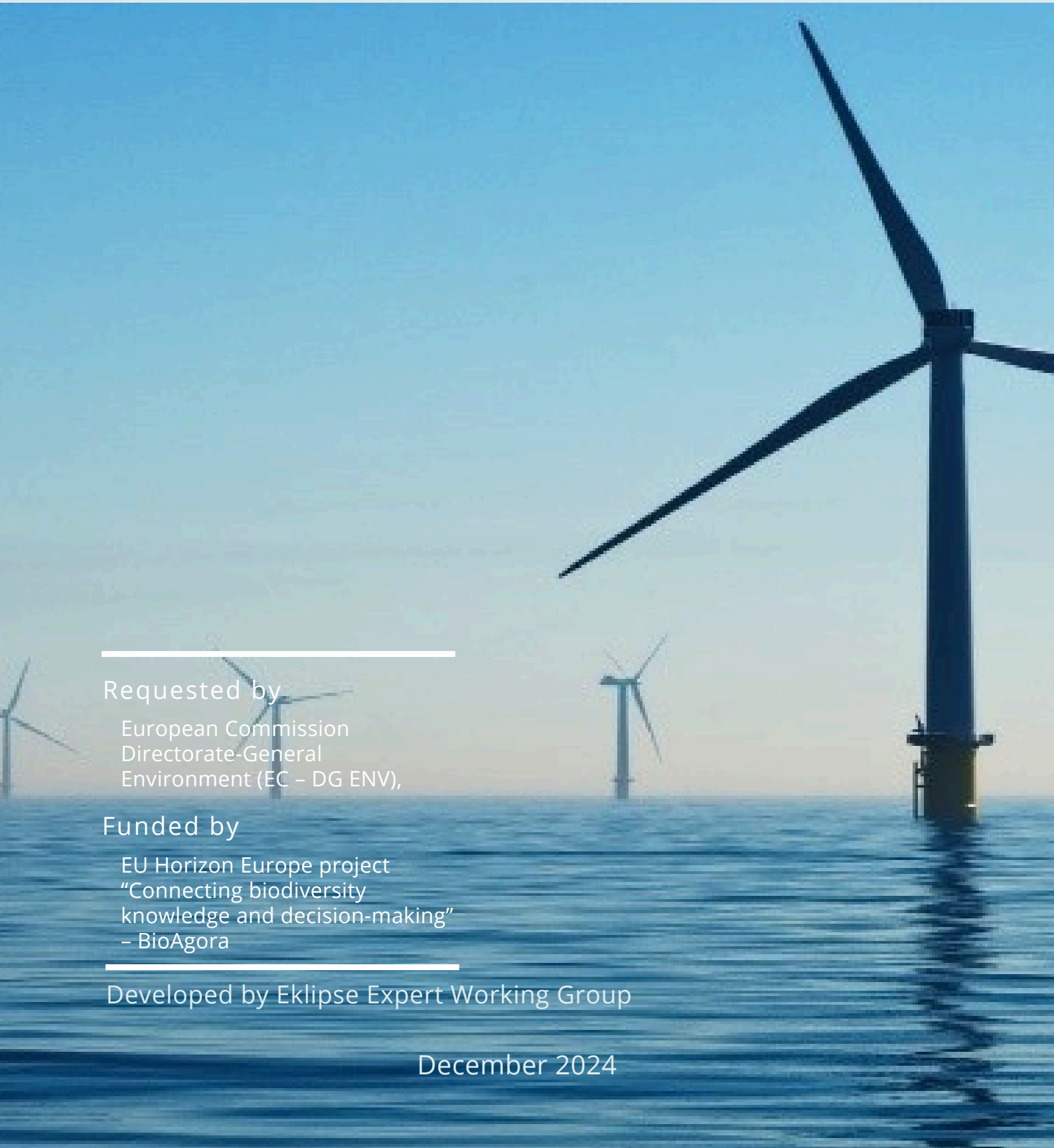
METHOD PROTOCOL

Impacts of offshore wind farm expansion: what are the consequences for achieving Good Environmental Status across European marine waters?



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"Connecting biodiversity
knowledge and decision-making"
– BioAgora

Developed by Eklipse Expert Working Group

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Methods protocol
December 2024

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1. BACKGROUND

The request aims to examine the multi-level impacts of the planned expansion of wind energy production at sea, including cumulative impacts on marine ecosystems and the achievement of good environmental status (GES). Such analysis is critically needed given the targets set by the European Union for renewable energy sources that need to be achieved by EU Member States in the coming years, and a large number of renewable energy projects are likely to be developed offshore. Existing studies on cohabitation between offshore wind energy production and nature tend to focus on marine protected areas (MPAs) or the protection of species (e.g. birds, fish and marine mammals). Existing knowledge should include an analysis relevant to all dimensions (descriptors) of GES according to the Marine Strategy Framework Directive (MSFD). Such analysis, which includes literature reviews and scenario modelling, should look at how offshore wind energy expansion could affect the achievement of GES, considering the GES threshold values set by EU Member States for several GES descriptors (such as seabed integrity, underwater noise, contaminant levels, species abundance, etc.) and the subsequent cumulative impacts.

Environmental impacts can stem from a range of activities in a given area or region, where each individual effect may not be significant if assessed in isolation. Cumulative impacts are defined as:

> *'The impacts (positive or negative, direct and indirect, long-term and short-term impacts) arising from a range of activities throughout an area or region, where each individual effect may not be significant if taken in isolation. Such impacts can arise from the growing volume of traffic, the combined effect of a number of agricultural measures leading to more intensive production and use of chemicals, etc. Cumulative impacts include a time dimension since they should calculate the impact on environmental resources resulting from changes brought about by past, present and reasonably foreseeable future actions.' (European Commission, 1999[1])*

The study will provide science-based insights to the EU Commission to propose solutions, including in the context of the Member States' MSFD Programmes of Measures and the MSFD review, to make sure that offshore wind energy expansion does not hinder the achievement of GES under the MSFD, considering the entire lifecycle of offshore wind power plants (including decommissioning). These solutions could relate to maritime spatial planning (e.g., current developments in the context of the Greater North Sea Initiative[2]), particularly

[1] European Commission. 1999. Integrating environment concerns into development and economic cooperation. Draft version 1.0. Brussels - cumulative impacts — European Environment Agency

[2] GNSBI aims to establish an intersectoral platform for the development of the North Sea region, fostering cooperation among the 9 bordering countries. https://maritime-spatial-planning.ec.europa.eu/media/document/15065

considering the cumulative impacts of other anthropogenic activities on the marine environment. Identification of alternative solutions (for instance, technological) would also be welcome.

2. OBJECTIVES

The main goal of the request put forward by the Directorate General for Environment (DG ENV) is to enhance the understanding of the potential impacts of Offshore Wind Farms (OWFs) expansion on achieving Good Environmental Status (GES), as defined by the Marine Strategy Framework Directive (MSFD).

Specifically, the work aims to:

a. Investigate the impacts of fixed-foundation wind turbines and grid connection infrastructure expansion on each of the 11 Descriptors of GES under the MSFD (Figure 1), as described in https://environment.ec.europa.eu/topics/marine-environment_en.
b. Assess the consequences of the cumulative impacts on marine ecosystems
c. Identify and analyse knowledge gaps and mitigation strategies through literature review, expert consultation and participatory workshop.

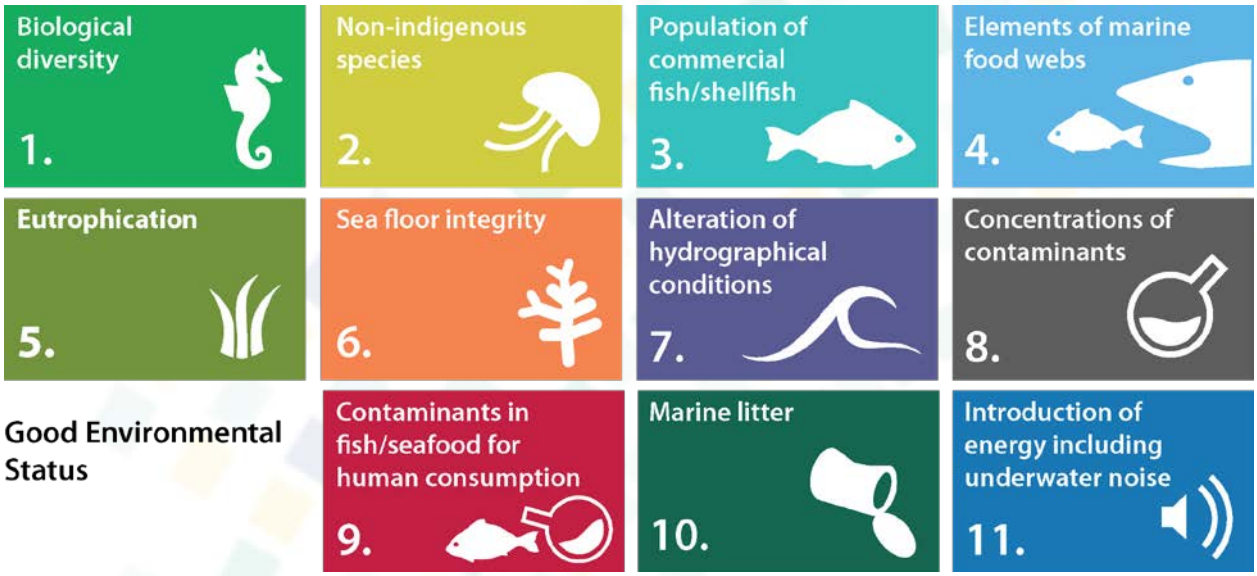

Figure 1. MSFD descriptors © OSPAR https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/introduction/policy-context/

2.1 POLICY RELEVANCE AND GEOGRAPHICAL SCOPE OF THE REQUEST

The final framing of the request seeks to contribute primarily to the MSFD (and its ongoing review). It will also inform other EU legal instruments/ policies such as the Maritime Spatial Planning Directive, Birds and Habitats Directives, Renewable Energy Directive, Biodiversity Strategy, Zero Pollution Action Plan, Marine Action Plan, Wind Power Action Plan, Nature Restoration Law, as well as regional and/or international agreements or processes, notably the Regional Sea Conventions Action Plans/ activities, and other possible initiatives planned/ taking place at a regional level through:

a. the negotiation or implementation of a legal act (Directive, Regulation, Decision),
b. the negotiation or implementation of a non-binding instrument (e.g., Strategies, Communications),
c. the drafting of EU action plans or legislative proposals (either at the development, negotiation, or adoption phase).

The geographical scope of the request is the European Union Marine regions and subregions as defined under the MSFD: the Baltic Sea, the Black Sea, the North East Atlantic (including the North Sea, the Celtic Seas, the Bay of Biscay and the Iberian Coast, and Macaronesia), and the Mediterranean Sea (including the Western Mediterranean Sea, the Adriatic Sea, the Ionian Sea, the Central Mediterranean Sea, and the Aegean-Levantine Sea).

2.2 RELEVANCE FOR BIODIVERSITY

Due to the targets set in EU and national legislation and policies, the planned developments of offshore wind production are likely to be at such a large scale that they will have impacts on marine ecosystems and their functioning. Impacts from offshore wind developments may include seabed habitat loss, disruption of migratory routes, physical injury or mortality, disruption within feeding and breeding grounds, introduction of underwater noise and electromagnetic fields, input of litter and contaminants as well as changes to hydrographic conditions. Almost all descriptors of GES are likely to be impacted by these developments.

3. METHODS

3.1 TIMELINE AND TYPE OF DELIVERABLES

The request's results will greatly contribute to the discussion on the Greater North Sea Basin initiative, which will begin in November 2024, and to the MSFD review, which is planned for 2025. Draft summaries will be finalised by March 2025.

The desired deliverable is a single report containing short scientific summaries for each GES descriptor, each containing:

- a qualitative analysis of the impacts, including the cumulative nature of impacts, of the planned expansion of offshore wind energy production on marine ecosystems, both pelagic and benthic. This will be based on a literature review.
- a gap analysis which identifies and analyses knowledge gaps and mitigation strategies through a literature review.

3.2 METHODOLOGICAL FRAMEWORK

This section provides a general description of the proposed methodology: a two-staged methods process. Stage 1) a Scoping Review (SR) to produce short science summaries (SSS) that will then be used to inform a broader public. In stage 2) an online expert consultation and participatory workshop will discuss knowledge gaps identified in the SSS.

STAGE 1: SCOPING REVIEW FOR SSS

The Scoping review (SR) will provide an overview of the distribution and extent of existing evidence relating to the above-mentioned objectives. It will help to identify knowledge gaps for which further information will be sought from the expert consultation and participatory workshop. The SR will be conducted in close accordance with the guidelines and standards for quick scoping reviews (Collins et al., 2015, Dicks et al., 2017). Thus, the SR will follow a structured methodology - following an a priori protocol (current document) - to collate and synthesise the existing research evidence into short scientific summaries per GES descriptor. Due to time constraints, a full systematic review will not be feasible to meet the proposed deadlines. Whilst less time intensive than a full systematic review, the SR can be applied to understand the impact of either a 'pressure' on a system or a policy-driven intervention and is designed to be transparent and to minimise bias (Collins et al., 2015).

Review question components

Key question components are defined to address the review question according to the PerSPEcTiF framework (Booth et al., 2019) (see Table 1 below).

Table 1. Key question components of the review question according to the PerSPEcTiF framework (Booth et al., 2019)

Perspective	Setting	Phenomenon of interest	Environment	Timing	Findings
Academic literature, scholarly reviews	European regional seas	Impacts of offshore wind farms on the achievement of Good	Marine environment	2008 - present	Permanent and short-lived impacts of offshore wind farms on marine ecosystems linked to the 11

		Environmental Status (GES)			descriptors of GES i.e., marine biodiversity, non-indigenous species, commercial fish and shellfish, food web, eutrophication, seabed integrity, hydrological conditions, contaminants, contaminants in seafood, marine litter and underwater noise; cumulative nature of impacts

Search strategy

A search for peer-reviewed scientific literature will be conducted in existing topical literature databases. Two academic databases will be consulted. Web of Science core collection, and Scopus.

The searches will be conducted in the indexed articles' titles, abstracts, and keywords (i.e. using the "Topic" field tag in WOSCC, and "TITLE-ABS-KEY" tag in Scopus). The search strings are listed in Annexe 1 and based on the criteria for the descriptors as stated in Article 8 of the European Commission Decision on GES 2017/848 document. Boolean operators (e.g., AND) will be used to connect keywords in search queries with OWFs to have more focused and productive results. After the search is completed, all references will be exported and archived into a bespoke Excel database. Duplicates will also be managed and archived before screening.

Eligibility criteria

Once the search has been completed, the studies will be filtered using the predefined set of inclusion/ exclusion criteria outlined below to collate a more relevant evidence base.

Table 2. The defined set of inclusion and exclusion criteria, following the PerSPEcTiF question framework in Table 1.

Criteria according to the PerSPEcTiF framework		Description
Inclusion criteria	*Eligible Perspective*	All peer-reviewed literature on single impacts and/or cumulative impacts of OWFs on the achievement of GES published only in the English language. Other languages are beyond the scope of these SSS.

	Eligible setting		Only literature based on the European regional seas as defined by the EU MSFD.
	Phenomenon of interest	*Eligible subject*	As defined by the EU MSFD, all species groups and habitats defined across 11 descriptors (D01-D11): D01: marine birds, marine mammals, marine reptiles, fish, and cephalopods native to EU waters (cf. annexe 1) will be retained. N.B., bats will be included as mounting academic literature is also revealing impacts on this flying vertebrate group. D02: non-indigenous species (NIS) (cf. annexe 1) introduced by OWF activities that impact native marine biodiversity and ecosystems. D03: populations of commercial fish and shellfish species impacted by OWFs. D04: ecosystems, including food webs impacted by OWFs. D05: algae blooms and oxygen deficiency in EU waters D06: physical loss (or permanent change) of all-natural seabed habitat types, resulting from the anthropogenic pressure of OWFs, including connection cables D07: hydrographical conditions (e.g. changes in wave action, currents, salinity, temperature) to the seabed and water column. D08: pollutants/ contaminants, i.e. 'synthetic compounds, non-synthetic substances and compounds liable to cause pollution'. This includes all substances (i.e. chemical elements and compounds) or groups of substances that are toxic, persistent and liable to bio-accumulate. D09: contaminants in edible tissues (muscle, liver, roe, flesh or other soft parts) of seafood (including fish, crustaceans, molluscs, echinoderms, seaweed and marine plants) caught or harvested in the wild. D10: any persistent, manufactured or processed solid material that is discarded, disposed of, or abandoned in the marine and coastal environment D11: any introduction of energy, including underwater noise, both continuous and impulsive sources, caused by OWFs as described in MSFD
		Eligible Exposure	All fixed-bottom offshore wind turbines across lifecycle stages: installation, operation, and decommissioning
	Eligible Findings		Relevant findings in line with the existing primary assessment criteria of the MSFD: Findings 1: Single direct impacts of OWFs on marine biodiversity and ecosystems.

			Findings 2: Cumulative impacts (e.g., combined, repetitive, and interactive impacts) that may result from OWF activities over time and space. *N.B.* not all qualifying documentation requires reporting both types of impacts simultaneously.
	Eligible Environment		Marine environment, including coastal zone to open ocean.
	Eligible Timing		All relevant evidence will be considered since the ratification of the MSFD (Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008), i.e. 2008 – to present.
	eligible language		English.
Exclusion criteria	*Ineligible setting*		All studies outside of the European Union's regional seas.
	Phenomenon of interest	*Ineligible subject*	All terrestrial wild species/domestic species will not be retained.
		Ineligible Exposure	Any renewable energy other than OWFs. i.e. all onshore wind farms, and all photovoltaic parks. Also, floating wind parks are not included in this current study.
	Ineligible environment		All evidence focused on terrestrial species and habitats.
	Ineligible Timing		All evidence published before 2008 will not be considered for Scoping review purposes.
	Ineligible language		All, except English.
	Ineligible findings		Any mention of results other than single direct impacts or cumulative impacts of OWFs on descriptors' subjects.

Screening strategy

Following the predefined eligibility criteria stated above, the study selection will follow a two-phased screening process. In the first phase, all titles and abstracts will be screened. In the second phase, a full-text screening will be undertaken. Hence, if the qualifying information is not detailed sufficiently to reject or to retain a title/abstract with certainty in the first phase, then the publication in question will be retained for assessment at the next eligibility step (i.e. full-text screening).

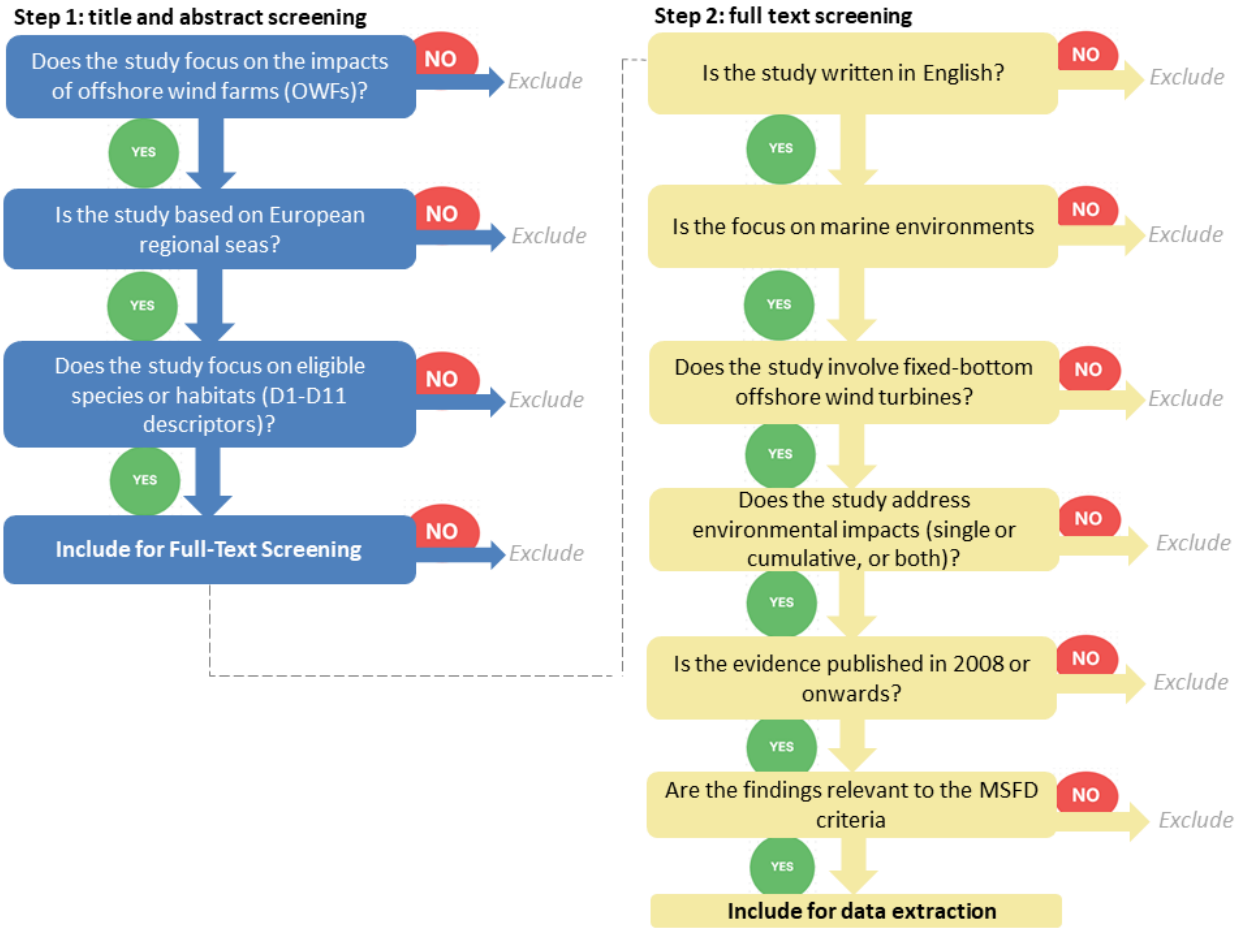

Figure 2. Decision trees illustrating the screening process

Data collection and analysis

Data/ information will be extracted into online Google Sheets from the retained scientific literature which will be used for the synthesis of SSSs. A Google sheet will be created for each of the GES descriptors. To ensure data/ information is extracted in a repeatable, objective, and structured manner, the following attribute data/ information listed below will be extracted, following the PerSPEcTiF framework:

Perspective characteristics:

- Publication source
- Type of publication (e.g. journal article, book chapter, conference proceeding)
- Publication details (i.e. title, authors, publication year, DOI)
- Time frame: data collection period, i.e. when were data collected (different from publication year)

Setting characteristics:

- Geographical location, according to the MSFD regional and sub-regional seas (e.g. Baltic Sea, Black Sea, Mediterranean Sea and North East Atlantic - North Sea, Bay of Biscay, Celtic Sea, Iberian Coast).
- Ecosystem type, related to major biological zones (depth) and substrate type, according to the EUNIS level 2 Classification: A1—Intertidal rock and other hard substrates; A2—Intertidal sediment; A3—Subtidal rock and other hard substrates; A4—Circalittoral rock and other hard substrates; A5—Subtidal sediment; A6—Deep-sea habitats; A7—Pelagic habitats; A8—Ice-associated marine habitats + free space for others ecosystem types.
- Specific ecosystem, based on Campagne et al. 2023: Tidal marsh, Seagrass; Reef habitats, Kelp forests; Estuary + free space for other specific ecosystem types.

Phenomenon of interest characteristics:

- Subject of interest:
    - Species groups, habitats impacted.
        - whether: pelagic, benthic, and other
        - if migratory species: yes, no.
        - seasonal habitat due to migration from feeding, mating and/ or nursery ground

- Exposure characteristics:
    - Type of wind farm turbines causing impacts (following Rezaei et al. 2023 typology):
        - Fixed-bottom offshore wind turbines: (i) Monopile; (ii) Tripod; (iii) Jacket; (iv) Suction caisson; (v) Gravity base; (vi) Tripile; (vii) Twisted jacket.

Findings' characteristics:

- Characterisation of the pressures-impacts relationship for each GES descriptor.
    - Relative to three different lifecycle stages: 1) installation, 2) operation, and 3) decommissioning.

- Evidence of impact measured or observed (i.e. relating to individual GES descriptors)
    - D01: Changes in studied biodiversity group with regards to wind farm expansion (e.g. Birds, Mammals, Fish, Cephalopods - Indigenous sp. only)
    - D02: Changed composition of native marine communities, displacement of native species due to the introduction of Non-indigenous species by wind farm expansion
    - D03: Studies covering commercial fish and/or shellfish impacted by OWF expansion.
    - D04: Food webs (e.g. describe impacts on linkages between living organisms caused by wind farm expansion)

- D05: Eutrophication (e.g. describe impacts on chlorophyll a, phytoplankton biomass, primary production, dissolved oxygen and nutrient dynamics)
- D06: Seabed integrity (e.g. describe impacts such as physical disturbance and loss of habitat due to wind farm expansion, including from connection cables)
- D07: Hydrological conditions (e.g. describe impacts to physical parameters of seawater: temperature, salinity, depth, currents, waves, and turbidity due to wind farm expansion)
- D08: Contaminants (e.g. describe impacts of contaminants associated with wind farm expansion that degrade the marine environment)
- D09: Contaminants in seafood (e.g. describe impacts of contaminants in seafood caused by the expansion of wind farms)
- D10: Marine litter (e.g. describe impacts related to litter such as mortality entanglement)
- D11: Underwater noise (e.g. describe impacts associated with electricity systems, noise, electromagnetic radiations, vibrations, among others related to wind farm expansion)

Additional characteristics;

- The aim of the SSS is to describe findings on cumulative impacts rather than to measure them. This will include systems thinking (Arnold and Wade, 2015) whenever it is possible.
- Study type: 1) Observational, 2) Experimental
- Study design: Control-Impact (CI) (reference site or site comparison), Before-After (BA) (temporal comparison), After only (multiple points in time), Before-After-Control-Impact (BACI), gradient sampling design, or No comparator.

Lastly, if some information is unknown because it is not provided, we will code it as “Unknown”.

Experts will be divided into specific groups working collaboratively to screen and develop the analysis while closely monitoring the overall process. The Expert Working Group (EWG) and the Methods Expert Group (MEG) will discuss any uncertainties during the data extraction, and joint decisions will be made.

Scoping review mapping and presentation

A scoping database will be compiled, including all relevant metadata from the retained documentation from the full-text screening stage. For cases where more than one type of impact (i.e. finding) is reported (measured or observed) in the same document, a unique entry in the Excel database will be made. This will require specific data entry IDs (e.g. name_et_al_2008_1, name_et_al_2008_2).

This database will be described in the final report using summary figures and tables of the relevant characteristics (listed above). A geographic map may be used to present the distribution of impacts identified from the literature. Knowledge gaps (under-represented subtopics that warrant further primary research) and knowledge clusters (well-represented subtopics) will be identified by cross-tabulating metadata (e.g. subject characteristics, exposure characteristics, findings' characteristics etc.).

STAGE 2: PARTICIPATORY WORKSHOP USING EXTERNAL EXPERTS

A three-hour participatory workshop will be held to support this project, extending the outcomes of the draft report. The main purpose of this workshop is to capture experts' knowledge and insight to corroborate and expand the outputs of the literature review, providing experiential evidence, including managing cumulative impacts. This will also help to validate and complement knowledge gaps from the scoping review and develop possible actions for each of the 11 descriptors around main phenomena of interest (i.e. cumulative impacts, physical impacts, chemical impacts, impacts on habitats and biodiversity as well as ecological interactions etc.), and considering potential mitigation strategies.

The workshop will utilise online breakout group sessions; each session will have a facilitator and administrative support provided by the MEG/ KCB (Knowledge Coordination Body). This managed approach will enable focused discussions on each descriptor in dedicated sessions. There will also be a final session that brings all groups together to identify common themes, challenges and opportunities. To maximise the outputs and experience in the workshop, a briefing paper will be sent in advance with the draft scoping report. Post-workshop, a summary of notes from the discussions will be sent out for further participant reflection and additional insights.

Timeline

The workshop will take place in February 2025 once the draft report is available by the end of January 2025.

Recruitment

The identification of experts/ stakeholders will be based on the thematic expertise required (e.g. aligned with gap areas or specific descriptors used in the analysis), and their field of experience. Given that the number of descriptors exceeds five with varying gap areas, merging of sub-categories or prioritising key gap areas is proposed as an efficient approach to addressing the request.

Stakeholders from various sectors—including academia, consultancy, NGOs, industry, and policymaking —will be identified using the Eklipse network and Eklipse methods for expert consultation, along with selective recruitment from the 15 institutions identified initially as holding relevant expertise (Annexe 2). EWG members will actively contribute by suggesting external experts, particularly recurring leading authors from the reviewed literature. Additionally, experts will be identified through consultations with organisations involved in related but separately timed reports, such as ICES, the European Environmental Agency, and IFREMER. The EWG will review the initial expressions of interest (EOIs) to identify experts who are interested and suitable for participation in this project phase.

A shortlist of candidates will be compiled, and invitations will be sent by January 2025 to align with the scheduled workshop in February. The goal is to secure 30-40 potential representatives. To facilitate balanced participation, descriptors will be grouped into five clusters, with each cluster represented by six participants.

Workshop format and outcomes

The workshop will be conducted as a virtual webinar (Zoom), featuring contributions from the EWG, the requester, and workshop participants to shape the action plan. Before the workshop, participants will receive the draft report and a briefing paper to review. The workshop will feature key presentations based on the SSS and presented by the lead for the respective SSS. These are designed to guide and shape the subsequent interactive breakout sessions. A professional facilitator will help drive the workshop, while a chairperson from the MEG/ KCB or EWG will provide administrative support with the assistance from thematic facilitators and note-takers for each breakout group (thematic area). Following the breakout sessions, a cross-group exchange will be facilitated to allow participants to interact with the other group members. Miro board, a virtual workspace with a whiteboard (https://miro.com), will be used to capture the essence of the discussions.

The suggested format would thus include:

- A summary of the report and results
- Thematic area discussions to identify and discuss knowledge gaps and key results (breakout groups)
- Plenary to share results, discuss common challenges and opportunities and identify next steps

To minimise bias, participants will not be remunerated for their time, avoiding financial motivations for participation. They will, however, be provided with the option to be named in the final report as contributors. Further, consent will be obtained from the participants to record the workshop, facilitating notetaking and summarisation. With support from the Research Assistant (RA), MEG and the EWG will develop guidelines for seeking consent, incorporating consent forms and conflict-of-interest declarations as essential components of

the recruitment process. These forms will address confidentiality issues and outline key participation requirements, including minimum time commitments and a summary of the workshop objectives and structure.

The data generated from the workshop will be housed temporarily on Google Drive with secured sharing to the EWG and MEG members. In the long run, the data will be collated and safeguarded by Eklipse processes for data collection and storage. Further, a subgroup of the EWG will be tasked with the data analysis, and the RA will devote time to this activity with support from the MEG.

Analysis of results

The report will have a leading narrative supported by quotes to bring the workshop outcomes to life. In addition, we will also use the outputs captured during the virtual workshop (Miro board). These obtained summaries will help to draft the project report.

A summary of each thematic group discussion and the plenary will be prepared and circulated to the participants after the workshop for further comments and reflections. This enables any recording errors to be identified in accordance with good ethical practice. It offers space for further elicitation post-workshop, which can be a useful exercise. The final report incorporating input from the follow-up exercise (summary sharing) will also be circulated at the end of the request. Drescher and Edwards (2018) offer additional insights into enhancing transparency and reporting in expert consultations, particularly regarding the use of expert knowledge. These considerations have been incorporated into the methodology and ethical guidelines.

4. LIMITATIONS

There are a number of caveats of the proposed methodological approach, which are listed below:

- The literature search covers a broad scope but is constrained by language restrictions and a limited number of bibliographic databases.
- The call had a limited timeframe, which limited the scope, used databases and dimension of this review.
- Grey literature, as well as governmental documents, has not been included in the scoping review due to time and resource limitations. However, the participatory workshop can be considered a proxy to enable experts to comment on the scoping review results and address the objectives of the request.
- The databases used in the scoping review are limited to Scopus and Web of Science in line with the resources available. We are aware of other databases, and these will be signposted in our recommendations.

- We rely on MSFD descriptors as the core framework for structuring our scoping review. This imposes limitations on the scope set within the context of the directive. But it is a unique approach to understand impacts and cumulative impacts by offshore windfarm expansion.
- There will only be one participatory workshop for three hours, which limits the deliberative process and potentially constrains what can be achieved. Pre- and post-workshop tasks (i.e., sharing of the scoping review report and briefing paper before, and sharing of the workshop report after) can help overcome this.

5. ETHICAL CONSIDERATIONS FOR METHODS PROTOCOL

Eklipse process is built on a robust ethical infrastructure composed of twelve measures to mitigate potential ethical risks. In addition to protecting integrity and credibility, this ethical framework is crucial for the cooperation of actors from different spheres within a complex science-policy-society interface. In the context of activities undertaken by the EWG, the ethical framework applies and participants to the planned activities need to comply to the Eklipse Code of Ethics and tailored ethical measures need to be proactively set up before the activities start. Eklipse will be the body responsible for the overall administration and compliance of the ethical framework and tis procedures. Members of EMB, KCB and MEG will work collaboratively to ensure good practice is followed and the ethical procedures developed for the project are approved through the peer review process.

1. Provide details of participant population and the number of participants required (Include brief characteristics as well as principal inclusion and exclusion criteria)

The workshop will include five clusters (thematic areas) with up to six participants in each thematic area. Ideally, their expertise should cover all the identified gap areas and most of the 'combined' descriptors of GES used for the SSS and SR. Given the virtual nature of the workshop, experts from across the globe will be invited. Based on Eklipse's approach to mapping and gathering consent, individuals will be asked to sign a conflict-of-interest declaration, including their involvement in active projects that may be impacted by the outcomes of the report.

2. Describe how and from where participants will be recruited.

See the recruitment section above for details.

Identifying invited experts: Chosen experts would be from various sectors—academia, consultancy, NGOs, industry, and policymaking—with deep knowledge or experience on the given topic. Experts will also be selected from the 15 institutions identified initially as holding relevant expertise (Annexe 2). EWG members will actively contribute by

suggesting external experts, particularly recurring leading authors from the reviewed literature. Additionally, experts will be identified through consultations with organizations involved in related but separately timed reports, such as ICES, the European Environmental Agency, and IFREMER. The EWG will review the initial expressions of interest (EOIs) to identify experts who are interested and suitable for participation in this phase of the project.

3. Describe where the research activities will occur (for example, online, data collection tools being used, etc.)

The scoping review will be carried out using online databases. The participatory workshop will also take place online and will be delivered using Zoom. Workshop recording and Miro board will enable notetaking and summarization, as well as help capture the essence of the discussions. Consent to record will be sought beforehand as part of the recruitment phase. As such, we will have written consent for recording, but crucially, participants will have the choice to remain anonymous in any reporting of their contributions.

4. Describe any incentive participants may receive for participation.

Participants will not be remunerated for their time to avoid financial motivations for participating that may bias their inputs. They will be given the option to either be named in the final report as contributors to the request or remain anonymous.

5. How will consent be obtained from or on behalf of participants? When, where and how?

The Eklipse group responsible of compliance to the ethical infrastructure will develop guidelines for seeking consent, incorporating consent forms and conflict-of-interest declarations as essential components of the recruitment process. These forms will address confidentiality issues, and outline key participation requirements including minimum time commitments, and a summary of the workshop objectives and structure.

6. How will consent be recorded?

Consent forms will be provided at the recruitment stage and collated by the EMB. Verbal consent will be sought for the recording before the workshop.

7. Describe any ethical issues and how these will be mitigated.

External consultants, stakeholders and other participants may face conflicts of interest due to previous or recent collaboration on projects or the inability to share unpublished work. EWG members will be asked to declare possible connections to these organisations/ individuals (e.g. financial, shareholding, personal relationship etc.) when offering suggestions for the workshop. The conflict-of-interest declarations can be reviewed by the Eklipse group responsible of compliance to the ethical infrastructure for this process

and decision to include or exclude participants can be made collectively by this group and the EWG.

8. How will the results from this study (including feedback to participants) be disseminated?

A draft report of the scoping review and a briefing paper will be shared with the workshop participants beforehand. The summary of notes from the workshop will be shared for initial review by participants. The focus group and workshop input will be integrated into the final report and circulated to participants.

9. Describe how the anonymity of participants and the confidentiality of data will be protected and the specific methods to be used for this, both through the research and in the dissemination of findings.

Consent forms will include questions on anonymity, and the nature of the request and publication of findings will be explained in the form, allowing the option for experts to be - or not to be - identified. Code-naming will be used, if necessary (e.g. reviewer X1).

10. Who will have access to identifiable information? Describe any potential use of the identifiable data by others.

Eklipse group responsible of compliance to the ethical infrastructure for this process will have access to identifiable information if they attend the workshop. A sub-group of the EWG will be tasked with the analysis of the data, and the RA will devote key time to this activity under mentorship by the MEG and KCB.

11. Are there any conditions under which privacy or confidentiality cannot be guaranteed, or if confidentiality is not an issue in this research, explain why.

See above for consent and anonymity. This research does not focus on private data or confidential information. However, workshop participants will also be encouraged to adhere to principles of confidentiality.

12. Describe the methods of data analysis, how data will be stored and how long data will be stored for

Data from the project is collated and safeguarded by Eklipse processes for data collection and storage. Google drive with secured sharing to the EWG, MEG, KCB members and EMB will be used to work with the collated data for the duration of the project. The data generated from the workshop will include recordings from Zoom and meeting notes.

13. Conflict of interest - Does the EWG or any other investigator/collaborator have any direct personal involvement (e.g. financial, share-holding, personal relationship, etc.) with the organisations/individuals involved that may give rise to a potential conflict of interest?

The EWG members will be asked again to declare such possible connections before suggesting experts for the workshop. The conflict-of-interest declarations can be reviewed by the EMB and decision to include or exclude participants can be made collectively by the KCB, EMB, MEG and EWG.

14. Participant information sheet and participant consent form.

Due to the short-term nature of this request, these have not yet been finalised. These will be provided promptly for review based on Eklipse's design of forms for experts and previous enquiries. Consent forms will include questions on anonymity and the nature of the request and publication of findings will be explained in the form allowing the option for experts to be or not be identified. Code-naming will be used for anonymity (e.g. reviewer X1).

6. TIMELINE

The following key activities with milestones and proposed duration are described in Table 3.

Table 3. Overview of the methods, indicating the different tasks, milestones, and timelines.

	Description	Duration/ T
Task 1	Method protocol	2.5 months
Milestone 1	Method protocol final version	12.2024
	Method protocol peer-review finished (3 weeks allocated)	December 2024
	Reply to comments peer review.	December 2024
Task 2	Scoping review	4.5 months (16.9.2024-15.2.2025)
Milestone 2	Preliminary presentation to the requester (MSCG meeting 14 Nov 2024)	Mid-November 2024
Task 3	Scoping review	
Milestone 3	Database with quantitative and/or qualitative results	February 2025
Task 4	Workshop	February 2025

	Identification of experts for workshop	January 2025
	Invitation to workshop	January 2025
	Workshop planning	January 2025
	Workshop summaries by group experts to introduce sub-groups progress	January 2025
Milestone 4	**Analysis of workshop results**	**End February 2024**
Task 5	**Report writing**	**1 month**
Milestone 5.1	**Draft report ready for peer review**	**March 2025**
Milestone 5.2	**Report finished**	**April 2025**

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ANNEXE 1: KEYWORDS FOR SR BASED ON DESCRIPTORS OF GES AS STATED IN ARTICLE 8 OF THE EUROPEAN COMMISSION DECISION ON GES 2017/848 DOCUMENT (LINKED HERE)

Descriptors/Primary criteria	Subgroups	Keywords
D1-Marine Biodiversity	Mammals	TS = (((bat$ OR mammal$ OR whale$ OR "Minke whale" OR "Sei whale" OR "Bryde's whale" OR "Blue whale" OR "Fin whale" OR "Northern right whale" OR "Humpback whale" OR "Short-finned pilot whale" OR "Long-finned pilot whale" OR "Shortfinned pilot whale" OR "Longfinned pilot whale" OR "Risso's dolphin" OR "Northern bottle-nose whale" OR "Northern bottlenose whale" OR "Pygmy sperm whale" OR "Sowerby's beaked whale" OR "Blainville's beaked whale" OR "Gervais beaked whale" OR "True's beaked whale" OR "Melon-headed whale" OR "Melonheaded whale" OR "Sperm whale" OR "False killer whale" OR "Cuvier's beaked whale" OR "Grey seal" OR "Mediterranean monk seal" OR "Ringed seal" OR "Common seal" OR "Harbour seal" OR "Harbor seal" OR "Short-beaked common dolphin" OR "Shortbeaked common dolphin" OR "Fraser's dolphin" OR "Atlantic white-sided dolphin" OR "Atlantic whitesided dolphin" OR "White beaked dolphin" OR "Killer whale" OR "Harbour porpoise" OR "Harbor porpoise" OR "Striped dolphin" OR "Atlantic spotted dolphin" OR "Rough-toothed dolphin" OR "Roughtoothed dolphin" OR "Bottle-nosed dolphin" OR "Bottlenose dolphin" OR "Dwarf sperm whale" OR "Blainville's beaked whale" OR "Fraser's dolphin" OR "Atlantic white-sided dolphin" OR "Atlantic whitesided dolp") AND ("wind farm$ OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "Skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))

	Birds	TS = (((birds$ OR seabird$ OR waterbird$ OR "Common sandpiper" OR Razorbill OR "Little auk" OR Pintail OR Shoveler OR Teal OR wigeon OR Mallard OR "Greenland white-fronted goose" OR "Greylag goose" OR "Lesser White-fronted Goose" OR "Eurasian rock pipit" OR "Ruddy turnstone" OR "Short-eared Owl" OR "Common pochard" OR "Tufted duck" OR "Greater scaup" OR "Brent goose" OR "Canada goose" OR "Barnacle goose" OR "Red-breasted Goose" OR "Common goldeneye" OR "Bulwer's petrel" OR Sanderling OR Dunlin OR "Greenland dunlin" OR "Red knot" OR "Curlew sandpiper" OR "Purple sandpiper" OR "Little stint" OR "Cory's Shearwater" OR "Scopoli's shearwater" OR "Black guillemot" OR "Pied kingfisher" OR "Kentish Plover" OR "Ringed plover" OR "Greater sand plover" OR "Black tern" OR "Black stork" OR "Long-tailed duck" OR "Bewick's swan" OR "Tundra swan" OR "Whooper swan" OR "Mute swan" OR "Little egret" OR "Eleonora's falcon" OR "Peregrine Falcon" OR Puffin OR Coot OR "Northern fulmar" OR "White-billed diver" OR "Black-throated diver" OR "Great northern loon" OR "Red-throated loon" OR "red-throated diver" OR Oystercatcher OR "White-throated kingfisher" OR "white-tailed sea-eagle" OR "Black-winged stilt" OR "European storm petrel" OR "Mediterranean storm petrel" OR "Little gull" OR "Herring gull" OR "Armenian Gull" OR "Audouin's gull" OR "Common gull" OR "Lesser black-backed gull" OR "Slender-billed gull" OR "Iceland gull" OR "Glaucous gull" OR "Great black-backed gull" OR "Mediterranean gull" OR "Yellow-legged gull" OR "Little gull" OR "Black-headed gull" OR "Bar-tailed godwit" OR "Black-tailed godwit" OR "Velvet scoter" OR "Common scoter" OR skew OR "Common merganser" OR goosander OR "Red-breasted merganser" OR "Northern gannet" OR Curlew OR whimbrel OR "Slender-billed Curlew" OR "Band-rumped Storm-Petrel" OR "Leach's storm petrel" OR "Monteiro storm-petrel" OR "Ivory gull" OR Osprey OR "Bearded Reedling" OR "White-faced storm petrel" OR "Dalmatian Pelican" OR "Great White Pelican" OR "White Pelican" OR "European shag" OR "Mediterranean shag" OR "Great cormorant" OR "Pygmy cormorant" OR "Grey phalarope" OR "Red-necked phalarope" OR Ruff OR "American flamingo" OR "Eurasian spoonbill" OR "Glossy Ibis" OR "Golden plover" OR "Grey plover" OR "Slavonian grebe" OR "Great crested grebe" OR "Red-necked grebe" OR "Black-necked grebe" OR "Steller's eider" OR "Desertas petrel" OR "Fea's petrel" OR "Zino's petrel" OR "Little shearwater" OR "Barolo shearwater" OR "Great shearwater" OR "Sooty shearwater" OR "Audubon's shearwater" OR "Balearic shearwater" OR "Manx shearwater" OR "Mediterranean shearwater" OR "Yelkouan shearwater" OR "Pied avocet" OR "Black-legged kittiwake" OR "Common eider" OR "King eider" OR "Long-tailed skua" OR "Arctic skua" OR "Pomarine skua" OR "Great skua" OR "Lesser Crested Tern" OR "Caspian tern" OR "Roseate tern" OR

		"Common tern" OR "Gull-billed tern" OR "Sandwich tern" OR "Arctic tern" OR "Little tern" OR "Rosy Starling" OR "Little Grebe" OR "Ruddy Shelduck" OR Shelduck OR "Spotted redshank" OR "Wood sandpiper" OR greenshank OR Redshank OR "Common guillemot" OR "Iberian guillemot" OR "Iberian guillemot" OR "Brünnich's guillemot" OR Lapwing) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
	Reptiles	TS = (((reptile$ OR "sea turtle$" OR "loggerhead turtle" OR "green turtle" OR "leatherback turtle" OR "hawksbill turtle" OR "kemp's ridley turtle") AND ("wind farm$ OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
	Cephalopods	TS = (((cephalopod$s OR squid$ OR octopus OR cuttlefish OR "Curled octopus" OR "Musky octopus" OR "Shortfin squid" OR "Inshore squid" OR "European squid" OR "Common octopus" OR "Giant African Cuttlefish" OR "Common cuttlefish" OR "Pink cuttlefish" OR "Flying squid" OR "Lesser flying squid") AND ("wind farm$ OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "Skagerak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))

	Fish	TS = ((((fish AND coastal OR pelagic OR demersal OR deep) OR anchovy OR anglesharp OR angler OR anglerfish OR antimoral OR bandish OR barracuda OR bigeye OR blenny OR bluefin OR bream OR brook OR bullhead OR catshark OR chub OR cod OR comber OR conger OR dab OR dentex OR dogfish OR dolphinfish OR dory OR drum OR eel OR filefish OR flounder OR forkbead OR goby OR greeneyi OR grenadier OR grouper OR grunt OR gulper OR gurnard OR hake OR halibut OR hammerhead OR herring OR hagfish OR killifish OR lamprey OR ling OR loach OR mackerel OR mako OR meagre OR megrim OR minnow OR moray OR mullet OR perch OR picardy OR pike OR pilchard OR pipefish OR plaice OR pomfret OR pout OR rabbitfish OR ray OR redfish OR rockfish OR rocking OR rockfish OR roughstalk OR roughy OR salmon OR sandeel OR sardinella OR saury OR sawfish OR scabbardfish OR scaleback OR scalefish OR scorpionfish OR sculpin OR seabass OR seabream OR seahorse OR seasnails OR sevengill OR shad OR shark OR monkfish OR sigill OR skate OR slickheads OR slimeheads OR snipefishes OR snouted OR sole OR spiny OR spotted OR sprat OR spurion OR stargazer OR starry OR stickleback OR stingray OR sturgeon OR sunfish OR tiger OR toadfish OR toothcarp OR topknots OR torpedo OR trout OR tuna OR tenny OR weever OR whitefish OR whiting OR wolffish OR wrasse OR yellowtail)) AND (”wind farm$ OR windfarm$ OR ”wind energy” OR ”wind park$” OR ”windpark$” OR ”wind power station$” OR wind power plant$” OR ”wind turbine$”) AND (”baltic sea” OR ”north sea” OR ”kattegat” OR ”skagerrak” OR ”English channel” OR ”celtic sea” OR ”bay of biscay” OR ”iberian coast” OR ”macaronesia” OR ”mediterranean sea” OR ”ionian sea” OR ”tyrrhenian sea” OR ”adriatic sea” OR ”aegean sea” OR ”levantine sea” OR ”ligurian sea”OR ”black sea”))
D2-NIS		TS = (((species NEAR/15 ”non-indigenous” OR alien OR exotic OR ”non-native” OR allochthonous) AND (”wind farm$ OR windfarm$ OR ”wind energy” OR ”wind park$” OR ”windpark$” OR ”wind power station$” OR wind power plant$” OR ”wind turbine$”) AND (”baltic sea” OR ”north sea” OR ”kattegat” OR ”Skagerak” OR ”English channel” OR ”celtic sea” OR ”bay of biscay” OR ”iberian coast” OR ”macaronesia” OR ”mediterranean sea” OR ”ionian sea” OR ”tyrrhenian sea” OR ”adriatic sea” OR ”aegean sea” OR ”levantine sea” OR ”ligurian sea”OR ”black sea”)))
D3-Commercial fish and shellfish		TS = (((fisheries OR stock$ OR ”commercially exploited fish and shellfish” OR (”commercially exploited” NEAR/15 fish OR shellfish)) AND (”wind farm$” OR windfarm$ OR ”wind energy” OR ”wind park$” OR windpark$ OR ”wind power station$” OR ”wind power plant$” OR ”wind turbine$”) AND (”baltic sea” OR ”north sea” OR ”kattegat” OR ”skagerrak” OR ”English channel” OR ”celtic sea” OR ”bay of biscay” OR ”iberian coast” OR ”macaronesia” OR ”mediterranean sea” OR ”ionian

	sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D4-Food Web	TS = ((("food web$ OR "food chain$" OR "trophic web$" OR "trophic level$ OR autotroph$ OR heterotroph$ OR phytoplankton OR diatoms OR dinoflagellates OR mesozooplankton OR copepods OR cladocerans OR "benthic filter-feeding invertebrate$" OR "benthic feeding invertebrate$" OR "planktivorous fish" OR "planktivorous invertebrate$" OR "sub-apex pelagic predator$" OR predator$ OR "sub-apex demersal predator$" OR "apex marine mammal predator$" OR "apex predator$" OR "apex fish predator$") AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "Skagerak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D5-Eutrophication	TS = (((nutrient$ OR nitrogen OR "dissolved inorganic nitrogen" OR DIN OR phosphorus OR "dissolved inorganic phosphorus" OR DIP OR "total phosphorus" OR TP OR "total nitrogen" OR TN OR "chlorophyll-a" OR "phytoplankton biomass" OR "dissolved oxygen" OR "harmful algal bloom" OR HAB OR cyanobacteria OR dinoflagellates) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "Skagerak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D6-Seabed Integrity	TS = ((("seabed integrity"OR morphology OR "ecosystem loss" OR "habitat loss" OR substrate OR sediment* OR (abrasion OR dredg* OR "physical loss" OR "physical disturbance" OR damage OR degradation NEAR/5 seabed OR seabottom OR seafloor OR benthic)) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))

D7-Hydrological conditions	TS = ((("hydrographical condition$" OR "hydrographical regime$" NEAR/15 temperature OR salinity OR current$ OR wave$ OR turbidity OR bathymetry OR tide$ OR wake OR stratification) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D8-Contaminants	TS = (((contaminant$ OR metal$ OR lead OR cadmium OR mercury OR copper OR polyaromatic OR hydrocarbon$ OR PAH$ OR "perfluorooctane sulfonate$" OR PFOS OR "hexabromocyclododecane" OR HBCDD OR "polybrominated diphenyl ether$" OR PBDE$ OR "polychlorinated biphenyl$" OR PCB$ OR dioxin$ OR furan$ OR tributyltin OR TNT OR "cesium-137" OR PFAS OR "organochlorinated pesticide$" OR lindane OR aldrin OR dieldrin OR HCB OR DDT$ OR heptachlor) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D9-Contaminants in Food	TS = ((((contaminant*) NEAR/15 (seafood OR lead OR cadmium OR mercury OR dioxins OR PCB$ OR PAH$)) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "Skagerak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D10-Marine litter	TS = (((debris OR scap OR pollution OR waste OR litter OR plastic$ OR rubber OR cloth OR textile OR paper OR cardboard OR "processed wood" OR glass OR ceramic$ OR chemical$ OR "single-use plastic$" OR microlitter OR microplastic$ OR particle$) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian

	sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))
D11-Energy and Noise	TS = (((vibration$ OR noise$ OR sound$ OR light OR "electromagnetic field$" OR decibel$ OR drilling OR piling OR "pile driving" OR "soft-start" OR "hydro sound damper" OR "hammer energy" NEAR/15 "man-made" OR anthropogenic OR "long lasting" OR continuous OR "short duration" OR "masking auditory" OR underwater OR impulsive OR intermittent OR "high frequency" OR "low frequency" OR intensity) AND ("wind farm$" OR windfarm$ OR "wind energy" OR "wind park$" OR windpark$ OR "wind power station$" OR "wind power plant$" OR "wind turbine$") AND ("baltic sea" OR "north sea" OR "kattegat" OR "skagerrak" OR "English channel" OR "celtic sea" OR "bay of biscay" OR "iberian coast" OR "macaronesia" OR "mediterranean sea" OR "ionian sea" OR "tyrrhenian sea" OR "adriatic sea" OR "aegean sea" OR "levantine sea" OR "ligurian sea"OR "black sea")))

ANNEXE 2: INSTITUTIONS IDENTIFIED INITIALLY AS HOLDING RELEVANT EXPERTISE

Institutions/Initiatives
CSA Working Group on Offshore Wind Development and Fisheries
Wind Energy-Environmental Research & Engagement Network (WREN)
European Marine Board
Environmental Effects of Wind and Marine Renewable Energy (Tethys)
France Energies Marines (A)
International Network on Offshore Renewable Energy (INORE)
Bureau of Ocean Energy Management) Studies (BOEM)
Marinerg-i EU project, scientific, business and implementation plan for an integrated European Research Infrastructure designed to facilitate the future growth and development of the Offshore Renewable Energy sector.
Marine Collaboration Research Forum (MarCRF)
Office of Technology Assessment at the German Bundestag (TAB)
Baltic wind EU
European Environmental Agency (EEA)
International Council for the Exploration of the Sea (ICES)
French Institute for Ocean Science (Ifremer)
GNSBI Work track Cumulative impact assessment (WT CIA)