The adequacy of Slovenia's programme of measures to address **pollution** issues is considered **moderate.**

Pollution

D5- Eutrophication		
Adequacy		The adequacy of Slovenia's programme of measures for D5 is considered moderate
Strengths		- Slovenia has explained how updates to existing measures and additional measures from other initiatives contribute to achieving GES. - The programme of measures makes linkages between the existing measures and the WFD-River Basin Management Plan (RBMP). Incidentally, these were not submitted in time to be integrated into the Commission's assessment of WFD's RBMPs and cross-checking could not be done. - Slovenia has undertaken a gap analysis taking into account data monitoring. - The additional existing measures identified will directly address discharges of urban wastewater into the marine environment and wastewater from vessels.
Weaknesses		- The references to Zero Pollution targets, the continuing work of the Barcelona Convention and the updates to the National Emissions Ceiling Directive as "existing measures" are missing. - The gap analysis has not included all the elements expected, for example, to what extend the current measures will reduce pressures, or future socio-economic developments.
Progress since 2016		- In 2016, the assessment considered that coverage of pressures had been partially addressed. In 2022, it is considered that there is a broader coverage of the pressure. - In 2016, it was considered that the measures addressed the components of GES and targets. The situation improved in 2022, thanks to two additional existing measures aimed at reducing contaminants from wastewater.
D8-Contaminants		
Adequacy		The adequacy of Slovenia's programme of measures for D8 is considered moderate
Strengths		- Information on how some updates to existing measures and additional measures from other initiatives contribute to achieve GES are provided in the programme of measures. - Slovenia has undertaken a gap analysis taking into account data monitoring. - The necessary information on where, when, and how the specific additional MSFD specific measures will be implemented are included in the e-reporting.
Weaknesses		- The modified and additional MSFD specific measures are not considered to be linked to operational targets. - The programme of measure is not clear on whether the gap analysis has included all the elements expected, for example, to what extend the current measures will reduce pressures, or future socio-economic developments. - The target reported are not considered as operational.

	- The reference to Zero Pollution targets, to the continuing work of the Barcelona Convention and to the updates on the National Emissions Ceiling Directive are missing. - GES is not currently being achieved for some substances including TBT, mercury and benzo(a) pyrene and the measures will not address benzo(a)pyrene contamination in sediments. - There remains uncertainty whether funding for the measures has been secured.
Progress since 2016	- In 2026, it was considered that coverage of pressures had been addressed. In 2022, the assessment considers that coverage of relevant pressures was partially addressed as the modified and additional MSFD specific measures address most of the relevant pressures to some extent, although the measures will not address benzo(a)pyrene contamination in sediments. - In 2016, the measures addressed the components of GES and targets. In 2022, the assessment considers that the modified and additional MSFD specific measures did not adequately address GES and targets.
D9 — Contaminants in seafood	
Adequacy 	The adequacy of Slovenia's programme of measures for D9 is considered moderate.
Strengths	- The additional existing measures identified will directly address discharges of urban wastewater into the marine environment and wastewater from vessels. - Slovenia has undertaken a gap analysis, although it is limited due to limited available monitoring data. GES is reported as currently achieved for D9.
Weaknesses	- Slovenia has not clearly explained how updates to existing measures contribute to maintaining GES.It is unclear whether the gap analysis has included all the elements expected, for example, consideration of how much current measures will reduce pressures, or future socio-economic developments. The contribution which D8 measures make towards D9 targets is not recognised. - There is no reference to WFD, Zero Pollution targets or the continuing work of the Barcelona Convention.
Progress since 2016	- In 2026, the coverage of pressure was considered as addressed. In 2022, the assessment considers that there is a broader coverage of the pressure through the additional existing measures. - In 2016, the assessment considered that the measures mostly addressed the components of GES and targets. The situation improved in 2022, thanks to two additional existing measures aimed at reducing contaminants from wastewater.
D10 — Marine litter	
Adequacy 	The adequacy of Slovenia's programme of measures for D10 is considered good.
Strengths	- The gaps identified during the first cycle and how these have been addressed in the second programme of measure are well described. - The modified and additional MSFD specific measures address relevant pressures. - Slovenia has provided most of the required information on where, how and when the new measures will be implemented. - One of the additional MSFD specific measures addresses submerged end-of-life vessels.
Weaknesses	- The gap analysis by Slovenia is partially adequate as it does not specify how much the relevant pressures associated with D10 have been or will be further reduced by the combined modified existing measures. - Slovenia reports that the current state in relation to GES for D10 is poor for most litter elements but does so without specifically referring to important recent developments such as the EU beach litter threshold value or Zero Pollution Targets. - The programme of measure doesn't specify how the existing measures will effectively contribute to GES. - Some targets referenced (D10C1 and D10C2) were not considered operational.

	- Future socio-economic developments are not mentioned in relation to achieving GES for D10.
Progress since 2016	- In 2016, it was considered that the measures cover the relevant pressures. The same conclusion in made in 2022. It is noted, however, that measures specifically targeting micro-litter and litter ingested by animals are not included in Slovenia's second programme of measures. - In 2016, it was considered that the measures addressed the GES components and targets definitions. In 2022, the modified and additional MSFD specific measures do not adequately address GES and targets. - While broad timelines are provided for all relevant new measures, the timeline to achieve GES remains unclear in the 2022 assessment, as was the case in the 2016 assessment.
D11 — Underwater noise and energy	
Adequacy 	The adequacy of Slovenia's programme of measures for D11 is considered poor
Strengths	- Slovenia has started to produce simplified sound maps to assess continuous noise. - The modified new measures aimed at directly reducing pressures in the marine environment and preventing further inputs of pressure. - Slovenia leverages the recommendations made by regional and international organisations (IMO, HELCOM, ACCOBAMS). - Environmental targets for D11 are adequately defined and addressed by the modified new measures that, if properly implemented, will lead to the reduction of impulsive noise and continuous noise.
Weaknesses	- Slovenia did not carry out a gap analysis for D11 due to lack of information/data availability. - The nature of the missing data is not clearly identified, neither for impulsive noise nor for continuous noise; there are no details on how the missing data will be gathered. - Reference to the implementation of TG Noise guidance as to the decisions and recommendations made by TG Noise on how to implement a regional monitoring, implement regional assessment and set targets on low frequency continuous noise are yet missing. - The maps produced do not consider the variability of the marine environment and have not yet been calibrated/compared with in-situ measurements made by a network of hydrophones. Those maps can therefore be misleading on where and when measures shall be implemented. - The implementation of the modified new measures should be detailed. - The relationship between the findings of the monitoring program and the measures is not provided. - Energy input such as heat or electromagnetism is not addressed by the updated programme of measures.
Progress since 2016	- The adequacy of Slovenia's report on D11 in the second programme of measures deteriorated compared to the 2016 assessment. This is mainly because the gap analysis was not carried out due to lack of data for D11. - In 2016 it was concluded that the measures adequately covered all pressures, GES and target definitions. In 2022, not much progress was made, except for the description of the measures. The lack of data remains the main gap to be addressed.

The adequacy of Slovenia's programme of measures to address **biodiversity** issues is considered **moderate.**

Biodiversity

D1 — Biodiversity

Adequacy		The adequacy of Slovenia's programme of measures for D1 is considered **moderate**
Strengths		- The current status is reported in detail for all 6 of the ecosystem components as well as an update on progress towards GES and environmental targets. - A gap analysis is performed and shows that the existing measures from the first cycle were not sufficient to meet GES for descriptor 1. - Updated and additional MSFD specific measures reported in the updated programme of measures address the relevant pressures and targets. - Slovenia brings forward 18 new updated and additional measures under Descriptor 1, which shows commitment to improve biodiversity in national waters. Slovenia now has a substantial number of Descriptor 1 measures compared to the size of their national coastline. - All descriptive information on the measures is presented. - The new spatial protection measures address relevant pressures and have identified target habitats.
Weaknesses		- The biggest gap identified by the gap analysis is a distinct lack of data and knowledge regarding local species populations, but this gap is not addressed in the updated programme of measures. - The targets and pressures which are reported are those for descriptor 6. - There is no justification provided by Slovenia regarding updates made to existing measures and additional measures from other initiatives introduced in the second cycle and how they will progress towards GES. - Measures focus on the maintenance and protection of seabed habitats only. Protection of habitats which are important to pelagic and bird species are not considered. - Timelines are only provided for the entire measure implementation (and not for each stage), and the description of how measures will be implemented is more of a summary. - Not enough information is provided to confirm the potential effectiveness of the new spatial protection measure.
Progress since 2016		- In 2016, the assessment determined that pressures and targets were partially addressed by measures. Progress made since 2016 has been limited, with updated and new measures in the second cycle. - More direct measures for the species not meeting GES are required to acknowledge significant progress.
D2 — Non-indigenous species		
Adequacy		The adequacy of Slovenia's programme of measures for D2 is considered **moderate**
Strengths		- Slovenia, thanks to NIS monitoring, establishes a baseline scenario of the number of NIS introductions and NIS distributions within its waters. - The gap analysis highlighted the need for cross-border, regional level approaches to NIS introductions which is being addressed already by an existing measure.
Weaknesses		- The contributions to the modified and additional existing measures to achieve GES are not provided. - No indication is given on the progress of any first cycle measures. - The gap analysis relating to other pathways of introduction, such as hull fouling and aquaculture, has not been clearly undertaken, which prevents further measures to be implemented to reduce the pressure.
Progress since 2016		- Progress has been made since 2016 in terms of NIS monitoring. However, no new measures were proposed for the 2022 programme of measure and hence no additional progress has been made in 2022 to address gaps linked to the introduction of NIS. - In 2016, it was assessed that the programme of measures only partially addressed relevant pressures for D2. In 2022, no new measures are identified to address the pressure.

	- In 2016, it was assessed that the programme of measures addressed GES and targets for D2. It is similar in the 2022 programme of measures.
D3 — Commercial fish and shellfish	
Adequacy 	The adequacy of Slovenia's programme of measures for D3 is considered moderate
Strengths	- Slovenia's gap analysis is partially adequate: a summary of status on GES is provided, and the first cycle measures already in place and additional existing and new measures are identified.
Weaknesses	- Slovenia has partially explained how updates to existing measures contribute to achieving GES. - Some information from the gap analysis is missing baseline scenario, analysis of how much current measures will reduce pressures, and how future socio-economic developments might affect the achievement of GES.
Progress since 2016	- In 2016, Slovenia's programme of measures report was considered to address relevant pressures from commercial and recreational fishing and the programme of measures was considered to address D3 GES and targets. - In 2022, no modified or additional MSFD specific measures were reported that were specific to D3. There was therefore no explicit assessment of whether pressures and GES and targets are being addressed
D4 — Foodwebs	
Adequacy 	The adequacy of Slovenia's programme of measures for D4 is considered moderate
Strengths	- Updated and additional MSFD specific measures reported in the updated programme of measures address the relevant pressures and targets reported in the e-reporting. - All descriptive information on the measures is provided. - New spatial protection measures address relevant pressures (although indirectly) and have identified target habitats.
Weaknesses	- There is no justification on existing measures updates and on additional measures from other initiatives introduced in the second cycle and how they will improve progress towards GES for descriptor 4. - The provided gap analysis simply states that there is not enough available information or a sufficient method to assess food web health in Slovenian waters. - The targets and pressures which are reported are the same as for descriptor 6. - Measures also focus on the maintenance and protection of seabed habitats only, despite many pelagic and bird species being reported as in decline in the current status analysis. - Information on how, when and where each measure will be implemented is also sparse. - Timelines are only provided for the entire measure implementation (not for each stage), and the description of how measures will be implemented is more of a summary. - The effectiveness of the new spatial protection measures should be presented. - Slovenia should design and implement measures which investigate local food webs, and then attempt to protect them.
Progress since 2016	- No progress has been made since 2016, with descriptor 4 rarely mentioned in the written report, and discussed mainly as a consequence of descriptor 1. To progress towards GES in food web health, this descriptor must be considered in its own right and food webs must be assessed for vulnerabilities.
D6 — Seafloor integrity	
Adequacy 	The adequacy of Slovenia's programme of measures for D6 is considered good
Strengths	- The gaps in the progress towards GES are identified by the gap analysis as well as a clear picture of the current status of Slovenian seabed habitats.

	- All relevant pressures are well addressed by the measures. - Slovenia introduced several protected areas which aim to provide solace for several important and vulnerable seabed habitats. - Most of the descriptive information on new measures is found in the reporting. - A clear effort has been made to increase the percentage coverage of seabed protection as well as the variety of vulnerable habitats under protection.
Weaknesses	- The justification of updates made to existing measures and additional measures from other initiatives and how they will improve progress towards GES is not provided. - The gap analysis doesn't include the socio-economic development, the baseline scenarios, the links to new measures and environmental targets. - Measures to fill the knowledge gaps are not presented in the updated programme of measure. - the targets which focus on the biological community are not contributing to address the pressure. There is no explicit mention of the need to reduce or remove the pressure of bottom-trawler fishing in these protected areas, despite being one of the main pressures facing seabed habitats. - The effectiveness of management and the scale of the protected areas could be clarified. - Timelines are only provided for the entire measure implementation (not for each stage), and the description of how measures will be implemented is more of a summary.
Progress since 2016	- In 2016, the assessment concluded that all pressures were addressed by measures, but targets were only partially addressed. Progress since 2016 has been made. All relevant pressures remain covered by the reported measures, many of the targets are also met thanks to the measures introduced in the updated programme of measures. - In 2016, the assessment states that GES has been addressed by the measures. However, in the gap analysis of the updated programme of measures, it is reported that infralittoral habitats are not currently meeting GES, therefore leading to an unclear statement.
D7 — Hydrographical changes	
Adequacy 	The adequacy of Slovenia's programme of measures for D7 is considered poor
Strengths	- Slovenia has updated its programme of measures for D7 and reported that 21 measures will address pressures potentially linked to hydrographical alteration.
Weaknesses	- No gap analysis has been carried out by Slovenia for this descriptor and no analysis of relevant pressures (existing or linked to future developments) has been provided. - No justification is provided on the links between the new measures and D7. Therefore, it is not possible to understand how the measures will contribute to achieving environmental targets and ultimately GES for D7. - No clear analysis is provided on future developments that could cause pressures linked to hydrographical changes, even if some mentions are made in the text report (e.g. marine aquaculture or tourism). - The information insufficiently describes the actions planned and the expected outputs and outcomes. - Slovenia does not mention cross-border or regional cooperation, despite its geographical situation.
Progress since 2016	- Based on the 2022 report, the assessment shows a regression. This is partly linked to higher expectations for the second cycle (such as a better determination of GES for D7, proper assessment of status (pressures, state, threats) and sound definition of operational environmental targets. - Slovenia's report on its programme of measure has been assessed adequate, based on a rather qualitative assessment.

Based on the information reported in their programmes of measures, Slovenia's commitment to the implementation of their second programme of measures is assessed as "**medium-high".**

Key Factor 1: Socio-economic impacts of new measures	Key Factor 2: Financing sources and use of EU funds	Key Factor 3: Coordination with EU policies and regional coordination	Key Factor 4: Implementing modified and additional MSFD measures: where, how and when
CBA and CEA for some new measures, and not clear how results influence measure selection or prioritisation. No evidence of investigating social impacts of measures.	Funding sources include municipal budgets, the national budget, EU funding, regional funding, and private sector and public sector investments. There is no information on the proportion of cost or amount that will be funded by EU funds, and there is no information on which EU funds will be used or if they are appropriate.	Describes the links between the MSFD and other EU policies in terms of environmental objectives/targets and the implementation of measures. Measures specifically linked with the CFP, HBD, WFD and MSP were identified, and authorities responsible for implementation of individual measures were listed. The regional and international mechanisms linked with the second Programme of Measures were identified. These include the Barcelona Convention, the IMAP Programme (for marine monitoring), the General Fisheries Commission for the Mediterranean, and the International Maritime Organisation.	Where: Measures for four Descriptors (D7, D8, D10, D11)[14] have sufficient information on spatial coverage. For example, measures for D10 cover the Mediterranean Adriatic Sea and include coastal waters, territorial waters, transitional waters and terrestrial parts of the MS. Measures for three Descriptors (D1, D4, D6) only have partial information. How: Measures for seven Descriptors (D1, D4, D6, D7, D7, D10, D11) only have partial information on operationalisation. When: Measures for two Descriptors (D10 and D11) have sufficient information on temporal coverage, and measures for four Descriptors (D1, D4, D6, D8) have partial information. Spatial coverage of measures for D7 is not clear.

7. Country-specific recommendations

7.1 Recommendations for immediate improvements

6. Member States should identify and put in place, as appropriate**, additional measures to reduce persistent environmental challenges** (pressure) that prevent the achievement of good environmental status.
    a. On **pollution**, this involves:
        i. stepping up action to reduce underwater noise pollution, including by tackling the main sources of continuous noise – such as shipping – and by setting up low-noise areas for marine species;
        ii. stepping up action to reduce nutrient pollution to achieve the objectives of the MSFD, WFD and the Nitrates Directive;
        iii. reducing chemical pollution from sea-based sources, in particular hydrocarbon extraction, and from novel substances, including PFAS, pharmaceuticals or microplastics;
        iv. continuing action to reduce the impact of litter on marine life, while reducing the inputs at source.
    b. On **biodiversity**, this involves:
        i. completing the network of coherent, representative, effectively managed MPAs to reach the 2030 target set in the biodiversity strategy to protect 30% of waters, including 10% strictly, in line with the ambition set in the marine action plan and the obligations under the Kunming-Montreal Global Biodiversity Framework;
        ii. stepping up action to reduce the bycatch of sensitive species, starting with the priority species as recommended in the marine action plan;
        iii. implementing without delay the obligations under the Nature Restoration Regulation as critical contributions to achieving GES under the MSFD;
        iv. tackling the risks to marine ecosystems linked to the projected expansion of offshore renewable energy production, together with the cumulative impacts of existing activities at sea, through forward-looking ecosystem-based maritime spatial planning.
    c. Regarding **climate change**, all Member States should seek to factor climate change in the design and selection of their measures and in particular:
        i. prioritise measures that help limit/reduce greenhouse gas emissions, including by restoring blue carbon ecosystems;
        ii. ensure that other measures or groups of measures do not increase greenhouse gas emissions;
        iii. take measures to strengthen the adaptive capacity of coastal communities to climate change, e.g. by restoring coastal ecosystems.
7. Member States should **increase investment and provide sufficient financing to implement the programme of measures** to reach the MSFD objectives. This involves in particular:

a. developing a strategic outlook for investments to achieve good environmental status, avoiding a piecemeal approach to funding individual measures and reducing inefficiencies across different policy areas;

b. clearly identifying the source of financing needed to implement all measures;

c. making use of existing financial instruments and tools that support the development of measures for marine protection and sustainable use, including through research and innovation, such as the Cohesion, Recovery and Resilience Facility, regional funds, EMFAF, LIFE and Horizon Europe in its different clusters (e.g. Missions and Partnerships), among others.

8. Member States should put in **place governance mechanisms that support the design and implementation of ambitious, coherent, coordinated, fair and effective programmes of measures**. This involves:

   a. tackling decisively the obstacles to implementing the measures, such as insufficient financing;

   b. improving coordination across authorities to ensure that MSFD measures dependent on other policies are fully implemented by the authorities dealing with implementation of these policies, notably in relation to fisheries, agriculture and energy;

   c. involving the public and stakeholders at the planning stage, taking their contributions into account in the design of measures and ensuring social acceptability of the measures proposed, adopting accompanying measures to limit potential negative impacts if necessary;

   d. increasing early coordination of programmes of measures with neighbouring Member States to ensure coherence, synergies and the complementarity of measures in the region and planning joint action where necessary;

   e. operationalising the spatial aspects of MSFD programmes of measures through maritime spatial plans to ensure that the spatial protection measures and spatial pressure reduction measures planned are fully taken up in the MSP.

7.2 Recommendations for third programmes of measures

In addition to the recommendations for immediate improvements laid out in the section above, the analysis of Member States' programmes of measures has allowed the identification of a number of actions to be taken in the preparation and design of the third programmes of measures.

7.2.1 Cross-cutting issues

Topics	Recommendations	Member States
 **Socio-economic assessment**	• Assess impacts of measures on different social groups and the social acceptability of measures. Indicate if the update of the programme of measures has been influenced by concerns on human well-being and/or the well-being of specific groups.	BE, CY, DE, EE, ES, FI, FR, IE, IT, LT, LV, NL, PL, PT, RO, SE, SI
	• Use the outcomes of the socio-economic analysis of the programme of measures in order to: o Adapt the list of measures initially proposed (removing or adding some measures). o Adapt the scale of measures. o Adopt accompanying measures to limit potential negative impacts. o Set up priorities for the allocation of financial resources.	BE, CY, DE, ES, FI, FR, IE, IT, LT, NL, PT, SE, SI

Topics	Recommendations	Member States
 **Interactions with climate change**	• Carry out a climate assessment of the programme of measures and use the outcomes to support the selection, design, or adaptation of the proposed measures in particular in order to take into consideration how the programme of measures for the MSFD link to and contribute to national, regional and European strategies and efforts on climate change.	BE, CY, DE, EE, ES, FI, FR, IE, IT, LT, LV, NL, PT, RO, SI
 **Links to other policies**	• Strengthen synergies between the MSFD and other EU legislation (notably WFD, MSP, BHD, and CFP) by taking adequate and coherent measures.	BE, DE, FI, FR, IT, LT, NL, PL, RO
	• When links between the MSFD and other EU legislations exist, put in place adequate coordination mechanisms to ensure that MSFD measures dependent on other policies are fully implemented by the relevant authorities and ensure outcomes of this coordination.	CY, DE, ES, FI, FR, IE, PL, PT, SE
	• Provide additional information on the total amount that will be mobilized, the relative share of financing allocated to different sectors and/or descriptors in order to understanding the coherence between pressures/problems to be solved and the mobilisation of EU funds (e.g. European Maritime, Fisheries and Agriculture Fund, Cohesion Fund...).	BE, DE, ES, FI, FR, IE, IT, LV, NL PL, RO, SE, SI
	• Take into account the transboundary (positive and negative) impacts in the identification of the measures. When possible transboundary impacts have not been assessed, the Member States should summarise the reasons justifying this choice.	BE, ES, FI, FR, IE, IT, LT, NL, PL, PT, RO, SE
	• Share details of planned programme of measures with neighbouring Member States in advance in order to increase coherence of measures in the region and consult neighbouring Member States as provide information on the outcome of this consultation.	BE, EE, ES, FR, IE, IT, PL
 **Public consultation and administrative process**	• Ensure that all relevant stakeholders are involved in the planning process and that their contributions are taken into account adequately when finalising the programme of measures and provide information on how the views of different stakeholders were considered in the final programme of measures and how they influenced the final programme of measures.	DE, ES, FI, IE, IT, LV, NL, RO, SE
	• Provide additional information on the evolution of the administrative framework between planning cycles. Information provided should help understanding the reasons for such changes, the changes made, as well as the resulting improvements expected in the MSFD implementation.	BE, DE, EE, FR, IE, IT, LV, PT, RO, SE, SI

7.2.2 Methodological recommendations

Topics	Recommendations	Member State
Gap analysis	• The gap analysis should include a baseline scenario differentiating between measures that are adopted and already implemented and measures adopted but not yet/fully implemented. The baseline scenario should be used as the benchmark against which alternative options should be compared.	BE (D1, D4, D6) CY (D1, D2, D4, D6, D11) EE (D11) ES (D2) FI (D6) FR (D1, D2, D3, D4, D6, D7) IE (D2) IT (D1, D2, D4, D5, D6, D7, D8, D9, D10, D11) LT (D1, D4, D6, D11) NL (D1, D4, D6, D10, D11) PT (D2) SE (D1, D4, D11)

Topics	Recommendations	Member State
		SI (D1, D4, D6)
	• The gap analysis should include an estimation of how the measures currently in place (from the first cycle) will have reduced anthropogenic pressures in the timeframe of the baseline scenario and the consequent change in each of the state components.	BE (D6, D4, D10) CY (D1, D3, D4, D11, D6, D7) DE (D3, D10, D11) EE (D1, D4, D7, D11) ES (D7) FR (D7) IE (D10) IT (D1, D3, D4, D6, D7) LT (D1, D4, D6, D11, D10) LV (D3) NL (D1, D3, D4, D6, D11) PL (D3, D10) PT (D5, D7, D8, D9, D11) RO (D1, D2, D3) SE (D3, D9, D11) SI (D1, D3)
	• The gap analysis should include a clear conclusion on whether the measures from the first cycle and updated existing measures are sufficient to achieve MSFD environmental targets and achieve or maintain GES.	BE (D1, D4, D6) CY (D1, D11, D3, D4, D6) DE (D4, D7) EE (D11, D3, D7) ES (D3) FI (D4) FR (D10, D11, D7) IE (D2) IT (D1, D2, D3, D4, D5, D6, D7, D8, D9, D10) LT (D2, D1, D3, D4, D6, D10, D11) LV (D2, D3) NL (D2, D1, D11, D4, D6) PT (D1, D4, D6) RO (D2, D1, D4, D6, D7) SE (D11) SI (D1, D10, D11, D4)
	• The gap analysis should include a clear timeline of when GES will be achieved.	BE (D3, D7, D10) CY (D3, D4, D6) DE (D3) EE (D1, D2, D4, D7, D9) ES (D1, D2, D3, D5, D7, D8, D9, D11) FI (D5) FR (D3) IE (D3, D4, D6, D8, D9) IT (D2, D9) LT (D1, D2, D8, D9, D10, D4, D6, D7, D5) LV (D1, D2, D5, D6, D8) NL (D3, D5, D8, D1, D4, D6) PT (D1, D4, D6) RO (D2, D3, D5, D7, D8, D11) SE (D11) SI (D7)
Effectiveness of measures	• Member States should quantify the pressures present in their 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.	BE (D1, D4, D6, D5, D8, D9, D10) CY (D1, D2, D4, D5, D6, D8, D9, D7) DE (D1, D5, D6 D8, D9) EE (D1, D3, D4, D5, D6, D8, D9) ES (D1, D2, D5, D7, D8, D9) FI (D6, D8, D9) FR (D1, D5, D6 D8, D9, D10) IE (D4, D6, D7, D10) IT (D1, D3, D6) LT (D5, D6, D8, D9)

Topics	Recommendations	Member State
		LV (D1, D4, D6, D5, D8, D9) NL (D1, D4, D5, D6, D8, D9) PL (D1, D8, D9, D4, D6) PT (D1, D4, D5, D6, D8, D9) RO (D1, D4, D5, D6, D8, D9) SE (D1, D2, D4, D5, D6, D8, D9) SI (D4, D5, D6, D8, D9, D7)
	• Member States 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.	BE (D5, D7, D8, D9) CY (D1, D4, D6) EE (D4, D6, D1, D8, D9) FI (D8, D9, D5) IE (D7) IT (D4, D6, D1) LT (D1, D4, D6) NL (D4) PT (D1, D4, D6) RO (D1, D4, D6) SI (D1, D4, D6)
	• Member States should ensure that their modified/additional new measures will be implemented. In particular, Member States should clearly identify: • the timelines for implementation for all new measures and include and implementation plan; • the source of financing for implementation of all measures and ensure that financing is in place to implement all measures; • the entities in charge of implementation for all their measures	BE (D1, D2, D3, D4, D6, D7, D8, D10, D11) CY (D1, D4, D6 DE (D1, D4, D6, D7) EE (D1, D4, D6) ES (D1, D2, D4, D6, D10) FI (D3, D1, D6, D5, D8, D9) FR (D1, D6, D2, D3, D5, D7, D8, D9) IE (D3, D5, D6, D8, D9, D10, D11) IT (D2, D3, D5, D10, D1, D4, D6) LV (D10, D3) LT (D1, D4, D6, D2) NL (D10, D3, D5, D1, D4, D6, D11) PL (D5, D8, D9, D1, D4, D6, D11) PT (D1) RO (D1, D2, D4, D6, D7) SE (D5, D8, D9, D6) SI (D1, D4, D6, D7, D10, D11)
	• Member States should ensure a better balance between direct and indirect measures when many indirect measures have been reported.	CY (D1, D2, D4, D6) DE (D1) EE (D4, D6) FI (D1, D4, D6) IT (D1, D4, D6) LT (D1, D4, D6) LV (D8, D10) PT (D2, D10, D9) RO (D1, D4, D6) SI (D1, D4, D6)
	• Member States should explain better how a measure reported for several descriptors is relevant for each one of these descriptors	BE (D1, D4, D6) CY (D1, D4, D6) DE (D4) EE (D1, D4, D6) ES (D1, D10, D2) FR (D2) IE (D11, D8, D9) D2, D10) IT (D1, D4, D6) NL (D1, D4, D6) PT (D1) SI (D1, D4, D6)
	• Member States should justify the withdrawal of certain measures explaining why those measures are not relevant anymore.	BE (D3, D1, D6) ES (D3, D1, D4, D6) FI (D7)

Topics	Recommendations	Member State
		IE (D11) LT (D3) LV (D3) PL (D1, D3, D10, D11, D5) PT (D3)
	• Member States 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 States should consider establishing additional measures beyond spatial protection efforts to address species and habitats.	BE (D1, D4, D6, D7) CY (D4, D6) EE (D1, D10, D4, D6) FI (D10) IE (D2, D6) LT (D10) LV (D1, D4, D6) PL (D7) PT (D1, D7) SI (D1, D4, D6, D7)
Consistency of marine strategies	• Member States should ensure consistency of their 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.	BE (D2, D4, D3) CY (D6, D7, D3) FI (D6) IE (D4, D6) IT (D1, D4, D6) NL (D4) PL (D11, D3) RO (D1, D4, D6, D3) SE (D1, D4, D6, D3)
	• Member States should ensure better links between their 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.	BE (D1, D4, D6, D8, D9) CY (D5, D7) EE (D1, D4, D5, D6, D8, D9) FI (D8) FR (D5, D8, D9, D11) LT (D1, D4, D5, D6, D8, D9, D11) LV (D1, D4, D5, D6, D8, D9) PL (D1, D4, D5, D8, D9) PT (D1, D4, D5, D6, D8, D9) RO (D3) SE (D4, D6) SI (D1, D4, D7)
	• Member States should define operational environmental targets under Art. 10 to ensure that the modified and/or additional new measures contribute to their achievement.	BE (D10, D3, D4) CY (D4) DE (D10, D11, D3) EE (D11) ES (D1, D4, D6, D10, D11, D3, D7) FI (D3, D7) IE (D10, D5, D8, D9 IT (D1, D3, D5, D8, D9) LT (D7) LV (D10, D2, D7) NL (D4, D10) PL (D2, D3, D5, D7) PT (D3, D4, D10, D5) RO (D3) SE (D10, D1, D3, D4) SI (D10, D8, D4)
Data, information & reporting	• Member States should fully populate e-reporting and ensure consistency between e-reporting and text report.	BE (D2, D3, D5, D7, D8, D9) CY (D3, D2, D11) DE (D3, D5, D8) ES (D2) EE (D3) FI (D3, D8, D9) LT (D2, D3)

Topics	Recommendations	Member State
		LV (D5) NL (D3, D10, D5, D9) PL (D3) PT (D5, D8, D9) RO (D3) SE (D3, D10)
	• If knowledge gaps are still substantial, Member States should develop more research efforts/ data collection to fill knowledge gaps, provide an assessment on when GES will be achieved and implement concrete management measure.	BE (D3, D4, D11) CY (D2, D10) DE (D1, D4, D2, D6, D5, D8, D9) IE (D4, D6) IT (D1, D4) LT (D11) NL (D4, D6) PT (D11, D5, D8, D9) RO (D5) SE (D1, D10, D11, D2, D4, D6) SI (D1, D11)

7.2.3 Descriptor-specific recommendations

Descriptor	Recommendations	Member State
Pollution		
Descriptor 5	• Establish more links with existing EU policies and international instruments for eutrophication, including the WFD, Zero Pollution targets and the National Emissions Ceiling Directive.	All MS except LV
	• Continue to work and strengten within the auspices of the regional sea convention, the implementation of regional measures against eutrophication.	All MS
	• Consider the need for additional measures in relation to nutrients inputs from: • agriculture and industry • aquaculture • fisheries • recreational activities • atmospheric deposition (NOx) from sea-based and land-based sources	 BE, CY, EE, FI, LV, PT CY, EE, FR, LV, SI ES, PL FR, IT BE, FI, LT, RO, SE
Descriptor 8 and Descriptor 9	• Establish more links with existing EU policies and international instruments for contaminants, and contaminants in seafood including the WFD, Zero Pollution targets and the National Emissions Ceiling Directive.	BE, CY, DE, EE, ES FI, FR, IE, IT, LT, LV, NL, PL, PT, RO, SE, SI
	• Continue to work within the auspices of the regional sea convention to ensure that regional measures against contaminants are implemented.	All MS
	• Explain the manner in which the D8 measures contribute to D9 targets including how measures will reduce levels of contaminants in fish and fish product.	DE, EE, ES, FI, FR, LV, NL, PL, PT, RO, SL
	• Improve measures for atmospheric deposition, contaminants from agriculture and contaminants from marine hydrocarbon extraction.	BE, FR, PT, RO, SE
Descriptor 10	• Establish more links with recent EU-level and regional developments and explain how measures contribute to reaching the threshold value for beach litter and Zero Pollution targets for plastic and microplastic reduction.	BE, CY, DE, EE, ES, FI, FR, IE, IT, LT, LV, NL, PL, PT, RO, SE, SI
	• Address marine litter, both in coastal areas and in the open sea, from aquaculture, urban areas, tourism and recreational activities (other than recreational fisheries), as well as the removal of existing litter	CY, EE, FI, FR, IT, LV, LT, PT, RO

Descriptor	Recommendations	Member State
	• Identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.) and takes measures to reduce the existing stock.	EE, FI, FR, LV, PT
	• Include specific measures related to litter ingested by animals especially when MS have defined targets specifically for the impact of litter on species.	CY, ES, FR, IE, IT, RO, SI
	• Address micro-litter better preferably through direct measures, in accordance with recommendations of the Technical Group on Litter.	CY, FR, IE, LT, LV, PL, PT, RO, SE
Descriptor 11	• Establish more links with existing EU policies and international instruments for underwater noise and energy, integrate the work of the regional sea conventions and build on the results of EU projects to define practical measures to achieve GES.	CY, EE, FI, FR, LV, LT, PL, RO, SI,
	• Establish direct measures to cover activities that are known to produce high levels of noise (e.g. shipping, fisheries, recreational activities, industry (oil and gas), marine research and defence operation activities), including through the establishment of low-noise areas.	BE, CY, EE, ES, FR, LT, NL, PT, SI
	• Define GES and targets for underwater noise and energy (D11).	CY, DE, EE, ES, IT, LT, LV, NL, PT, RO, SE
	• Establish measures addressing other anthropogenic inputs (e.g. heat or light) and create new measures addressing electromagnetic fields.	CY, DE, ES, FI, FR, IE, IT, LT, LV, PL, PT, SE, SI
Biodiversity		
Descriptors 1, 4 and 6	• Provide information about spatial protection measures (size, number and location of MPAs, conservation objectives, species protected, etc.) and explain how MPAs reduce pressures on biodiversity.	CY, EE, ES, FR, IE, IT, LT, LV, NL, PL, PT, RO, SE, SI,
	• Establish measures beyond spatial protection measures to ensure that pressures on biodiversity are addressed across all marine waters.	BE, CY, ES, NL, PL, PT, SI
	• Take measures covering, as appropriate, hydrocarbon extraction, port operations, land claim and coastal defence, recreational activities (e.g., fishing, vessels mooring, diving), aquaculture, industry, agriculture and urban areas.	BE, CY, DE, ES, FR, IT, LV, LT, NL, PT, RO
Descriptor 1 (specific)	• Include all biodiversity elements (species groups and habitats) in the gap analysis.	ES, IE, IT, LT, LV, NL, PT, RO
	• 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).	BE, CY, ES, FI, FR, IE, LV, NL, PT, SE
	• Establish additional measures to directly address pressures on birds, such as physical disturbances (light pollution, oil spill), disturbances on nesting sites by predation, oil spills, effects of NIS and litter ingestion, as well as measures covering birds' food sources.	CY, ES, IE, IT, LT, NL, PL, PT, RO, SI
	• Designate new MPAs including in open sea areas to protect non-commercial fish species and cephalopods from various pressures (NIS, by-catch, noise and contaminants) as well as functional fish habitats.	CY, ES, LT, LV, PL, PT, SI
	• Establish measures for plankton populations, cephalopods and turtles	CY, IT, LV, LT, PL, PT, SI
Descriptor 4 (specific)	• Include D4-food webs in the gap analysis.	BE, CY, ES, FR, IE, IT, LT, LV, NL, PT, RO, SI
	• Design D4-specific measures, for instance by reducing fishing at a certain trophic level (e.g. of forage fish, that are an important source of food for other animals).	All MS
Descriptor 6 (specific)	• Implement measures relating to bottom-towed fishing gear and /or provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.	BE, CY, DE, EE, ES, FR, IT, LT, LV, NL, PT, RO, SI

Descriptor	Recommendations	Member State
	• Take spatial and/or temporal measures to enhance the protection of mobile species which use seabed habitats (e.g. seagrass meadows) as nurseries (e.g. seasonal fishing restrictions)	All MS
	• Address also physical damage from hydrocarbon extraction, coastal development and protection, and large-scale shipping mooring.	All MS
Descriptor 2	• Make reference to recent EU-level and regional developments, such as the Commission Guidelines for sustainable aquaculture, the Regulation (EU) No 143/2014 on the prevention and management of the introduction and spread of invasive alien species and Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture.	All MS
	• Take new measures to address certain pressures and activities as pathways of introduction: aquaculture, (including seaweed farming), offshore constructions and hard structures, shipping (including hull-fouling) and recreational activities.	BE, CY, FI, FR, IE, LV, NL, PT
	• Identify where NIS are still being introduced through the gap analysis.	BE, CY, DE, EE, LT, PL
	• Develop NIS early warning systems and registries	EE, FR, NL, PT
Descriptor 3	• Cover nationally-managed stocks as well as CFP-managed stocks.	CY, DE, ES, LV, NL, PL, PT, SI
	• Cover recreational fishing activities where they exert significant pressure on commercial stocks.	CY, DE, EE, ES, FI, IE, NL, PL, PT, RO
	• Consider measures to address the shortcomings of D3 (including age/size distribution of stocks)	BE, CY, ES, FR, IT, LT, PL
Descriptor 7	• Strengthen the links between WFD and MSFD measures to address the impacts of terrestrial and marine projects and activities in coastal/shallow water areas, where most hydrographical changes are likely to occur	CY, FR, LT, LV, RO, SI
	• Strengthen regional work and cross-border cooperation on D7 including in relation to potential effects of climate change, such as changes in salinity.	BE, DE, IE, LT, LV, PL, PT, SI, SL
	• Explicitly include hydrographical conditions in EIA and SEA procedures to limit pressures on benthic habitats.	BE, DE, IE, LT, RO
	• Address cumulative impacts on habitats by multiple stressors, including marine hydrocarbon extraction, port operations, tourism and recreational activities.	CY, EE, FI, FR, IT, NL, LT, LV, NL, PL, PT, SE, SI
	• Address pressures from activities not subject to local/project scale EIAs (e.g., fishing, maritime transport).	CY, DE, ES, FR, IE, IT, LV, NL, PL, PT, SE, SI
	• Make use of the Maritime Spatial Planning Directive and SEA procedures to limit cumulative impacts, tackle hydrographical conditions at a larger scale and support the development of forward-looking scenarios	CY, EE, ES, FR, IE, LV, LT, NL, SE, SI

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
NIS	Non-Indigenous Species
OSPAR	Convention for the Protection of the marine environment of the North-east
PoM	Programme of Measures
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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