Joint HELCOM/OSPAR Task Group on
Ballast Water Management Convention (BWMC) and Biofouling
Online, 2-3 December 2021

Document title	Feedback request on the draft OSPAR thematic assessment on non-indigenous species
Code	2-6
Category	DEC
Agenda Item	2 - Feedback from Relevant Bodies, including HELCOM, OSPAR and IMO MEPC
Submission date	25.11.2021
Submitted by	OSPAR Secretariat
Reference	

Note that this document was submitted after the established deadline. It will be decided by the Meeting whether the document can be discussed or is postponed to the next meeting.

Background

Some background on the NIS Thematic Assessment and DAPSIR implementation (more background on the QSR process is available in Annex 1)

1. A thematic assessment on Non-Indigenous Species is currently being developed as part of the OSPAR Quality Status Report 2023, with Peter Staehr from Denmark as the assessment lead. As for other thematic assessments, the one on NIS will follow the template presented above and the DAPSIR framework. In other words, the NIS thematic assessment will not only look at the current state of NIS and possible environmental impacts, but will also draw links between this and the Drivers, Activities and Pressures (left hand side of the DAPSIR framework, cf. Figure 1) and possible Impact on Ecosystem Services (right hand side of the DAPSIR framework). Possible Responses should also be discussed.

2. OSPAR groups in charge of cumulative impact assessments (ICG-EcoC), and economic and social analyses (ICG-ESA), with support of the Secretariat, have developed standardised lists of terms and definitions of DAPSIR elements (Drivers, Activities, Pressures, and Impact on Ecosystem Services) to be used in OSPAR QSR 2023 thematic assessments, available on SharePoint. The objective of these lists and definitions is to improve coherence across all thematic assessments, ease referencing and reduce redundancy, and improve the online user experience on OAP.

3. On the Response section, it was agreed that biodiversity thematic assessments response chapters would be based around the HELCOM SOM process steps 1, 3 and 4.

   a. Step 1: Understanding existing measures, their implementation status and categorising these to help rationalise the number of measures being dealt with; In terms of scope a review of regional measures was felt to be appropriate for QSR. Adding national measures, could be proposed to BDC as a side-task to be done in the future, or examples could be provided to give illustrations, context.

   b. Step 3: identifying the main pathways for pressures using pressure- activity pathways. DAPSIR and Bow-tie-analysis framework is well aligned with the structure proposed to be taken for the response chapter using the HELCOM SOM steps. Developing the methodologies like this would allow for future queries of the bow-tie information on whether a measure was being implemented on the most relevant activities and whether any effect could be seen.

   c. Step 4: estimating the effects of measure types – i.e. can the measure successfully regulate the activity it is designed to restrict. It may also be possible to extend this to understanding if the

measure is succeeding in addressing the pressure – is there impact (i.e. taking into account the significance of the pressure being addressed on the state; and the scale that the measure is relevant at).

4. A contractor is engaged to develop first draft content for the Response chapters by April 2022. A task included in the project was to develop this proposal based on HELCOM SOM and develop at least some first examples. Work is currently on-going to develop first outputs based on the frameworks of steps 1,2,4. The contractor is currently developing overviews of the measures to be considered, a focus is on OSPAR measures but also some other measures are taken into account. The seven biodiversity thematic assessments will all have a chapter on Response/Measures, foreseen to be a mix of qualitative descriptive text and some measures being presented as a test case using the steps described above.

Action required

The Meeting is invited to provide feedback on elements of a draft thematic assessment on NIS being developed for OSPAR's Quality Status Assessment 2023, noting that the document will principally be of interest to the OSPAR Contracting Parties.

Feedback request on the draft OSPAR Thematic Assessment on Non-Indigenous Species

1. A thematic assessment on Non-Indigenous Species is currently being developed as part of the OSPAR Quality Status Report 2023, with Peter Staehr from Denmark as the assessment lead. As for other QSR thematic assessments, the one on NIS will follow a standard template following the DAPSIR framework. In other words, the NIS thematic assessment will not only look at the current state of NIS and possible environmental impacts, but will also draw links between this and the Drivers, Activities and Pressures (left hand side of the DAPSIR framework, cf. Figure 1) and possible Impact on Ecosystem Services (right hand side of the DAPSIR framework). Possible management Responses should also be discussed.

2. Further background information on the QSR process and thematic assessments is given in Annex 1.

3. As a group covering both the HELCOM and OSPAR Convention areas, **JTG Ballast and Biofouling is invited** to comment and provide feedback on the NIS draft thematic assessment template available in Annex 2, and more specifically to:

a) On the "Activities" section: consider the bulleted text that has been used to pre-populate this section, as disclosed in Annex 1. This current list of activities should be discussed and refined, and the group is invited to provide insight on any activities that should be added/removed from the list. Ranking these activities according to their impact magnitude is also being contemplated, and the group is invited to consider the relevance, feasibility, and possible level of ambition of this endeavor.

b) On the "Response" section: consider the draft text in Annex 2 and provide feedback on the structure and content of this section.

4. Members of the JTG Ballast and Biofouling are invited to provide their comments and feedback during this meeting, but are also welcomed to comment and provide alternative text via email or, for OSPAR Contracting Parties only, directly on the draft thematic assessment available on SharePoint. Olle Akesson (Olle.Akesson@ospar.org) could be contacted to give the necessary SharePoint credentials to OSPAR Contracting Parities experts, if need be.

5. The target date for comments and feedback is Friday 17 December 2021 at the latest.

Annex 1: Background information on the Quality Status Report 2023

Introduction to the QSR

The Quality Status Report 2023 – QSR 2023 - is a holistic assessment looking at the status of the North-East Atlantic over the period 2009-2021. The QSR 2023 is made to increase our knowledge and understanding of the status of marine environment through a comprehensive monitoring and assessment process. It will look both at the current state of the marine environment and ecosystems, and at human activities benefiting from the marine environment and interacting with it. The ultimate objective of the QSR 2023 is to provide the necessary scientific knowledge to achieve OSPAR's vision for a clean, healthy, biologically diverse sea, used sustainably. In addition, QSR 2023 may be used by Contracting Parties that are also EU Member States to support their reporting obligations under the Marine Strategy Framework Directive.

Introduction to Thematic Assessments

A thematic assessment is a higher-level product of the QSR process, which brings together, sometimes via an integrated assessment, a number of indicator assessments, other assessments, data products and other relevant information to present the evidence base for the key conclusions/statements which will be presented in the synthesis report. Thematic assessment templates have been defined and are available on the OSPAR website.

Thematic assessments will follow the DAPSIR framework. DAPSIR is a way to assess cumulative impacts at an ecosystem level and includes all types of information needed to take a holistic ecosystem-based approach to assessing a specific topic. The template that thematic assessment leads should use is based on the DAPSIR framework, and sections of the main body of the text of the thematic assessment mirror the underlined boxes of the below schema.

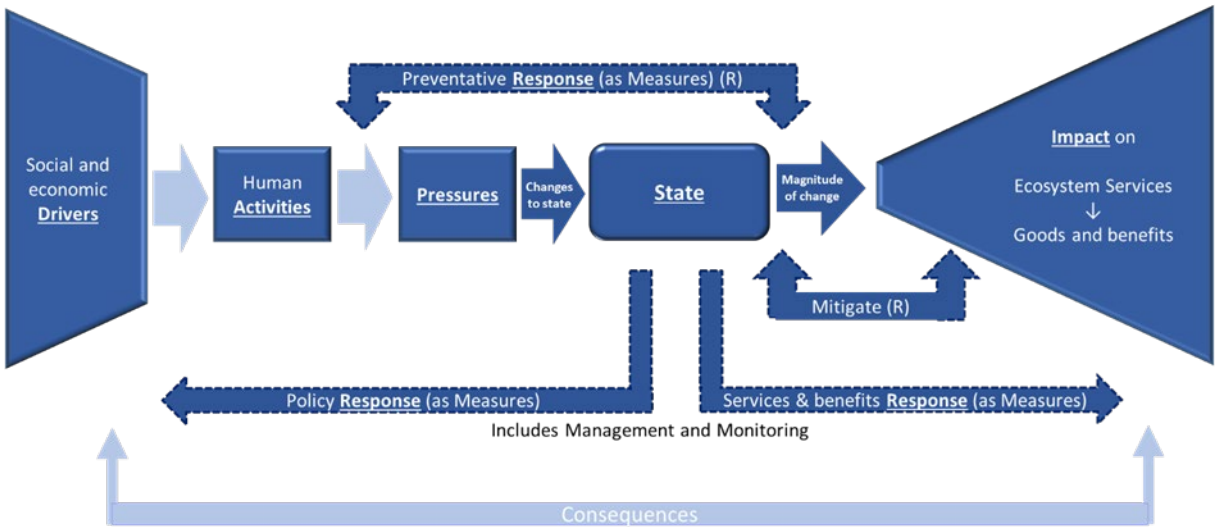

Figure 1. Framework to underpin thematic assessments[1]. This schema is compatible with the European Commission Staff Working Document DAPSES-MMM framework and was developed by OSPAR's ICG-EcoC.

There will be differences in the scope and technical implementation of the thematic assessments. The amount of information under each section of the DAPSIR structure within the thematic assessment

template will differ between thematic assessments. For example, biodiversity thematic assessments are foreseen to include the majority of the content, including results from integrated assessments, under the chapter 'Status', whereas a hazardous substances thematic assessment would include the majority of content under the chapter 'Pressures'.

Thematic assessments will be online product, made to be publicly available on the OSPAR Assessment Portal (OAP).

Annex: NIS draft thematic assessment, extracted from OSPAR QSR SharePoint (22/11/2021).

Please consult the associated guidance document (updated 25/05/2021) for more information on how to populate this template and associated content, including all the elements of the DAPSIR framework, the Bow-Tie Analysis, and the section on climate change.

Please Note: The Thematic Assessment and accompanying Bow Tie Analysis are ongoing pieces of work and should be regarded as draft. There may be areas and linkages that have not yet been identified. These will be added as the expert groups review and update the thematic assessments. Work on identifying the responses, management measures and impacts on ecosystem services has recently started. The thematic assessments and bow tie analysis will be updated with the outputs as they become available.

QSR template for Thematic Assessments

SUBMITTING THEMATIC ASSESSMENT MATERIAL

In order to assist the Secretariat in producing the online layout of the thematic assessment, information should be submitted in the following **MS Word** document template.

The thematic assessment template includes an **excel** Addendum for summary results of relevance to those Contracting Parties that are also EU Member States. The addendum is to be completed by the thematic assessment experts and provided to the Secretariat.

Thematic Lead(S)	Cefas contact	Last updated
Peter Staehr (DK) pst@bios.au.dk	Shannon White Shannon.white@cefas.co.uk Frances Mynott (on maternity leave) France.mynott@cefas.co.uk	22/10/2021

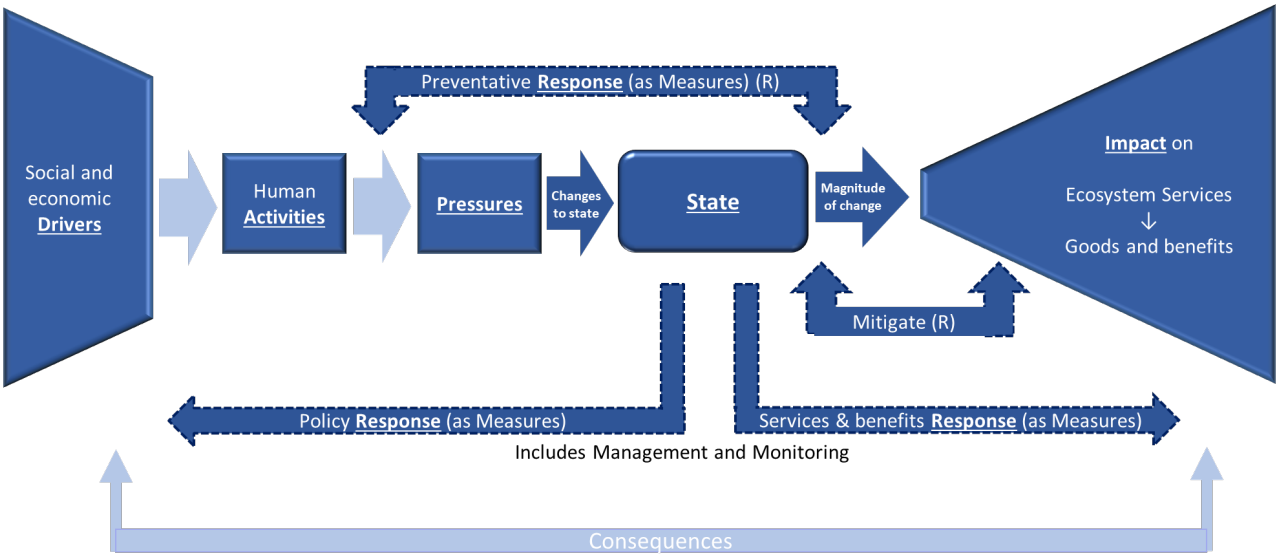

Figure 1. Framework to underpin thematic assessments[1]. This schema is compatible with the European Commission Staff Working Document DAPSES-MMM framework.

The boxes underlined in Figure 1 correspond to DAPSIR elements or chapters that will have to be populated at the level of thematic assessment – see below.

Content

Field name	Data type: text
	NOTE: [The executive summary should pull together the key findings from the main body of text. It should provide a generic introduction, highlight particular issues and areas of interest and ensure continuity with the QSR 2010. It should make clear the link between DAPSIR components and the answers to the five questions. This box should contain a brief overview (300 words).]
	Q1. Identify the problems? Are they the same in all OSPAR regions?
	Q2. What has been done?
	Q3. Did it work?
	Q4. How does this field affect the overall quality status?
	Q5. What do we do next?
Body Text	[Heading]
D - Driver(s)	[Heading]
	[Chapter summary for the OSPAR Maritime area]

[1] **(Developed by Cefas (Judd & Lonsdale, 2021) within the OSPAR ICG-EcoC - this amalgamates thinking from NCC[1] , UK NEA[1] , Elliot et al.,2017[1] , Hooper et al., 2019[1] , Maes et al., 2013[1] , CICES[1])**

	NOTE: to be populated towards the end of drafting based on extracts from the Driver(s) [Content] narrative.
	The social and economic drivers behind the human activities affecting the input, further spread and establishment of non-indigenous species (NIS) are: • **Industry:** Industrial economies • **Urbanisation:** Growing population - demand for housing and utilities • **Energy security:** Growing population - demand for energy, low carbon economies, renewable energy targets, oil and gas part of energy mix (albeit declining), nuclear energy in some countries, managing emissions, energy prices • **Economic Development:** Political and economic autonomy, international trade (goods and services) - imports and exports, foreign aid, tariffs and grants, international agreements, stocks and market prices, tourism • **Climate Change Mitigation:** Coast and flood protection, constructions designed to withstand extreme weather events, reductions in fossil fuel consumption (and extraction), reductions in greenhouse gas emissions, push towards renewable energy technologies, assessment of biodiversity changes • **Food Security:** Growing population - demand for food, diet shifts, global food chains, regulation, innovation, international trade, political stability, culture, international collaboration, food prices • **Societal Wellbeing:** Cost of living, environmental awareness, health of population, demands for goods and services, accessibility of goods and services (convenience), communications, socio-economic status (regional / national differences), culture, historic environment, tourism and recreation, pandemics • **Trade & Transport:** Supply and demand of goods and services; national and international targets, tourism • **National Security:** National military defence policies and programmes; geo-political threats **NOTE:** Please consult the associated thematic assessment template guidance document.
A – Activity(ies)	[Heading]
	[Chapter summary per [OSPAR Region] or [OSPAR Maritime area]] Region I | Region II | Region III | Region IV | Region V **NOTE**: to be populated towards the end of drafting based on extracts from the Activity(ies)[Content] narrative.
	• **Industrial uses [Urban and industrial uses]:** Factories in operations can produce emissions, waste, e.g. Drivers for industrial uses are trade and transport, economic development, industry, and urbanisation. Localised temperature changes associated with industrial inputs (e.g. water used as a coolant) may alter habitat suitability for marine organisms, including non-indigenous species.

- **Waste treatment and disposal [Urban and industrial uses]:** For example: Sewage and surface water effluent. Drivers for waste treatment and disposal are industry, urbanisation, and societal wellbeing. Localised temperature changes associated with wastewater inputs (e.g. urban runoff) may alter habitat suitability for marine organisms, including non-indigenous species.

- **Non-renewable energy generation [Production of energy]:** Nuclear power generation stations, typically located on coast. Some form of cooling water intake/outfall is usually present, often with pipes running into the sub-tidal. (Not listed by MSFD or JAMP). Drivers of nuclear energy generation are climate change mitigation, economic development, energy security, and societal wellbeing. Localised temperature changes associated with power station inputs (e.g. water used as a coolant) may alter habitat suitability for marine organisms, including non-indigenous species.

- **Extraction of oil and gas, including infrastructure [Extraction of non-living resources]:** Activities associated with the extraction of marine hydrocarbons including exploration, construction, operation and decommissioning (JNCC, 2019). Economic development and energy security are drivers for oil and gas as part of energy mix (albeit declining). The need for energy security has meant that oil & gas development has remained constant in most areas, although there are decreases in some areas. The addition of infrastructure associated with oil and gas extraction to the marine environment can introduce hard substrate for colonisation by marine organisms, including non-indigenous species. Shipping oil and gas can also translocate non-indigenous species (see Transport - Shipping below).

- **Renewable energy generation (wind, wave and tidal power), including infrastructure [Production of energy]:** The construction and operation of offshore wind farms, and other renewable energy developments designed to harness wave energy and tidal energy, including associated infrastructure (JNCC, 2019). Energy security, economic development, and climate change mitigation are drivers for renewable energy generation. The addition of infrastructure associated with renewable energy generation to the marine environment can introduce hard substrate for colonisation by marine organisms, including non-indigenous species.

- **Aquaculture - marine, including infrastructure [Cultivation of living resources]:** Growing of finfish in cages/nets suspended from surface structures or lines, which may be anchored to the seabed. Seaweed grown on ropes/nets suspended from surface structures or lines, which may be anchored to the seabed. Relaying and harvesting of shellfish (e.g. mussels, oysters, scallops) on suitable areas of intertidal and subtidal substrate, including dredging for seed. Shellfish (mussels, oysters) grown on ropes/nets suspended from surface structures or lines. These structures may be anchored to the seabed. Shellfish (e.g. oysters) grown on racks or trestles in the intertidal zone. JNCC (2019). Aquaculture is driven by the need for food security. Non-indigenous species may be cultivated and the addition of infrastructure associated with aquaculture to the marine environment can introduce substrate for colonisation by marine organisms, including non-indigenous species.

- **Aquaculture - freshwater [Cultivation of living resources]:** Cultivation of aquatic organisms where the end product is raised in freshwater, such as reservoirs, rivers, lakes, canals and groundwater. Earlier stages of the life cycle of these aquatic organisms may be spent in brackish or marine waters. (FAO, 2021) Aquaculture statistics | Coordinating Working Party on Fishery Statistics (CWP) | Food and Agriculture Organization of the United Nations (fao.org)). Aquaculture is driven by the need for food security and non-indigenous species may be cultivated.

- **Hunting and collecting for other purposes [Extraction of living resources]:** Hunting and gathering/ collecting of living resources for other purposes (subsistence use), such as

	subsistence hunting of marine mammals (JNCC, 2019). Could also include ornamental fish collection, bait digging (for fishing), medicinal/cosmetics. Societal wellbeing is a driver for ornamental collection, bait digging, and medicinal/cosmetics and these activities may involve the use of non-indigenous species. • **Tourism and leisure infrastructure [Tourism and leisure]:** Infrastructure to support maritime activities (coastal based and at sea based), which are undertaken for the purpose of enjoyment, amusement or pleasure. Examples of infrastructure include moorings, coastal footpaths, buildings e.g. hotels, restaurants, leisure centre. JNCC (2019). Societal wellbeing is the main driver for tourism and recreation. The addition of infrastructure associated with tourism and leisure to the marine environment can introduce substrate for colonisation by marine organisms, including non-indigenous species. • **Tourism and leisure activities [Tourism and leisure]:** Any maritime activity (coastal or at sea) that is expressly undertaken for the purpose of enjoyment, amusement or pleasure. Examples include boating, yachting, diving etc. (JNCC, 2019). Societal wellbeing is a driver for tourism and recreation. Marine organisms may be transported between locations by the movement of boats, equipment, and people (e.g. intentional release of unused fresh bait from recreational fishing; on clothing), which can include non-indigenous species. • **Transport – shipping [Transport]:** The passage or transport of vessels at sea, including people, goods and freight in the marine environment. JNCC (2019). Trade and transport and national security are drivers of shipping activity. Shipping can transport marine organisms between locations, for example in the ballast water or attached to ship hulls, which can include non-indigenous species. • **To add Education and Research?** • **Climate change [see corresponding thematic assessment]:** Numerous drivers and activities (e.g. burning of fossil fuels, agriculture, deforestation) contribute to climate change, with associated pressures linked to the distribution and abundance of non-indigenous species. **NOTE:** Please consult the associated thematic assessment template guidance document.
P – Pressure(s)	[Heading]
	[Chapter summary per [OSPAR Region] or [OSPAR Maritime area]] Region I | Region II | Region III | Region IV | Region V | | | | | **NOTE**: to be populated towards the end of drafting based on extracts from the Pressure(s)[Content] narrative.
	[Content] • **Input of other forms of energy (including electromagnetic fields, light and heat) [Substances, litter and energy]:** Events or activities increasing or decreasing local water temperature. This is most likely from thermal discharges, e.g. the release of cooling waters from power stations. This could also relate to temperature changes in the vicinity of operational subsea power cables. This pressure only applies within the thermal plume generated by the pressure source. It excludes temperature changes from global warming which will be at a regional scale (and as such are addressed under the climate change pressures). Industrial uses (driven by trade and transport, economic development, industry, and urbanisation), waste treatment and disposal (driven by industry, urbanisation, and societal wellbeing) and non-renewable energy generation (driven by energy security, climate change mitigation, societal wellbeing, and economic

development) can result in the input of heat to the environment (e.g. from coolant water or urban runoff). Localised temperature changes may alter habitat suitability and influence the distribution and abundance of non-indigenous species.

- **Input or spread of non-indigenous species [Biological]:** The direct or indirect introduction of non-indigenous species, e.g. Chinese mitten crabs, slipper limpets, Pacific oyster and their subsequent spreading and out-competing of native species. Ballast water, hull fouling, stepping-stone effects (e.g. offshore wind farms) may facilitate the spread of such species. This pressure could be associated with aquaculture mussel or shellfishery activities due to imported seed stock or from accidental releases. The introduction of infrastructure to the marine environment can introduce hard substrate for colonisation by non-indigenous species. This can include for oil and gas extraction and renewable energy development, driven by energy security and economic development, with climate change mitigation as another driver for renewable energy. Food security and societal wellbeing also drive the introduction of infrastructure to the marine environment for aquaculture and tourism and leisure, respectively. Boating for tourism and leisure and shipping, driven by trade and transport and national security, can result in translocation of non-indigenous species when the hulls or other structures are fouled. The ballast water of ships is also a pathway for the translocation of non-indigenous species. Escapes and/or releases of non-indigenous species can result from aquaculture and the cultivation of non-indigenous species and activities driven by societal wellbeing, such as the aquarium trade or zoos, and recreational activities such as the release of unused fresh fishing bait (e.g. slipper limpets) or translocation on recreational equipment and clothing.

In addition, the effects of non-indigenous species are increased by pressures from:

- **Climate change [see corresponding thematic assessment]:** Numerous drivers and activities (e.g. burning of fossil fuels, agriculture, deforestation) contribute to climate change, with associated pressures (e.g. change in sea temperature) linked to the distribution and abundance of non-indigenous species.

- **Marine litter [see corresponding thematic assessment]:** Marine litter also contributes to the input/spread of non-indigenous species by providing artificial substrate that can transport non-indigenous species from location to location.

NOTE: Please consult the associated thematic assessment template guidance document.

S – State

[Heading]

[Chapter summary per [OSPAR Region] or [OSPAR Maritime area]

Region I	Region II	Region III	Region IV	Region V

NOTE: to be populated towards the end of drafting based on extracts from the State [Content] narrative.

[Content]

The unwanted state is the increase in abundance/distribution of NIS.

- The state is measured using the following indicator: Trends in New Records of Non-Indigenous Species Introduced by Human Activities (NIS3)

The environmental impacts related to the unwanted state are:

- Increased disease spread from NIS

<table>
<tr><td></td><td>
NIS outcompete native species
Objective (Top Event): to avoid (or reduce) introduction of NIS/INS and translocations of NIS/INS, caused by the collective pressures from human activities (i.e. to achieve and maintain GES).

Environmental Impacts

The pressures from human activities collectively contribute to introduction of NIS and translocations of NIS in the North East Atlantic with impacts of:
NIS outcompeting native species
Increased disease spread from NIS
The magnitude of these changes has implications for ecosystem services, e.g.
Species extinctions
biodiversity loss / decline;
food web structure changes;
reductions in biodiversity;
NOTE: Please consult the associated thematic assessment template guidance document.
</td></tr>
<tr><td rowspan="3">I – Impact (on Ecosystem Services)</td><td>[Heading]</td></tr>
<tr><td>[Chapter summary per [OSPAR Region] or [OSPAR Maritime area]]
<table>
<tr><td>Region I</td><td>Region II</td><td>Region III</td><td>Region IV</td><td>Region V</td></tr>
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</table>
NOTE: to be populated towards the end of drafting based on extracts from the Impact [Content] narrative.
</td></tr>
<tr><td>[Content]

Text extracted from the ICG-EcoC bow tie analysis:

The pressures from human activities collectively contribute to introduction of NIS and translocations of NIS in the North East Atlantic with impacts of:
loss to society (ecological and socio-economic value);
increased costs of monitoring and removal.
Consequences

Text extracted from the ICG-EcoC bow tie analysis:

The use of measures to prevent or mitigate (or compensate) for these impacts can have implications for the social and economic drivers behind the human activities, e.g.
increased energy prices,
reduced energy security,
reduced food security,
</td></tr>
</table>

	• reduced capacity to address climate change. **NOTE:** Please consult the associated thematic assessment template guidance document.
R – Response	[Heading]
	[Chapter summary for the OSPAR Maritime area] **NOTE**: to be populated towards the end of drafting based on extracts from the Response [Content] narrative.
	[Content] Link to collation of existing measures **Chapter Overview/ chapeau** • Some comment on scope of the chapter and overview by region • Linkages to other thematic assessments: (Benthic, food webs, pelagic?) • Links to feeder reports relevant to the Pathways of NIS spread (shipping, aquaculture, renewables) 1. **Measures adopted within the context of OSPAR** Four of the POSH recommendations specify actions relating to NIS (e.g. flat oyster, salmon, sturgeon, littoral chalk communities) **Marine Protected Area Network:** MPAs are generally not a response to address the spread or establishment of NIS. [CHECK: there are no examples within the OSPAR MPA network where management objectives explicitly identify NIS management] However there may be management actions within protected areas that are important (e.g. the protection of seabird nesting grounds through predator eradication programmes) 1. **OSPAR measures and management responses that respond to specific activities and pressures (within OSPAR''s mandate to regulate)** a. Review the collation of measures OSPAR /HELCOM joint procedure wrt the BWC 2. **Other important measures to address impact from other activities and pressures that are outwith OSPAR's mandate to regulate** Review collation of measures Global: Invasive alien species have been identified as one of the key causes of loss of native species and harm to bio-diversity. Under Article 8(h) of the Convention on Biological Diversity (CBD), to which the Community is a Party, e IMO Ballast Water Management Convetion (2004) : aims to prevent the potentially devastating effects of the spread of invasive species carried by ships' ballast water from one region to another. This is be done through the strict control and management of ships' ballast water and sediments. The entry into force of the BWM Convention is a crucial step towards the reduction of the spread of non-indigenous species regionally and worldwide.

Regional e.g.

a. MSFD: Descriptor 2 - "Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems"
b. EU Biodiversity Strategy
c. EU Alien Species Directive

EU 2007 regulation concerning use of alien and locally absent species in aquaculture https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R0708

National: to what extent do OSPAR Contracting Parties have biosecurity plans in place?

[note for memory and testing with the DK action plan – question is to what extent are national biosecurity plans being used as a management tool within the OSPAR maritime area:

Test Outline for a summary for National Biosecurity
Title of the national biosecurity plan:
Link:
Responsible authority(ies) for implementing the plan: *comment if there is someone with particular responsibility for marine NIS*
Year adopted/ duration of the plan: *will the plan be revised? is it for a certain period?*
Legal status: *has the plan been implemented in relation to any national legislation or international obligations under the EU? (e.g. as an MSFD PoM, AIS Directive) or under the CBD Decision VI/23 relating to AIS; other?*
Scope of the plan: *i.e. comment on whether the plan includes marine NIS, to what extent is the marine environment taken up in the plan?*
What type of actions will be undertaken with respect to the marine environment or with respect to marine vectors for NIS?]

b. How is OSPAR engaging with these?

3. **Regional differences**

4. **Gaps and opportunities**
   c. How measures relate to identified DAPs
   d. Link to continued provision of ecosystem services

Active restoration to address the impact of NIS? - what is best practice in restoration and implications for NIS. Noted that measures to prevent potential spread of NIS and reduction of spread. Once established, erradication of NIS is not successful

Consider: renewables construction is considered to have a positive benefit to biodiversity in soft bottomed habitats by providing hard substrate on which organisms can settle. However there is also a potential for the submerged structures to act as stepping stones for the spread of NIS, and / or expand the distributional range and facilitate spread.

There are measures that can be taken to reduce the likelihood, e.g. in the consideration of the types of construction materials that are used.

Link>> new ICG on renewables under the new NEAES for consideration of possible measures with respect to windfarm development as a vector for NIS spread

	Text extracted from the ICG-EcoC bow tie analysis [to be updated] ➢ Measures are in place to prevent (or reduce) the introduction of NIS and translocations of NIS e.g. • Legislation and regulations (Ballast water convention; EU Regulation (1143/2014) on invasive alien (non-native) species; MSFD • Biosecurity Plans • Prevention of introduction through biosecurity/ pathway management. • Public awareness raising and education • Surveillance and monitoring to aid rapid response and containment ➢ Measures are in place to mitigate for the introduction of NIS and translocations of NIS e.g. • Developing detection and control methods • Removal/eradication • Monitoring/surveillance (statutory, eNGO/ citizen science programmes) ➢ Which human activities (and associated pressures) should new / improved measures be applied / prioritised, i.e. • Climate Change? • Offshore Renewable Energy Development (ORED)? • Offshore Structures, e.g. oil and gas? • Tourism and leisure? • Shipping? • Aquaculture? **NOTE:** Please consult the associated thematic assessment template guidance document.
Bow-tie analysis	[Content] **See Annex 1** **NOTE:** Please consult the associated thematic assessment template guidance document.
Climate change	[Content] **Note on the process:** The Climate Change Expert Group are developing the climate change thematic assessment and request that all other thematic assessments contribute in responding to questions, as below, for each of the parameters assessed in QSR 2010 tables 3.1 and 3.2 (https://qsr2010.ospar.org/en/ch03_01.html). In the

prepopulated templates provided to assessors, the Secretariat has listed the proposed parameters for each thematic assessment.

QSR 2010			QSR 2023			
Impact	**What might happen**	**What has been observed**	**Did the foreseen change happen?**	**How has the change happened?**	**What has been the impact?**	**Confidence (guidance document annex 1)**
Non indigenous species	Increased invasions and establishment may be facilitated by climate change and pose a high risk to existing ecosystems	Establishment of Pacific oyster and the barnacle *Elminius modestus* has been linked to climate change	[Yes/No/Not possible to know] [Comment]	[faster/slower than anticipated, more drastic/very mild change] [Comment]	[strong negative / mild positive etc] [Comment]	Evidence [Robust/medium/limited] Degree of agreement [High/medium/low] Has confidence increased over 10 years? [Yes/No] [Comment]

THEMATIC METADATA

Field	Data Type	Explanation
Summary Results (template Addendum 1)	URL	Link to MSFD results table,including: Descriptor, Criterion, GESComponent, Feature, Marine Reporting Units, etc.
Contributor	Text	Lead author organisation / Individual name
Linkage	URL	Weblinks to additional information about the assessment e.g. link to Publication, common indicator agreement Where available links to other references, e.g. scientific journal papers, can be provided. The items in the list should be line-separated
Relevant OSPAR Documentation	Text	OSPAR-relevant Publication, Decision, Recommendation or Other Agreement. Use the following naming protocols: [OSPAR Publication] [YYYY]- [publication number] [title] [OSPAR Recommendation] [YYYY]-[number] [title] [OSPAR Decision] [YYYY]-[number] [title] [OSPAR Agreement] [YYYY]-[number] [title] For example: OSPAR CEMP Guidelines e.g. Agreement 2016-09 CEMP Guideline: Common Indicator – Marine Bird Abundance (B1) OSPAR Publication 2008-379 CEMP Assessment Manual: Coordinated Environmental Monitoring Programme Assessment Manual for contaminants in sediment and biota OSPAR Recommendation 2015-04 on furthering the protection and conservation of the Allis shad (Alosa alosa) in Regions II, III and IV of the OSPAR maritime area OSPAR Decision 2012-1 on the establishment of the Charlie-Gibbs North High Seas Marine Protected Area OSPAR Agreement 2004-15 Provisional JAMP Assessment Criteria for TBT – Specific Biological Effects. Amendments agreed by ASMO 2008

Additional Guidance for completion

Figure/Table naming

The numbering of the figures/tables/formulae/charts etc. in the "brief" sections, will follow a Figure 1, Figure 2, Figure 3, etc. structure;

For the online only "extended" sections, the figure/table numbering will follow a Figure a, Figure b, Figure c, Table a, Table b, etc. structure.

To be supplied to the Secretariat in a zip file.

Photos

As jpeg A minimum of 2 photographs should be supplied and all photos must be fully accredited with permission for publication and online use. If no accreditation is necessary, please make this clear. Images must be at a resolution of 300dpi and in jpeg format – screenshots are not suitable

Graphs

As jpeg All graphs need to have clear, brief titles and be provided as a high-resolution jpeg. All data used to make the graph must be supplied in Excel or readily accessible format

Formulae

As jpeg For example

$$y_t = \frac{1}{n_t} \sum_i c_{ti}$$

Tables

As Excel file

All tables need to have a clear, brief title. All data used to make the table must be supplied in Excel or Word format.

Infographics

As jpeg All infographics need to have a clear, brief title and be provided as a high resolution jpeg. All information used to make the infographic must be provided in a suitable and accessible format.

Maps

As jpeg

All maps need to have a clear, brief title. All background data used to make the maps, such as shapefiles, need to be supplied in the assessment snapshot data package.

Use of language

Scientific names – try to avoid using scientific names if at all possible. If this is not possible, be consistent e.g. do not use scientific names in tables and common names in text. Scientific names can be used in the extended online text, provided the common name is referenced in the first instance it is used. In translating between scientific and common names use the World Register of Marine Species, available from http://www.marinespecies.org/.

Avoid acronyms or explain them – avoid the use of acronyms in the summary text, in the extended text they can be used but written in full in their first instance.

Referencing

References should be placed within the references section using the following layouts for peer reviewed and grey literature publications respectively:

Author, X.Y., Date YYYY, Title. Organisation or Journal, Location, Number of pages (e.g. 123 pp) or pages (12- 15)

Title. Organisation, Location, date YYYY. Publication Ref. Number of Pages