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Status Assessment 2022 - Zostera beds

Zostera beds are in poor overall status in Arctic Waters (Region I), Greater North Sea (Region II), Celtic Seas (Region III) and Bay of Biscay and Iberian Coast (Region IV) due to negative impact by multiple pressures/threats. However, the picture of changes is mixed within different OSPAR Regions and/or countries, and also depends on the timeframe of focus with severe general declines over the past century and variable development over the past decade.

While the knowledge base is increasing via national monitoring programs, e.g. in response to European directives, there are still significant data and knowledge gaps and patchy monitoring in several Regions (in particular Region I and in the southern parts of Region IV), and eelgrass maps are generally lacking. This makes it difficult to draw regional conclusions.

While key pressures are well known, the interaction of multiple pressures often makes it difficult to identify the specific cause of loss and decline.

The emerging impacts from climate change causing e.g. coastal darkening and sediment resuspension exacerbate the overall stress on *Zostera* beds and emphasizes the need to manage other stressors/threats e.g., eutrophication, trawling, coastal development, etc.

It is more important to avoid damage and to protect existing *Zostera* beds than to rely on habitat restoration.

OSPAR QSR2023

(/en/ospar-assessments/quality-status-reports/qsr-2023/)

Assessment of status		Distribution	Extent	Condition	Previous OSPAR status assessment	Status (overall assessment)
Region	I	↓	↓	↓	•	Poor[1, 5]
	II	✳	✳	✳	•	Poor[1, 5]
	III	←→	←→	←→	•	Poor[1, 4, 5]
	IV	←→	↓	←→	•	Poor[1, 4, 5]
	V					NA

⊞ Table Legend

⊞ Method of Assessment

Assessment of threats		Nutrient enrichment	Fishing pressure	Tourism and recreational activities	Changes in suspended solids	Extractions and installations	Temperature increases	Introduction or spread of non-indigenous species	Threat or impact
Region	I	↑	↓	NA	NA	↑	↑	NA	Significant threat[1, 5]
	II	✳	↑	↑	↑	←→	↑	↑	Significant threat[1, 4, 5]
	III	↑	↑	↑	?	?	↑	↑	[1, 4, 5]
	IV	?	←→	↓	?	?	↑	↑	[1, 4, 5]
	V								NA

Confidence

High – distribution and extent

Medium – condition

For threats, there is a high confidence on some topics and medium on others

Background Information

Year added to OSPAR List: *Zostera* beds were added to the OSPAR List of threatened and/or declining species and habitats in 2008 (OSPAR 2008, OSPAR 2009)

- The habitat has exhibited long-term and large-scale decline and is threatened in (at least parts of) all four OSPAR Regions (I to IV) where it occurs, with most evidence of declines from the Greater North Sea area (Region II). The basic criteria for the original nomination were decline, ecological significance and sensitivity, with information also provided on threats.
- In the previous assessment, habitat damage, nutrient and organic enrichment, hazardous substances, microbial pathogens, siltation rate changes, climate change, introduction and competition from alien species and removal of target and non-target species were all listed as factors that affect *Zostera* beds and can threaten the extent and quality of this habitat (Anon 2000, OSPAR 2009). The previous assessment highlighted that the evidence of decline in *Zostera*

beds was extensive in specific locations within the OSPAR Maritime Area, with the most detailed studies revealing a decline in the Greater North Sea area (Den Hartog & Polderman, 1975, Rasmussen, 1977, Davison & Hughes, 1998, Jones *et al.*, 2000, Baden *et al.*, 2003, Boström *et al.*, 2003). Factors that threaten *Zostera* beds were said to vary in intensity across space, but most of them occur throughout the OSPAR Maritime Area (OSPAR, 2009).

Geographical Range and Distribution

Of the two major *Zostera* species, *Zostera marina* and *Z. noltii, Z. marina* is more widespread. It has a distribution within the OSPAR Maritime Area extending from the Arctic (the OSPAR parts of Greenland are unknown with regard to *Zostera* occurrence although *Z. marina* occurs in south-western Greenland (see Olesen *et al.*, 2015 and Marbá *et al.*, 2018) down to Gibraltar (see the map). *Zostera marina* is generally found in the lower intertidal and the subtidal zone, although it can also be found in the intertidal zone in many places such as in France (Boyé *et al.*, 2021). *Zostera noltii* is less common, lives higher up on the shore compared to *Z. marina*, and does not occur further north than northern Scotland and the Bergen area in south-western Norway.

Presence/absence and areal distribution of seagrasses are commonly used indicators of status and change in distribution at the landscape scale. Colonisation depth is another useful distribution indicator (Borum *et al.*, 2004, OSPAR 2009, Marbá *et al.*, 2013), which is tightly coupled with water clarity (Duarte, 1991). Over a longer 100-year perspective, there have been huge decreases in *Zostera* distribution in the northern region including in Denmark, Sweden, Germany, the Netherlands and France (Airoldi & Beck, 2007, Boström *et al.*, 2014, Godet *et al.*, 2008, de los Santos *et al.*, 2019, Krause-Jensen *et al.*, 2021). Over a shorter 10-year perspective, there are signs of further decreases in some of the northern parts of the OSPAR Maritime Area such as in Norway and Sweden (Moksnes *et al.*, 2018, 2021, Rinde *et al.*, 2021) as well as in certain areas around the British Isles (Jones & Unsworth 2016, NPWS 2019, Green *et al.*, 2021), whereas in Denmark, Netherlands and France the distribution trend is uncertain, stable or may even display a slight increase (Wilkes *et al.*, 2017, Auby *et al.*, 2018, 2020ab, Marbá *et al.*, 2018, Zwarts *et al.*, 2018, de los Santos *et al.*, 2019, Van Deelen *et al.*, 2019, Krause-Jensen *et al.*, 2020, 2021, Aubert *et al.*, 2021ab, Aubin *et al.*, 2021, Grall *et al.*, 2021, Guerrero-Meseguer *et al.*, 2021, Hansen & Høgslund 2021, Moffat *et al.*, 2021, Naustvoll *et al.*, 2021, Ollivier *et al.* 2021, Schutter *et al.* 2021, see also the table on distribution above).

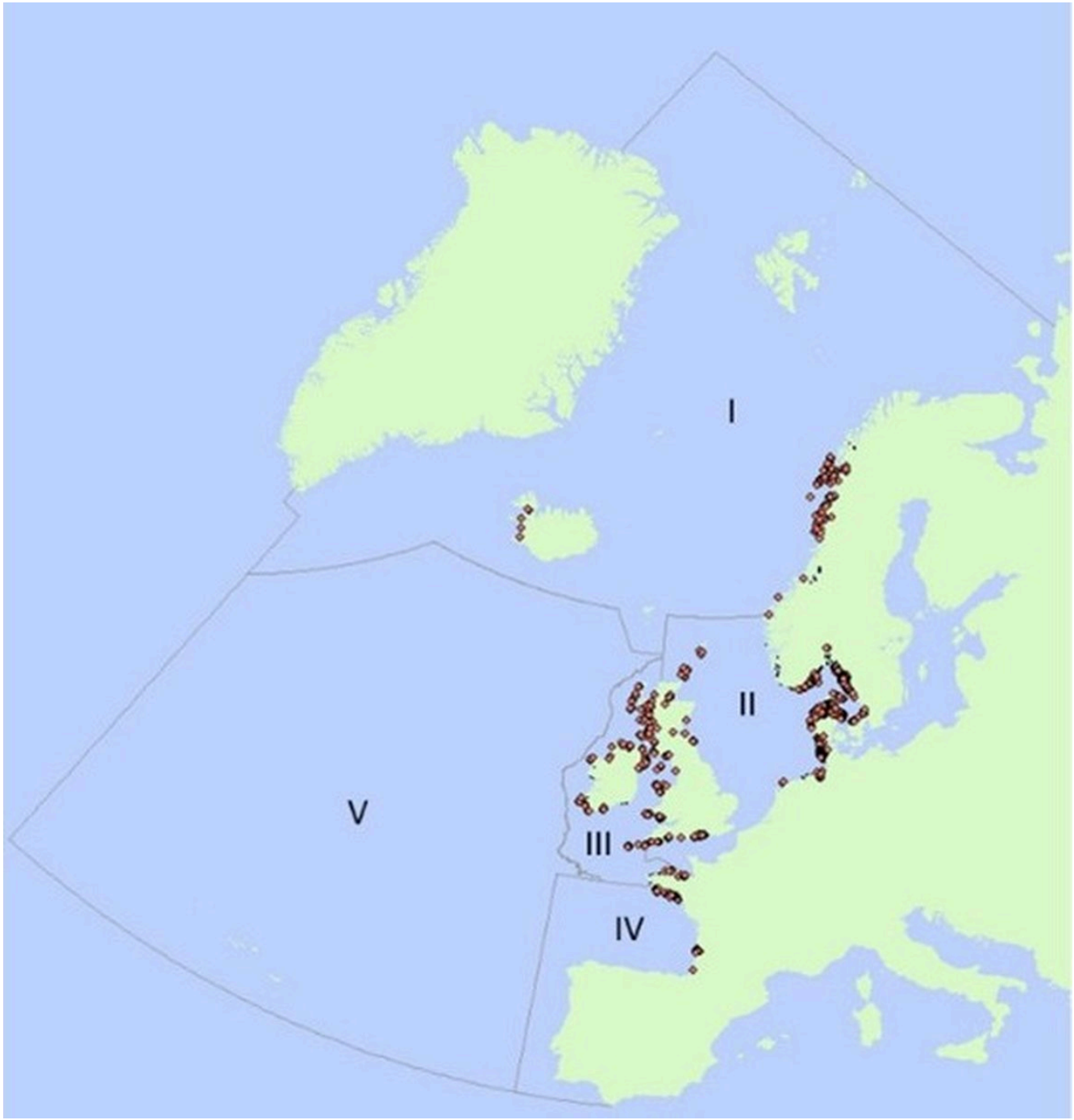

Figure 1: Documented Zostera bed distribution within the OSPAR Maritime Area. Data from OSPAR threatened and/or declining species and habitats database.
For Regions I and II: Recent information from the Nordic region and the Arctic (including the White Sea) is available in Boström et al. (2014), Krause-Jensen et al. (2020), Frigstad et al. (2021). For Spain and Portugal in Region IV, some information is available in García-Redondo et al. (2019).

Extent

Seagrass abundance/extent is often measured as coverage, biomass or shoot density, while local extent of meadows can be measured as depth limit or meadow size/area (Borum *et al.*, 2004, OSPAR, 2009, Marbá *et al.*, 2013). At a spatial scale of the OSPAR Maritime Area, there have been clear decreases in extent until the late 20th century, however more recently there have been signs of some recovery/increase e.g. in the Norwegian part of Skagerrak, Wales, Ireland and France (de los Santos *et al.*, 2019).

Over a 10-year perspective there is still evidence of clear continued decreases in extent in some countries/areas, e.g. in parts of southern Norway, Sweden and some areas around the British Isles (e.g. Jones & Unsworth 2016, Ribaudo *et al.*, 2016, Moksnes *et al.*, 2018, 2021, NPWS 2019, Green *et al.*, 2021, Rinde *et al.*, 2021), whereas in other areas, the trend differs between sites and can be characterized as uncertain, stable or in some places even showing an increase (Unsworth *et al.*, 2017, Wilkes *et al.*, 2017, Auby *et al.*, 2018, 2020ab, Burton *et al.*, 2018, Zwarts *et al.*, 2018, de los Santos *et al.*, 2019, Van Deelen

et al., 2019, Krause-Jensen *et al.*, 2020, 2021, Aubert *et al.*, 2021ab, Aubin *et al.*, 2021, Boyé *et al.*, 2021, Grall *et al.*, 2021, Guerrero-Meseguer *et al.*, 2021, Hansen & Høgslund 2021, Moffat *et al.*, 2021, Naustvoll *et al.* 2021, Ollivier *et al.*, 2021, Schutter *et al.*, 2021).

The main causes for decline are wasting-disease, nutrient enrichment, marine pollution, reduced water quality and destruction by anthropogenic activities such as construction work, mooring, anchoring and fisheries (D'Avack *et al.*, 2015, Jones & Unsworth 2016, Eriander *et al.*, 2017, Wilkes *et al.*, 2017, Branco *et al.*, 2018, Cognat *et al.*, 2018, Frigstad *et al.*, 2018, Jones *et al.*, 2018, Moksnes *et al.*, 2018, 2021, Gardiner, 2020, Ouisse *et al.*, 2020, Román *et al.*, 2020, Bertelli *et al.*, 2021, Garmendia *et al.*, 2021).

Patchy and sparse *Zostera* beds with a cover of <60% may suffer greater losses e.g. during storms than do dense, more stable uniform beds with self-protective properties (e.g., Maxwell *et al.*, 2016). While reductions in the extent of *Zostera* beds may be rapid, recolonization may require much longer time periods (Maxwell *et al.*, 2016, Moksnes *et al.*, 2018) however this depends on the species and the local context (Kilminster *et al.* 2015, O´Brien *et al.*, 2017, Boyé *et al.*, 2021). Further details on extent are given in the table above.

Condition

There is a general lack of detail with regard to *Zostera* bed condition in the OSPAR Maritime Area. The condition of *Zostera* beds is also characterized as notoriously hard to assess (Kilminster *et al.*, 2015, Boyé *et al.*, 2021). Along the coast of mid-Norway, in the Oslofjord and in certain areas around the British Isles, there are signs of decreases in *Zostera* bed condition (e.g., Jones & Unsworth, 2016, NPWS, 2019, Green *et al.*, 2021, Rinde *et al.*, 2021). The trends in condition for Sweden, Wales, Denmark are uncertain (e.g., Jones & Unsworth, 2016, Unsworth *et al.*, 2017, Bertelli *et al.*, 2021). The condition seems to be stable in Scotland, although there are examples of declines in Ireland (Region III), in the Netherlands (Region II) and in parts of France (e.g., Wilkes *et al.*, 2017, Bertelli *et al.*, 2021, Boyé *et al.*, 2021). The main causes for decline in condition are wasting-disease, nutrient enrichment, marine pollution, reduced water quality and light climate, destruction by anthropogenic activities such as construction work, mooring, anchoring, fisheries and temperature increases (Bockelmann *et al.*, 2013, Jones & Unsworth, 2016, Cognat *et al.*, 2018, Moksnes *et al.*, 2018, Ouisse *et al.*, 2020, Green *et al.*, 2021, Krause-Jensen *et al.*, 2021, Rinde *et al.*,uuuu 2021). To improve the assessment of *Zostera* bed condition, it could be relevant to carry out more scientific studies assessing ecosystem functions such as habitat provision, stimulation of biodiversity, carbon sequestration, etc. Further details on condition are given in the table above.

Threats and Impacts

Most threats to *Zostera* beds are directly linked to human activities (Elliott *et al.*, 2017). Examples of these include physical disturbance/habitat damage, marine pollution/hazardous substances, removal of target/non-target species within fisheries and increased turbidity/siltation rate changes. Further threats linked to human activities, which are even harder to manage, are large-scale nutrient/organic enrichment, non-indigenous species, microbial pathogens and climate change (D'Avack *et al.*, 2015, Jones & Unsworth, 2016, Eriander *et al.*, 2017, Wilkes *et al.*, 2017, Branco *et al.*, 2018, Frigstad *et al.*, 2018, Jones *et al.*, 2018, Gardiner, 2020, Román *et al.*, 2020, Bertelli *et al.*, 2021, Garmendia *et al.*, 2021, Krause-Jensen *et al.*, 2021).

Most of the reported threats have been increasing in most Regions/countries and are expected to continue to increase (see also the table on threats and impacts above). The effect of several stressors acting simultaneously on *Zostera* beds is quite poorly studied, but information is building (see e.g., Moreno-Marin *et al.*, 2018, Vieira *et al.*, 2020, Boyé *et al.*, 2021, Krause-Jensen *et al.*, 2021). Threats such as increased turbidity of the water/reduced light penetration and sediment resuspension can be exacerbated by climate change in the future, and climate change may also increase the need to further reduce other stressors to facilitate expansion of *Zostera* beds to deeper, cooler waters (Krause-Jensen *et al.*, 2021). Another likely effect of climate change may be an expansion of the northern distribution limit (leading edge of distribution – e.g., Greenland, see e.g., Krause-Jensen *et al.*, 2020) and contraction of the trailing edge of distribution (in Portugal/Spain).

When dealing with threats, protection and avoidance of damage to remaining *Zostera* beds is cheaper and possibly more efficient than attempting habitat restoration. Habitat restoration can be challenging, although it can be needed in some areas. For further details, see the table on threat and impact above.

Measures that address key pressures from human activities or conserve the species/habitat

Below numbered 3.1 a–k are some actions from OSPAR Recommendation 2012/04 on the protection of *Zostera* beds, and information from OSPAR implementation reporting in 2019, that to some extent have been undertaken in many Contracting Parties to OSPAR:

3.1 a. Consider the introduction of national legislation to protect *Zostera* beds
National legislation to protect *Zostera* beds has been implemented in Germany, the Netherlands, Spain, Sweden and in the United Kingdom, while Norway reports partial implementation (stronger for *Zostera noltii*). The *Zostera* beds are mainly protected by implementation of EU directives in Denmark, France and Ireland.3.1 b. Assess whether existing management measures for the protection of *Zostera* beds are effective and determine what further measures are needed to address the key threats;

OSPAR advice for additional management measures

List/Countries	Den	Fra	Ger	Ice	Irl	Net	Nor	Spa	Swe	UK
a. Consider introduction of **national legislation**			x			x	x	x	x	x
b. Assess **sufficiency of existing management measures**	x		x		x	x	x	x	x	
c. **Investigate distribution, quality and extent** of *Z.* beds	x		x		x	x	x	x	x	
d. Gather additional **knowledge from other sources**	x	x	x	x	x	x	x	x	x	X
e. **Report** any existing and new data **to OSPAR databases**	x	x					x	x	x	x
f. **Consider MPAs** for the conservation and recovery of *Z*	x	x	x		x	x		x	x	x
g. Implement **MPAs with links** between *Z.* **and threatened and/or declining species and habitats**									x	x
h. Address significant adverse **impacts on *Z.* from human activities**	x	x	x		x	x	x	x	x	x
i. **Regulate physical activities** (e.g. coastal construction)	x		x	x	x	x	x	x		x
j. **Minimise negative effects** on *Z.* when applying **coastal protection measures**	x		x	x	x	x	x	x	x	x
k. **Raise awareness of the importance of *Z.* beds**	x	x	x	x	x	x	x	x	x	x

Table 1: Summarised OSPAR implementation reporting in 2019 on the Recommendation 2012/04 for *Zostera* beds

Indirect assessments of management efficiency have been made. Denmark and Sweden have investigated how previous measures have impacted conservation by evaluating (i) the extent that MPAs had been designated for *Zostera* beds and (ii) through an analysis of legal protection. Further measures include local restoration projects in Denmark, Norway and Sweden (compilation in Krause-Jensen *et al.* submitted); special protection, monitoring and reporting in Germany; enhanced conservation status in Ireland; initiation of an agenda for management, measures, research and monitoring of seagrass in the Netherlands; regulations and instructions under the planning and building act in Norway and regional conservation plans in Spain.

3.1 c. Investigate systematically the distribution, quality and extent of *Zostera* beds, by means of seabed habitat surveys and monitoring, in order to complete the knowledge base and provide indicators for the state and recovery of the habitat;

As reported, systematic monitoring is implemented in Denmark, France, Germany, Iceland, Ireland, the Netherlands, Norway, Spain, Sweden and in the UK, although the indicator development seems to be lagging behind. There are, however, several indicators in place. In Denmark, eelgrass depth limits are used as a key indicator, while in Germany, there are also indicators reflecting the status of eelgrass. Further mapping of *Zostera* beds is needed, e.g., based on analysis of satellite images that could be repeated at regular intervals.

3.1 d. Whenever applicable seek ways and means to broaden the knowledge base on the occurrence of *Zostera* beds by gathering additional knowledge from sources such as commercial and recreational fishers, fisheries research and the general public;
As reported, efforts within this area have been taken in Denmark, Germany, Ireland, the Netherlands, Norway (only in the Oslofjord), Spain, Sweden and in the United Kingdom.

3.1 e. Report any existing and new data on the distribution, quality and extent of *Zostera* beds habitat to the OSPAR habitat mapping database;
This reporting to OSPAR is regularly implemented by Denmark, France, Norway, Spain, Sweden and the United Kingdom.

3.1 f. Consider whether any site within its jurisdiction justifies selection as a marine protected area for the conservation and recovery of *Zostera* beds;
This has been taken care of, at least to various extents, for some *Zostera* bed areas in Denmark, France, Germany, Ireland, the Netherlands, Spain, Sweden and in the United Kingdom.

3.1 g. Implement paragraph f with regards to the particular link established between *Zostera* beds and any species noted in the OSPAR List of Threatened and/or Declining Species and Habitats;
Sweden: Atlantic cod and European eel are species associated with *Zostera* beds and this is often highlighted in management plans. United Kingdom: Long and short-snouted seahorse have been designated for protection within three sites with seagrass.

3.1 h. Address any significant adverse impacts on *Zostera* beds arising from human activities in waters under its jurisdiction;
This is addressed through EU directives such as the EU Water Framework Directive and the EU Habitats Directive as well as the Marine Strategy Framework Directive and national acts and legislation at various levels in Denmark, France, Germany, Ireland, the Netherlands, Norway, Spain, Sweden and in the United Kingdom.

3.1 i. Regulate land reclamation, coastal constructions, including marinas and ports, and downscaling of water exchange between open sea and inshore shallow waters, e.g. lagoons;
As being reported from the different countries, this is regulated through the EU Environmental Impact Assessment Directive as well as the EU Water Framework Directive and the EU Habitats Directive, through strict licensing requirements or through implementation of regulations of National Park Laws or national laws in Denmark, Iceland, Ireland, Germany, the Netherlands, Norway, Spain and in the United Kingdom.

3.1 j. Adapt coastal protection measures in such a way that undesired negative effects on *Zostera* beds are minimised;
Coastal protection measures are applied in such a way that negative effects on *Zostera* beds are minimized in Denmark, Germany, Iceland, Ireland, the Netherlands, Norway, Spain, Sweden and in the United Kingdom.

3.1 k. Raise awareness of the importance of *Zostera* beds among relevant management authorities, the fishery sector and the general public. A multitude of different campaigns for various forms of awareness rising of the importance of *Zostera* beds have been done in Denmark, France, Germany, Iceland, Ireland, the Netherlands, Norway, Spain, Sweden and in the United Kingdom.

Seagrass monitoring programs could benefit from the inclusion of observations of habitat quality in addition to seagrass indicators of distribution and extent. Useful biotic indicators are presence as amounts of filamentous algae, abundance of epiphytes and key fauna. Useful environmental indicators are water quality and clarity, climatic variables (e.g., water temperature and storm frequency and intensity) and sedimentation (Borum *et al.*, 2004, OSPAR, 2009, Marbá *et al.*, 2013, Duffy *et al.*, 2019, Staehr *et al.*, 2019).

Management considerations for seagrass beds include minimising damage, avoidance of causing damage, establishment of protected areas, controlling inputs of pollutants and possible reintroduction or restoration. Promoting awareness of the importance of seagrass beds could assist in minimising certain pressures such as trampling and anchor damage. Protected areas could be designated under the OSPAR MPA-program, under the EU Habitats Directive by inclusion in the Natura 2000 network, or under national schemes such as the Marine Conservation Zones in England, Wales and Northern Ireland and Nature Conservation Marine Protected Areas in Scotland. Additionally, many other management considerations can be taken nationally and locally or settled as agreements within international co-operations such as between Denmark, Germany and the Netherlands for the Wadden Sea, which is a UNESCO World heritage site.

The assessment also brings up possible additional needs for new management measures. These include studies of changes in *Zostera* beds due to climate change and the possible increase in turbidity of the water/reduced light penetration and resuspension (e.g., due to increased storm frequencies and intensities). Also, changes in coastal development due to increased needs for coastal protection leading to increased risks for habitat loss and increased risks of coastal squeeze, i.e., the coastal zone in “built up” areas becoming narrower due to a rising sea level, may also need to be taken into consideration ensuring that the management becomes “climate ready”. The effect of eelgrass beds on coastal protection, as well as other functional aspects (biodiversity) of eelgrass beds also deserve more attention

Conclusion (including management considerations)

The status of *Zostera* beds with regard to distribution, extent and condition is poor throughout the OSPAR Maritime Area. In Norway and Sweden, and in some parts around the British Isles (Region II), there are evidence of clear decreases. In other areas, the information of trends is either uncertain or the situation is stable in recent years after years of decline, with a few areas demonstrating improved status. Examples of threats are habitat damage, hazardous substances, non-indigenous species, removal of target/non-target species within fisheries, increased turbidity/siltation rate changes, large-scale nutrient/organic enrichment, microbial pathogens and climate change. Some of these threats/pressures have increased in many Regions/countries during the past ten years and some are also expected to continue to increase over the coming years, although there are also decreasing trends for some pressures/threats possibly related to an improved management focus during the past 20 years (de los Santos *et al.*, 2019). The confidence level for the assessments of the distribution, extent and condition of the *Zostera* beds and the threats is generally at a medium to a high level.

Management considerations for seagrass beds include, amongst others: minimizing damage or avoidance of causing damage, establishment of protected areas, controlling inputs of pollutants, increasing awareness of the importance of *Zostera* beds through information and possible reintroduction or restoration. Protecting and avoiding damage to remaining *Zostera* beds is, however, cheaper and possibly more efficient than attempting expensive restoration measures with high risks of failures (van Katwijk *et al.* 2015, Moksnes *et al.*, 2018). Re-assessment of the status of and threats to *Zostera* beds should preferably be done during six year cycles.

Knowledge Gaps

The status of *Zostera* beds over the entire OSPAR Maritime Area and within different Regions/countries is very mixed/complex and this makes it difficult to reach conclusions for broad Regions. There are significant data and knowledge gaps in some Regions/countries.

Although there are many studies on *Zostera* beds and *Zostera* distribution and extent are widely mapped (see references above), there is still a poor understanding of the wider picture at a regional scale particularly in relation to trends over time and the condition of the habitat. National monitoring data are lacking from several Regions and monitoring efforts appear to be patchy making it difficult to draw regional conclusions (Jones & Unsworth, 2016, de los Santos *et al.*, 2019). There are significant data and knowledge gaps in Region I and clear gaps in the amount of reported information in Region IV. There is also a general lack of baseline data and eelgrass maps and a lack of knowledge of how different pressures may interact to disturb and damage the habitat. In addition to the human-induced threats mentioned, the extent of seagrass beds may also change due to natural factors such as severe storms, exposure to air, freshwater pulses, grazing by birds and increased seawater temperatures. Changes following human-induced threats in comparison to changes related to natural variability can also be hard to determine.

A lot of reported information is lacking for many Contracting Parties. There is some information available on records of the distribution and extent of *Zostera* beds, but the condition and the threat status are seldom known. Historical baseline data on distribution are also missing from most countries and may not exist. In order to improve the status assessment of *Zostera* beds in the OSPAR Maritime Area, each Contracting Party should provide: 1. A list of regions/locations where *Zostera* beds occur (ideally, *Zostera* maps should be made), the condition of these beds and an indication of where the beds are under threat and/or in decline. 2. A description of recent trends (i.e., recent decades and last ten years) and likely changes in extent over the next ten years. 3. A description of threats and impacts. 4. A description of any management measures to protect the *Zostera* beds and any monitoring programs. However, a great deal of this information has already been assembled and delivered by many OSPAR Contracting Parties.

Method used

Main source of information: 3 b c

1. OSPAR data assessment only
2. Assessment derived from third party assessment
3. Assessment derived from a mix of OSPAR data assessment and assessments from third parties

Assessment is based upon:

a) complete survey or a statistically robust estimate (e.g. a dedicated mapping or survey or a robust predictive model with representative sample of occurrence data, calibration and satisfactory evaluation of its predictive performance using good data on environmental conditions across entire species range);
b) extrapolation from a limited amount of data (e.g., other predictive models or extrapolation using less complete sample of occurrence and environmental data);
c) expert opinion with very limited data;
d) insufficient or no data available.

The assessment is based on a compilation of national responses to a data call (lead: Sweden, Patrik Kraufvelin) and includes regional assessment results from a consensus reaching discussion (overall assessment in the summary table) at an OSPAR workshop on *Zostera* held on October 13th 2021 as well as contributions before, during and after the POSH-meeting December 6th 2021. The following contracting parties provided national information and data used in the assessment: Denmark, France, Germany, Ireland, Norway, Sweden and UK. Many experts have given valuable input to the assessment: Clara Alvarez Alonso, Isabelle Auby, Lena Avellan, Aurelien Boyé, Florian Carius, Siri Elmegaard, Jacques Grall, Christina Halling, Marc Herlyn, Eduardo Infantes Oanes, Mikael Hjorth Jensen, Kari Holden, Martin Søndergaard Jørgensen, Jörn Kohlus, Kerstin Kolbe, Dorte Krause-Jensen*, Anna Karlsson, Flora Kent, Marie-Louise Krawack, Marie La Riviere, Natasha Lough, Susan McCambridge, Michael Mcleod, Clare McMorrow, Barbara Middleton, Chris Moulton, Miriam Mueller, Oliver Ó Cadhla, Anders

G Olsson, Antoine Pebayle, Cathrine Bøgh Pedersen, Eirik Drabløs Pettersen, Elisabeth Rosendal, Gregor Scheiffart, Steen Schwærter, Sebastian Storey, Sebastian Sundberg, Thomas Bruun Valdemarsen, Sofie Voerman, Peter Webster, Thorsten Werner, Benedikte Wiggering, Kirsty Woodcock and Claire Young.
*The Danish reporting is to a large extent based on additional revisions and information provided by Dorte Krause-Jensen after the POSH-meeting.

⊞ References

Sheet reference:

BDC2022/*Zostera*_beds