

# Action Plan for the further implementation of habitat and food web indicators and progressing integrated assessments in OSPAR (sub) regions

EcApRHA Deliverable WP5.6



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## EcApRHA

The EcApRHA project (Applying an Ecosystem Approach to (sub) Regional Habitat Assessment) aims to address gaps in the development of biodiversity indicators for the OSPAR Regions. In particular, the project aims to overcome challenges in the development of indicators relating to the MSFD (Marine Strategy Framework Directive 56/2008/EU), such as Descriptor D1 (Biodiversity), D4 (Food webs) and D6 (Seafloor integrity), and to deliver an action plan to OSPAR that will enable monitoring and assessment at the (sub) regional scale, to contribute to OSPAR Intermediate Assessment 2017.

Indicators related to the benthic and pelagic habitats, as well as food webs, are investigated within the project at different levels (from data to indicator; from indicator to habitat assessment; from habitat to ecosystem assessment).

## Acknowledgment

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## Disclaimer

This deliverable reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

## Acronyms

BDC	OSPAR Biodiversity Committee
BH1	OSPAR candidate benthic habitat indicator (Typical species composition)
BH2	OSPAR common benthic habitat indicator (Condition of Benthic habitats: Multi-metric indices)
BH3	OSPAR common benthic indicator (Physical damage of predominant and special habitats)
BH4	OSPAR candidate benthic indicator (Area of Habitat loss)
CEMP	OSPAR's Coordinated Environmental Monitoring Program: technical specifications report
EcApRHA	"Applying an ecosystem approach to (sub) regional habitat assessments (EcApRHA): addressing gaps in biodiversity indicator development for the OSPAR Region from data to ecosystem assessment"
ENA	Ecological Network Analysis
EU MSFD	European Union Marine Strategy framework Directive( 2008/56/EC)
EUNIS	European Nature Information System habitat classification
FW2	OSPAR candidate food webs indicator (Production of phytoplankton)
FW4	OSPAR common food webs indicator (Changes in average trophic level of marine predators (cf mean Trophic Level)
FW6	OSPAR candidate food webs indicator (Zooplankton community size structure in relation to biomass/abundance)
FW7	OSPAR candidate food webs indicator (Biomass and abundance of functional groups)
FW9	OSPAR candidate food webs indicator (Ecological Network Analysis)
GES	Good Environmental Status
ICG-C	Intercessional Correspondence Group on cumulative effects
ICG-COBAM	Intercessional Correspondence Group on the Coordination of Biodiversity and Monitoring
ICES	The International Council for the Exploration of the Sea
JAMP	OSPAR Joint Assessment & Monitoring Programme
MTL	Mean Trophic Level
NEAT	Nested Environmental status Assessment Tool
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
PH1/FW5	OSPAR common pelagic habitat indicator (Changes of plankton functional types (life forms) index Ratio)
PH2	OSPAR common pelagic habitat indicator (Plankton biomass and/or abundance)
PH3	OSPAR common pelagic habitat indicator (Changes in biodiversity index)
QSR	OSPAR Quality Status Report

RSC	Regional Sea Convention
VMS	Vessel Monitoring System

## 1. Purpose of the Action Plan

The Action Plan presents recommendations from the EcApRHA project (Applying an Ecosystem Approach to (sub) Regional Habitat Assessment) that can be used to progress OSPAR's biodiversity monitoring and assessment towards the next Quality Status Report assessment and in its regional coordination role in support Contracting Parties' implementation of the EU MSFD. It focuses on how to measure change in benthic and pelagic habitats and food webs within the OSPAR maritime area. It presents a number of gaps identified as a result of the work of EcApRHA and recommendations for actions on how to address these gaps could be addressed by OSPAR in order to progress indicator development, integration approach development and improve the ecosystem approach for (sub) regionally coherent habitat and food web assessment, monitoring and further understanding of Good Environmental Status.

## 2. Organisation of the Action Plan

The Action Plan is organised into four sections:

**SECTION I** provides the brief background and rationale for the Action Plan, sets the objectives, regional application and identifies the supporting documents for further implementation of the Action Plan.

**SECTION II** presents the actions that are recommended for further implementation. The actions have been grouped into seven themes as follows:

1. Retention of expertise
2. Methodology and monitoring
3. Data
4. Reference conditions
5. Thresholds
6. Assessment
7. Integration

**SECTION III:** presents recommendations on how the Action Plan could be coordinated and implemented. It describes where there are links needed between the different OSPAR subsidiary bodies in order to successfully implement the plan. It explains how this Action Plan connects and supports major OSPAR programmes and future assessments. In addition, it highlights the relevance to the work of other Regional Sea Conventions (RSC). It also proposes potential monitoring, reporting and review options for OSPAR within the further implementation of the plan.

**SECTION IV:** shows the links and direct connection to the detailed content that supports the Action Plan including additional technical reports and draft OSPAR documentation, which are an essential reference point in the implementation of the plan.

## SECTION I:

### 3. Background and Rationale

OSPAR has so far adopted a set of 16 common biodiversity indicators and identified a set of candidate indicators that require further development before they can be operationalized. The current set of biodiversity indicators adopted as common in the North-East Atlantic under OSPAR were missing some key elements necessary for their regional application, in particular related to habitat (benthic and pelagic) and food web indicators. In addition to that, a number of candidate indicators with high potential to contribute as common indicators, needed further analysis and testing in order that they could be considered for use in (sub) regional assessments.

The European Commission Article 12 report (COM(2014) 97 final) on the first phase of implementation of the EU MSFD identified that the initial assessments by member states under Article 8 of the directive often provided only a fragmented overview of the state of the marine environment. It also stressed the lack of coherence and adequacy in how countries (especially neighbouring countries) performed their assessments or defined GES. There was a clear need expressed to focus the project on further development of approaches and actions to address the challenges that had been identified in order to be able to use common indicators at a regional scale to support EU legislation.

Within OSPAR, the Intersessional Correspondence Group on Coordinated Biodiversity Monitoring and Assessment (ICG-COBAM) group identified that the least developed biodiversity indicators within the North-East Atlantic are pelagic, benthic and food webs. These are the least visible or understood components of the marine ecosystem and less instantly attractive to public. Despite this, pelagic and benthic habitats are at the base of marine food webs and play a key role in the ecosystem functioning and the sustainability of the marine ecosystem.

#### *Why is the Action Plan needed and what will it provide?*

This Action Plan picks up specific elements of the OSPAR biodiversity monitoring and assessment work, which are both challenging and starting from a low level of development at regional level. It presents a roadmap highlighting where the largest gaps exist and makes recommendations on how to fill these gaps. Assuming that the necessary resources and approval are available to implement this plan, the potential final results could be as follows:

- The application of common indicators to more (sub) regions, as appropriate;
- The possibility for promotion of a number of candidate indicators to common indicator status so that they can be included in the next assessment cycle;
- Improvements in data availability, flow and management;
- Improved confidence in assessment results;
- An improvement in implementing an ecosystem approach through more holistic assessments and indicator integration;
- A basis to analyse pressure-state relationships in assessments;
- A basis for developing proposals for determining GES for pelagic, benthic and food webs are determined (reference conditions and threshold);
- Better scientifically credible management decisions;
- Improved proposals for the design of coordinated monitoring programmes.

For the OSPAR Contracting Parties this would mean that:

- OSPAR Contracting Parties who are member states of the EU are supported in their obligations to the EU MSFD;
- OSPAR has better knowledge of the state of the marine environment and is able to make more informed management decisions that enhance marine ecosystem services and protect and

conserve marine biodiversity:

- ⇒ OSPAR can progress implementation of the North East Atlantic Environment Strategy and the next QSR assessment cycle;
- ⇒ OSPAR regional plan to improve adequacy and coherence of EU MSFD implementation 2014-2018
- ⇒ OSPAR's Joint Assessment & Monitoring Programme (JAMP) with respect to JAMP Product B-10;
- ⇒ OSPAR's Coordinated Environmental Monitoring and Assessment Programme (CEMP).

## 4. Response

### 4.1. The EcApRHA project

The EcApRHA project (Applying an Ecosystem Approach to (sub) Regional Habitat Assessment) addressed gaps in the development of biodiversity indicators for the OSPAR Regions. In particular, the project was aimed at overcoming challenges in the development of indicators<sup>1</sup> relating to the EU MSFD (Marine Strategy Framework Directive 56/2008/EU), Descriptor D1 (Biodiversity), D4 (Food webs) and D6 (Seafloor integrity), and delivering an action plan to OSPAR that will enable monitoring and assessment at the (sub) regional scale, as well as to contribute to OSPAR Intermediate Assessment 2017.

EcApRHA was co-financed by the EU DG Environment and was implemented through collaboration of nine partners under the coordination of the OSPAR Secretariat. The partners were: Bioconsult, Biologie des Organismes et Ecosystèmes Aquatiques – Centre national de la recherche scientifique (BOREA-CNRS), the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Instituto Español de Oceanografía (IEO), Joint Nature Conservation Committee (JNCC), Muséum national d'histoire naturelle (MNHN), Royal Netherlands Institute for Sea Research (NIOZ), and the Sir Alister Hardy Foundation for Ocean Science (SAHFOS).

The project has successfully achieved its objectives. Through EcApRHA, six common and one candidate indicators (benthic, pelagic and food web) were technically improved and assessments of these indicators submitted as a contribution to the Intermediate Assessment 2017, which will support EU member states in their reporting on the EU MSFD. In addition, development of five candidate indicators have been boosted through the project, with improved technical specifications and road maps for further development, which will be delivered to OSPAR. Furthermore, the project has explored the needs, possibilities and options for indicator integration, which would be required in order to achieve ecosystem assessments and understanding of systems and functions. The project delivered technical analysis and potential proposals for further development of five integration approaches that could be applied in the OSPAR maritime area and beyond.

The development of an Action Plan was a funding requirement and is one of the main deliverables of this project. It recommends the steps to be taken by Contracting Parties in order to address the identified gaps and shortcomings in order to achieve more of an ecosystem approach (solutions and actions) and improve (sub) regionally coherent habitat assessment, monitoring and GES determination. It has been drafted in consultation with OSPAR technical expert groups as well as policy representatives.

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<sup>1</sup> The OSPAR common indicators that were improved by this project include: PH1 (Changes of plankton functional types (life form) index Ratio), PH2 (Plankton biomass and/or abundance), PH3 (Changes in biodiversity index), BH1 (Typical species composition), BH2 (Multi-metric indices), BH3 (Physical damage habitats), BH4 (Area of habitat loss), FW2 (Production of phytoplankton), FW4 (Changes in average trophic level) applied to benthic-demersal data, FW6 (Zooplankton community size structure in relation to biomass/abundance), FW7 (biomass and abundance of functional groups) applied to benthic and pelagic data, FW9 (Ecological Network Analysis)

## 4.2. Action Plan Goals

Action Plan Goals:

- To improve regionally coherent assessments through providing guidance on further improvements of:
  - ⇒ OSPAR common indicators (benthic, pelagic and food web) and their practical applicability within OSPAR
  - ⇒ OSPAR candidate indicators (benthic, pelagic and food web) which show potentiality to be beneficial and relevant for future OSPAR (sub) assessments and management
  - ⇒ Further analysis and testing of potential indicator integration applications in order to enable more holistic assessments within OSPAR
- To improve regionally coherent monitoring, including identifying opportunities where gaps could be filled through coordinated monitoring efforts;
- To improve documentation and improvement of regional data use, data flow and data management;
- To contribute to GES determination in OSPAR (sub) regions;
- To further support OSPAR Contracting Parties in their EU MSFD application and reporting

## 4.3. Regional application

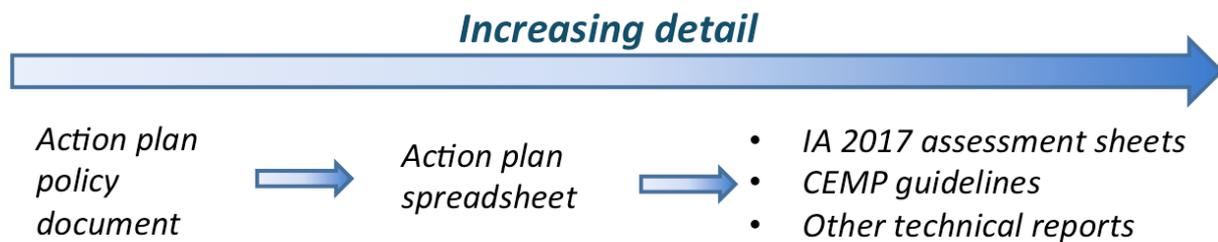
The Action Plan focuses mainly on Regions II, III and IV within the OSPAR maritime area but is also proposes expansion of to regions I and V. Additionally, the methods and techniques that have been progressed within the EcApRHA project and this Action Plan could be applied under the other Regional Sea Conventions.

## 4.4. Supporting documents

The Action Plan presented in Table 2 of this document is a simplified version, which has been produced to give a high level overview and support policy discussion. The full and detailed technical version of the Action Plan, which is designed to be used by technical experts. The Action Plan (technical) is presented as an Annex 1 and provided as an excel spreadsheet to facilitate use of the filtering tools. Furthermore, there is a third level of detail (Annex 2), which provides even deeper technical support and justification of analysis and work performed in the composition of the Action Plan (please see Figure 1). These are technical deliverables, such as assessments, guidelines and technical reports, which have been produced throughout the project. Links are made to these support documents in the Master Table. The documents are as follows:

- Draft assessments to the Intermediate Assessment 2017 (Annex 2) (please note that the finalised versions will be publically available on the launch of the IA 2017);
- Draft CEMP guidelines (Annex 2) (Please note that these documents will be available as technical documents within OSPAR only at this stage. They will be published on the OSPAR website as OSPAR Agreements, once they have been agreed by the Biodiversity Committee, in line with the OSPAR Rules of Procedure);
- Other technical reports (Annex 2) (please note that these have been made publically available as outputs of the EcApRHA project and can be accessed on [www.ospar.org](http://www.ospar.org)).

Figure 1: OSPAR Action Plan structure and supporting documents



## SECTION II:

Table 2 presented in this section has identified gaps that need to be addressed in further development of pelagic, benthic and food web indicators, in order to make these indicators operational and applicable in the North East Atlantic. Furthermore, it sets out recommended actions, describes what the potential consequences are if no actions are taken, illustrates the potential scale of resources required to implement the actions as well as the timescale for implementation.

This Action Plan is presented as an outcome of the EcApRHA project. However, it has been designed so that it can be used by OSPAR as an evolving and flexible document to support the work of OSPAR related to biodiversity assessment and monitoring for habitats and food webs. It is recommended that its implementation should be kept under regular review.

## 5. Actions

The following themes (Table 1) have been defined which are relevant to specific gaps and actions outlined in Table 2. These key themes highlight areas for improvement that need to be addressed to realise assessment of GES of benthic and pelagic habitats and food web related indicators or the ability to undertake an ecosystem-based approach to assess the marine environment. These themes are organised according to the ability to undertake indicator and ecosystem-based assessment.

**Table 1: The Action Plan overarching themes**

No	Theme	Significance
1	Retention of expertise	Short-term contracts of experts within the institutions represented in OSPAR are one of the main barriers to the assurance of continuous development of coherent regional assessments, monitoring and GES.
2	Methodology and monitoring	To undertake a robust and confident assessment of indicators, detailed methods are required. At present gaps in methods exist for certain indicators. Also, to be able to undertake assessment of indicators, cross-border, cost-effective monitoring methods need to be implemented.
3	Data	To be able to undertake assessment of indicators or an ecosystem-based approach, access to adequate data sources is essential. Currently, there are many areas where access to existing indicator or pressure data inhibits assessment.
4	Reference conditions	Understanding the reference condition is essential for all indicators in order to be able to detect changes in state, which will inform management measures.
5	Thresholds	To fulfil EU MSFD obligations for 2024, thresholds are required to be identified. To identify thresholds, knowledge of pressure-state relationships is required.
6	Assessment	A robust analysis and testing of the relevant indicators and ecosystem based approaches are essential to undertake detection of change of state and determine GES (e.g. towards GES).
7	Integration	To undertake an ecosystem-based assessment integration is essential. Integration will also enable a more holistic and robust assessment of the marine environment.

Key	
★	Can be progressed with existing resources (i.e. within the existing OSPAR Committee, ICG and expert group structure – assuming the existing allocation of experts continues)
★★	Additional resources needed in order to meet timelines (e.g. more expert time than is already committed, workshops etc.)

**Table 2: Actions recommended as a result of the EcApRHA project. Note that the project has not pre-empted decision on whether a Contracting Party may wish to take the lead on a particular action**

Action No <sup>2</sup>	Source	Gap	Recommended Actions	Potential consequences if no actions are taken	Scale of resources	Timing	Lead Party/ Parties
<i>Theme: Retention of expertise</i>							
8	All PH, BH and FW	Confidence in staff and research experience to be available for the continuation of the work	Development of ToR or work plan for the COBAM expert groups, linked to the overall COBAM ToR which will specify which particular aspects are going to be developed by the groups and help inform Contracting Parties in the need for allocating staff resources with relevant expertise.	At present there is a dependency on a small number of individuals and resources to deliver the work. This might cause delays in improvement of regionally coherent assessment, monitoring and GES. Lack of resource might lead to delays in meeting OSPAR and EU MSFD deadlines.	★	2017	
<i>Theme: Methodology and Monitoring</i>							
1	PH1/FW 5	Missing knowledge on species trait assignment and lifeform refinement	Additional scientific research is required to determine traits for many plankton species, and assess ecological relevance for some low confidence lifeforms or lifeform pairs e.g. HAB	Reduced accuracy of information on which to base management decisions	★★	2017-2019	

<sup>2</sup> Note that the action Number matches the numbers in the Action Plan (technical).

3	PH1/FW5 PH2 PH3	Missing plankton data using differing methodologies (e.g. very small organisms, macro-mega plankton, etc..)	Plankton data using semi-automated methods/complementary methods to microscopy should be acquired and included in the assessments	Assessment would be biased and inaccurate without these important components of the plankton community	★★	2017-2020	
9	BH1 BH2 BH3 BH4	Lack of an agreed OSPAR/ EU scale monitoring method and program	Develop and implement a coordinated joint monitoring program at the regional scale that individuals Contracting Parties can follow to facilitate cross-border comparison.	Uncoordinated monitoring programs will make it difficult to assess GES at a regional and sub-regional scale and cross-comparison will not be possible	★	2017-2019	
24	FW7	There is no consensus regarding common functional groups to be used in monitoring	Reach a consensus regarding the main Functional Groups to be considered when conducting analyses.	Lack of consistency of assessments, contracting parties are likely not to use all Functional Groups if no specific guidelines are provided	★	2017-2018	
25	FW9	Lack of knowledge of how Ecological network analysis (ENA) indices respond to all pressure sources	Analyse pressure sources separately for a better understanding of their impacts on ENA indices	Inability to interpret evolution of ENA indices under cumulative pressures	★★	2018-2019	
26, 17	FW9, FW4	Lack of accurate diet information to enhance local models and Trophic level (TL) data not accurate or missing	Stomach content and/or stable isotope analyses should be implemented in as many regions as possible.	The accuracy of the models will remain low if no action is taken.  The degree of uncertainty in some regions will remain high if no action is taken.	★★	2018, 2023, 2028	
29	Integrati on PH2/FW (FW6 and FW2)	Missing links between food web and pelagic indicators	Develop and test the FW6/PH2 approach on a case study and using the CPR data.  For the phytoplankton part, investigate the link between PH2 and FW2 in order to develop a more accurate production	1. Reduce accuracy of confidence and accuracy of assessment 2. The lack of plankton biomass estimations would introduce a significant bias in the holistic food-web assessment	★★	2017-2019	

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			indicator (P/B ratio) considering phytoplankton biomass for the food-web integration.				
31	Integration of BH3/FW 4	BH3 and MTL/fisheries pressure data is currently only available at different levels of definition	Modelling of the sensitivity of the habitats/areas in the same way as FW4, to provide a prediction of the potential habitat loss as a function of fishing pressure be obtained.	Interpretation of results may give an erroneous idea of the status of the relationship	★★	2017	
32	Integration of BH3/FW 4	BH3 has different spatial scales incorporated in its development, which are not considered in FW4	Current analysis is hampered by the indicators using different spatial scales. To progress the work on integration a further alignment of spatial scales across indicators is needed	Integration will give erroneous results	★★	2017	
<b>Theme: Data</b>							
2	PH1/FW 5 PH2 PH3	Missing plankton datasets from additional regions and member states	Develop a centralised database and dataflow for all plankton datasets	Assessments may be biased towards some regions, and missing important information	★★	2017-2019	
7	All PH, BH and FW	Lack of/restricted access to pressure data (e.g. fishing pressure, sewage, pollution)	Analyse the availability of data and check accessibility with groups that hold the relevant pressure data.	Scientifically sound assessments of benthic and pelagic habitats and food webs will not be possible (Low confidence on assessment results and limited understanding of the amount of change in condition driven by anthropogenic drivers versus prevailing conditions)	★	2017	
10	BH1 BH2	Lack of and restricted access to benthic and pressure data and	Develop sound accessible web portals to access pressure and benthic data including relevant metadata need to be	1. Wasted resource (time and money) in collecting new data when it exists	★★	2017-2020	

	BH3 BH4	metadata required for analysis	developed. Development of web portal should take into account existing initiatives (including OSPAR Data and Information Management System)	or if sufficient meta data hasn't been captured 2. Scientifically sound assessments of benthic habitats will not be possible 3. Uncoordinated assessment may arise.			
11	BH1 BH2 BH3 BH4	Limited availability of spatial data on benthic species and communities to undertake accurate predictive mapping and assess the state of the habitat. Lack of an agreed classification at the OSPAR level	An agreement on a (simple) definition of key communities at OSPAR level is required. In addition to ensuring existing habitat data that has been collected is accessible and new data is collected where data gaps are found. The definition should take into account existing national and international classification systems (e.g. EUNIS)	Difficult to assess the status (condition) and extent of habitat at finer and larger scales (e.g. sub-regional scales)	★★	2017-2023	
14	FW2	Lack of a complete identification of data availability and coverage in OSPAR regions	Initiate an OSPAR data call to identify current data coverage. Then, propose monitoring recommendations towards full data coverage	Assessment of the indicator in OSPAR regions will stay limited. Currently FW2 is contributing to IA2017 with case studies	★	2017-2018	
18	FW4	Insufficient representation of non-commercial fish and invertebrate species in the indicator assessments	Obtain biomass and abundance data for as many compartments of food webs as possible	A biased and skewed view of the GES of ecosystems is likely to be obtained	★★	2017-2018, 2023	
21	FW6	Lack of accurate zooplankton data availability and	Use existing case studies and data series in OSPAR regions to show the potential of the indicator. Propose recommendations	Not having an accurate estimation of the indicator which would give a biased	★★	2017-2018	

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		coverage in all OSPAR regions	towards a full coverage and accurate sampling.	assessment of zooplankton status evolution			
23	FW7	Missing functional groups in the indicator analyses / assessments	Update functional group list including invertebrates	Skewed vision of functional changes and responses in ecosystems	★★	2017-2019	
30	Integration of BH3/FW4	Regular access to regional spatial data products for fisheries pressure/ impact (produced on the basis of the ICES regional VMS/Log Book data call)	Establish the request for production of fisheries pressure/ impact data layers from OSPAR to ICES as a regular activity. Identify opportunities for sharing costs with other regional organisations that may share this need	Global trends at sub-regional level might be masking trends in highly impacted areas	★	2017	
<b>Theme: Reference conditions</b>							
6	PH1/FW5 PH2 PH3	Missing environmental definition of reference period	Develop protocol to define reference condition based on the environment	Indicators not linked to GES definition	★★	2020-2023	
12	BH1 BH2 BH3	Missing information to understand (pristine) reference condition at the regional scale	The creation of reference / no-take areas, where anthropogenic activities are inhibited and dedicated monitoring along a gradient of pressure is undertaken to assess pressure-state relationships	Low confidence in assessment results and limited understanding of the amount of change in condition driven by anthropogenic drivers versus prevailing conditions	★★	2017-2030	
16	FW2	Absence of local reference conditions	To analyse and identify local and/ or global drivers influencing the phytoplankton production. This work will allow constructing appropriate local reference values	Absence of local appropriate reference values reduces confidence and accuracy of assessment	★★	2020-2023	

20	FW4	Insufficient knowledge for reference values or thresholds to set GES	More case studies need to be analysed to examine variations of the indicator under different pressure levels	Threshold definition and GES assessment compromised. Also, it compromises the use of certain aggregation tools such as Nested Environmental status Assessment Tool (NEAT), which rely on threshold and reference values	★★	2017-2018	
22	FW6	Absence of local reference conditions and values	Setting GES boundaries for this indicator should be in relation to reference conditions of the zooplanktivorous fish (bottom up regulation) and to phytoplankton biomass (top down regulation). See example in HELCOM zooplankton indicator	Indicator not operational	★★	2019-2020	
27	NEAT "Version 1.2"	Setting reference values and surrounding boundaries for indicators to be included in NEAT	Additional resources would be required for experts to continue work jointly on defining the best way to set sub-regional threshold values of their indicators. The work was initiated in EcApRHA project with various approaches and this needs to be supported to progress further	Without reference values having been defined, the assessment cannot be run in the current version of NEAT	★★	2017-2022	
28	Pelagic integration	Missing reference period - investigation is required to determine a period to be used as a reference condition for all of the indicators	Develop protocol to define reference condition based on the environment and /or pressures	GES assessment is not possible	★★	2017-2018	
<b>Theme: Thresholds</b>							
5	PH1/FW5	Not enough knowledge of pressure-state relationships to	Agree on a standardised method to quantify pressure-state relationships and	1. No understanding of how much pressure an ecosystem component /	★★	2017-2018	

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	PH2 PH3	understand threshold conditions	apply the method to different habitat types/ ecosystem components.	habitat can withstand before changing condition or is lost 2. It will not be possible to understand what GES means for that particular habitat/ecosystem component. 3. Quantitative management measures will be difficult to implement			
13	BH1 BH2 BH3 BH4	Not enough knowledge of pressure-state relationships to understand threshold conditions	Standardised methods need to be agreed upon to undertake pressure-state relationships and apply the method to different habitat types	There will be no understanding of how much pressure a habitat can withstand before changing condition. It will not be possible to understand what GES means for that particular habitat. Quantitative management measures will be difficult to implement	★★	2017-2022	
<i>Theme: Assessments</i>							
4 15	PH1/FW 5 PH2 PH3 + FW2	Lack of complete regional model (eg. Ecohydrodynamic areas) to make spatial assessments	Extending the ecohydrodynamic areas to all OSPAR regions by modelling	1. Mismatches between indicators resulting in gaps in assessments 2. Unable to conduct a full spatial assessment of the indicators in all OSPAR regions 3. Problems for the coordinated monitoring at the regional scale	★★	2017-2019	
<i>Theme: Integration</i>							
19	FW4	Insufficient exploration of Integration/aggregation possibilities	To further analyse, identify and test additional integration approaches to improve holistic analysis of habitat and food web indicators	Limited holistic analyses and assessments	★★	2017-2018	
33	Benthic habitat	The method for benthic habitat	Test benthic habitat indicator integration	1. A quantitative ecosystem approach to integrating benthic and indicators	★★	2017-2018	

	integrati on	integration needs to be fully tested using existing data		dependent on benthos will not be possible. 2. The confidence in the habitat models and habitat sensitivity assessments will not improve.			
34	Benthic habitat integrati on	Integrate other non-benthic habitat indicators into the system and test the process	The methods need to be tested and incorporate other indicators as relevant and possible.	Impossibility to have a quantitative ecosystem approach without the benthic integration	★★	2017-2019	
35	Bow-tie approach	Biodiversity input to the on going development of the bow-tie approach in understanding the components, linkages, management and wider utility within OSPAR	This work stream is being progressed by ICG-C, however, successful delivery will require dialogue / collaboration with relevant indicator leads within different OSPAR committees. The recommendation is for expert support to be provided from BDC/ICG-COBAM within the contact of ICG-C. Also to draw on relevant projects within Contracting Parties where these exist (e.g. a current project within the UK)	The biodiversity element is critical to the cause/ effect relationship expressed in the approach.	★	2017	
36	Integrati on (all PH, BH and FW)	No holistic assessment of indicators exists across the descriptors	The different methods developed (refer to D4.1) need to be tested on the same set of indicators, within the same area to undertake cross-comparison of results and analyse which would be the best method to forward integration of EcApRHA related (or wider Descriptor) indicators	1. No ecosystem-based approach undertaken and effects from co-occurring pressures on ecosystem components may not be evaluated. 2. Deterioration on one ecosystem component may have a direct or indirect effect on another ecosystem component (e.g. effects of deterioration of benthic habitats may have a negative effect on food web and commercially important	★★	2017-2023	

Action Plan

				fish species), which will not be quantified if an ecosystem assessment is not undertaken			
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## SECTION III:

### 6. Governance

#### 6.1. Who coordinates the implementation of the Action Plan

This Action Plan is a deliverable of the EcApRHA project. Following the completion of this project, the Action Plan was presented to OSPAR via the Biodiversity Committee. It is proposed that the implementation of this plan would be well placed within ICG-COBAM who initiated the project and deliver biodiversity assessment and monitoring, under the steer and guidance of BDC.

#### 6.2. Who supports/is involved in the implementation of the Action Plan

Successful implementation of this Action Plan and its goals requires commitment to the development of an ecosystem approach. An ecosystem approach focused on the marine environment requires information and knowledge about state, pressures and the consequences of the negative or positive impacts.

In order to make pelagic habitat, benthic habitat and food web indicators operational and scientifically sound, there is a need to progress the understanding of the links between its state and anthropogenic pressures. It is impossible to understand what GES means for the particular habitat if there is no knowledge on how much pressure a habitat or species can withstand before changing its condition. This is also crucial in order to guide and implement appropriate quantitative management measures. To be able to do that, implementing this plan will require coordination between OSPAR Subsidiary bodies, e.g. those working on development of pressure layers.

#### 6.3. Cooperation with other organisations

The Action Plan should be implemented in close cooperation with other relevant national, regional and global organisations and initiatives.

Cooperation with other Regional Seas Conventions (RSCs) should be further developed to exchange relevant information and knowledge, in particular in the areas bordering different Regional Sea Conventions. Also countries that are Contracting Parties to more than one RSC are likely to need to coordinate cooperation the work in each RSC's to assure better exchange of knowledge, relevant issues and information, as well as to avoid any duplications or conflicting requirements or practices.

#### 6.4. Resource requirements for the implementation of the Action Plan

Some of the identified actions do not require additional resources and can be implemented through the regular day-to-day business of existing OSPAR subsidiary bodies such as ICG-COBAM. However full implementation of this Action Plan will require additional technical and financial support. This is mostly human resource and means to bring people together, for workshops, developing tools for data management etc.

If additional resources cannot be identified to implement the Action Plan then the tasks identified would take longer and achieving regionally coherent assessments, monitoring and GES may remain a challenge even for the third EU MSFD cycle.

There may need to be creative solutions to identifying suitable resources, including making use of any further EU funding opportunities, making use of opportunities to cooperate with other regions.

## **7. Monitoring and reporting**

It is proposed that the implementation of the action plan should be evaluated on a regular basis within the strategic planning for OSPARs work of biodiversity monitoring and assessment and the progress be kept under review by the Biodiversity Committee.

## **SECTION IV:**

This section provides further links and direction for more detailed information to support this Action Plan. As mentioned in Figure 1, this Action Plan is a simplified version, which has been specially prepared for policy-focused communications. The master table (Annex 1) is the technical version of the Action Plan, has been designed for the use of technical experts. In addition to that and in support of both, the Action Plan policy document and master table, there is a third level of details, which provides, even deeper technical backing regarding the identified gaps and required action within the Plan. These documents can be found in the Annex 2 of this Action Plan.

**Annexes:**

**Annex 1: Action Plan (technical) (see attached Excel file)**

**Annex 2: List and link to the EcApRHA project technical deliverables**

Table below presents all the technical deliverables, which have been delivered through the EcApRHA project. Also, these documents serve as a detailed technical support to the Action plan (policy overview and detailed). All the deliverables within the table are at: <http://www.ospar.org/work-areas/bdc/ecaprha>

<b>EcApRHA Deliverable No.</b>	<b>Title</b>
<b><i>Draft input into the Intermediate Assessment 2017</i></b>	
1.1-1.3	PH1/FW5 – Changes of plankton functional types (life forms) index ratio
1.1-1.3	PH2 – Plankton biomass and/or abundance
1.1-1.3	PH3 – Changes in biodiversity index (s)
2.1-2.3	BH2 - Condition of Benthic habitats: Multi-metric indices
2.1-2.3	BH3 - Physical damage of predominant and special habitats
3.2	FW2 – Production of phytoplankton
3.1	FW4 – Changes in average trophic level of marine predators (cf MTI)
<b><i>Draft CEMP guidelines</i></b>	
2.2	BH1 - Typical species composition
2.2	BH2 - Condition of Benthic habitats: Multi-metric indices
2.2	BH3 - Physical damage of predominant and special habitats
2.2	BH4 - Area of habitat loss
3.4.1	FW6 - Zooplankton community size structure in relation to biomass/abundance
3.3	FW7 - Biomass and Abundance of Functional groups
3.4.2	FW9 - Ecological Network Analysis indicator
<b><i>Other technical reports</i></b>	
1.1	Plankton programming outputs for constructing the plankton lifeform indicator from disparate data types
1.2	Combining methods and data for a more holistic assessment of the plankton community
1.3	Spatial Representativity of Plankton Indicators

1.4	Cross-linking plankton indicators to better define GES of pelagic habitats
2.3	Applying a risk-based approach towards an integrated assessment of benthic habitats at a regional sea scale
3.1	Implementation of the Mean Trophic Level indicator (MTL, FW4) and assessment of its use at a sub-regional level (OSPAR region IV)
3.2	Testing of a functional indicator on a sub regional scale addressing data and knowledge gaps: <i>Measuring phytoplankton primary production: review of existing methodologies and suggestions for a common approach</i>
3.5	Report on the integration of OSPAR food web indicators into the NEAT tool
4.1	Ecosystem focused scenarios for improved and coherent GES and optimized methods for assessment of habitats at (sub) regional level
5.6	Development of a coherent Action Plan for consideration of Contracting Parties

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