PROPOSED NAVITUS BAY WIND PARK

PRELIMINARY ENVIRONMENTAL INFORMATION 3

CHAPTER 3
ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

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NAVITUSBAY

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3. EIA METHODOLOGY

3.1. Introduction

3.1 This chapter describes the Environmental Impact Assessment ('EIA') process for the proposed Navitus Bay Wind Park Project ('the Project'). This includes an overview of the methodology used to identify, assess and mitigate environmental impacts associated with the construction, operation and maintenance, and decommissioning phases of the Project.

3.2 The EIA is being undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended, 2012) ('the EIA Regulations'). These Regulations transpose the European Council Directive 85/337/EEC (as amended by Directive 97/11/EC) ('the EIA Directive') into UK law and apply to all UK Nationally Significant Infrastructure Projects ('NSIPs').

3.3 The purpose of an EIA is to ensure that the decision-maker takes into account full environmental information on the likely significant environmental effects of a development before deciding whether or not to grant development consent. This information is presented in an Environmental Statement that is submitted in support of an application for development consent.

3.4 An Environmental Statement presents objective information necessary to determine whether a project will give rise to 'likely significant environmental effects.'[1] The process of compiling an Environmental Statement is a systematic and evidence based process, comprising the following broad steps shown in Figure 3.1 and also explained in the following sections.

- **Scoping** of the issues to be considered in the ES;
- **Baseline data collection (as set out in Section 3.3)**, through surveys and desk based work, to describe the existing environmental conditions;
- Identifying and **assessing the potential impacts (as set out in Section 3.4)**; and
- Identifying **mitigation measures (as set out in Section 3.5).**

3.5 The EIA Methodology applied to the Project is based on widely used EIA principles and has regard to a comprehensive range of guidance, legislation and policy documents.

3.6 Comments on this methodology have also been sought from statutory consultees, and where appropriate include comments on the assessment of individual topics. A Scoping Opinion was also requested in 2011, from the Infrastructure Planning Commission ('IPC') (now the Planning Inspectorate) which included advice on the methodology, all of which have been duly considered.

3.7 As the preparation of an ES for the Project remains on-going at this time, it is important to note that this PEI3 document sets out the current information and knowledge at the time of publication. Where this is the case, work is progressing in line with the EIA Methodology set out in this chapter and consultation remains on-going with the relevant consultees. Therefore, the level of detail may therefore vary between individual topics, including, for example, the level of detail on proposed mitigation.

3.8 In addition, a small number of areas of the ES are not yet complete, including the assessment of interrelationships, the cumulative impact assessment ('CIA') and identification of potential transboundary impacts. The methodology for these assessments is set out in this chapter and the full information will be presented in the Environmental Statement ('ES'), which will accompany the application for development consent, scheduled for submission early in 2014.

[1] The phrasing 'likely significant environmental effects' is used in the EIA Regulations.

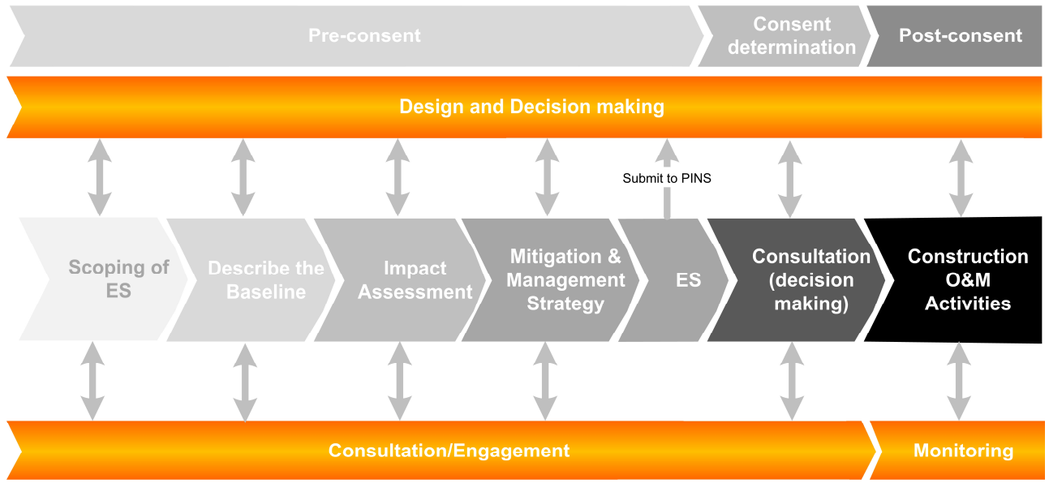

Figure 3.1 Overview of the EIA process

3.2. Approach to the ES and the Rochdale Envelope

3.9 The approach to the ES is based on the established principle of the 'Rochdale Envelope' and the drafting of the ES will be in line with the Planning Inspectorate's Advice Note Nine regarding the Rochdale Envelope, consistent with the objectives of the EIA Directive and EIA Regulations.

3.10 The Rochdale Envelope is based on the cases of R v Rochdale Metropolitan Borough Council ex p Milne (2000) and R v Rochdale Metropolitan Borough Council ex p Tew (1999).

3.11 This approach has been adopted because it will not be possible to fully define the final project design at the time the application for development consent is made. As a result, the project design (including size of turbine and foundation type) will not be determined until after a decision is made by the Secretary of State and further geotechnical investigations, detailed engineering design and procurement have been undertaken.

3.12 The Rochdale Envelope for Navitus Bay is based on the project design parameters set out in Chapter 2. These parameters are used to assess the maximum adverse scenario for each receptor, which is called the 'realistic worst case scenario' ('RWCS').

3.13 For example, the greatest benthic habitat loss will be associated with the largest seabed area occupied by gravity base foundations, whereas the greatest impact on aviation radar would arise from the tallest turbines, owing to their height. The realistic worst case scenario differs from topic to topic and is based on the full range of design options set out in Chapter 2.

3.14 In each individual assessment in this PEI3 document, the RWCS relevant to the topic is described. This then forms the basis of the impact assessment. The end result will be an ES based on clearly defined parameters that govern the full range of development possibilities. This means that the Secretary of State can be confident that the environmental impacts of the Project would be no greater than those described in the ES.

3.3. Determining the Baseline Environment

3.15 A key part of the assessment process involves the collection of baseline data (e.g. commissioned field surveys, data purchase and desk based literature reviews). This provides the means to assess potential changes in the environment as a result of the Project.

3.16 Individual chapters within this PEI3 document, set out their relevant baseline, including a description of the methods and techniques used to gather the data.

3.17 All survey methodologies have been agreed with key statutory bodies including Natural England ('NE'), the Centre for Environment, Fisheries and Aquaculture Science ('Cefas'), the Marine Management Organisation ('MMO'), the Maritime and Coastguard Agency ('MCA') and English Heritage ('EH').

3.18 Several long term survey campaigns have also been undertaken to inform baseline. These include:

- A boat-based bird surveys over a two year period across the Turbine Area and Zone (December 2009 to November 2011). This included additional migration and aerial-based studies to inform assessments of the seasonality of bird movements and observations of marine mammal sightings;
- One year of Acoustic Doppler Current Profilers ('ADCPs') deployed at four locations across the Turbine Area to collect data on prevailing waves and currents climates (November 2011to December 2012).

- Marine mammal movements were recorded using the acoustic devices C-PODs, which were deployed at two locations across the Turbine Area and a further six locations between the Turbine Area and Swanage Bay (November 2011 to February 2013).

3.4. Assessment Methodology

3.19 The EIA Regulations require the identification of the likely significant effects of the Project and this section describes how potential impacts are determined and assessed, and how the impact significance is reached. Figure 3.2 shows an overview of the assessment methodology used for this Project.

3.20 The terms 'effect' and 'impact' used in this PEI3 and subsequent ES drafting have distinct meanings as set out below:

An Effect is set in motion because of a particular activity or activities (e.g. placement of gravity bases onto the seabed, piling or trenching) and is usually measurable (e.g. volume, area, or sound pressure in decibels).

An impact is a perceived change in the baseline as a result of an effect, which can be beneficial, adverse or neutral as shown in Table 3.1.

For example, the placement of a gravity base onto the seabed would increase suspended sediment concentrations (an effect), which in turn may reduce the ability of visual predators (e.g. fish or marine mammals) to hunt, thereby reducing foraging success (an impact) and potentially leading to a population decline (an indirect impact).

Table 3.1 Impact definitions	
Direct Impact	Arises from activities occurring as a result of the proposed Project.
Indirect Impact	Occurs as a consequence of a direct impact, often as part of a chain of events.
Adverse Impact	Results in an adverse change to baseline conditions.
Neutral Impact	No detectable change to baseline.
Beneficial impact	Results in an improvement to baseline conditions.
Temporary Impact	Impacts that are intermittent or occasional in nature

Table 3.1 Impact definitions

	and are reversible, i.e. are not permanent.
Permanent Impact	An impact that causes a permanent change in the affected receptor and continues indefinitely beyond the life of the Project.

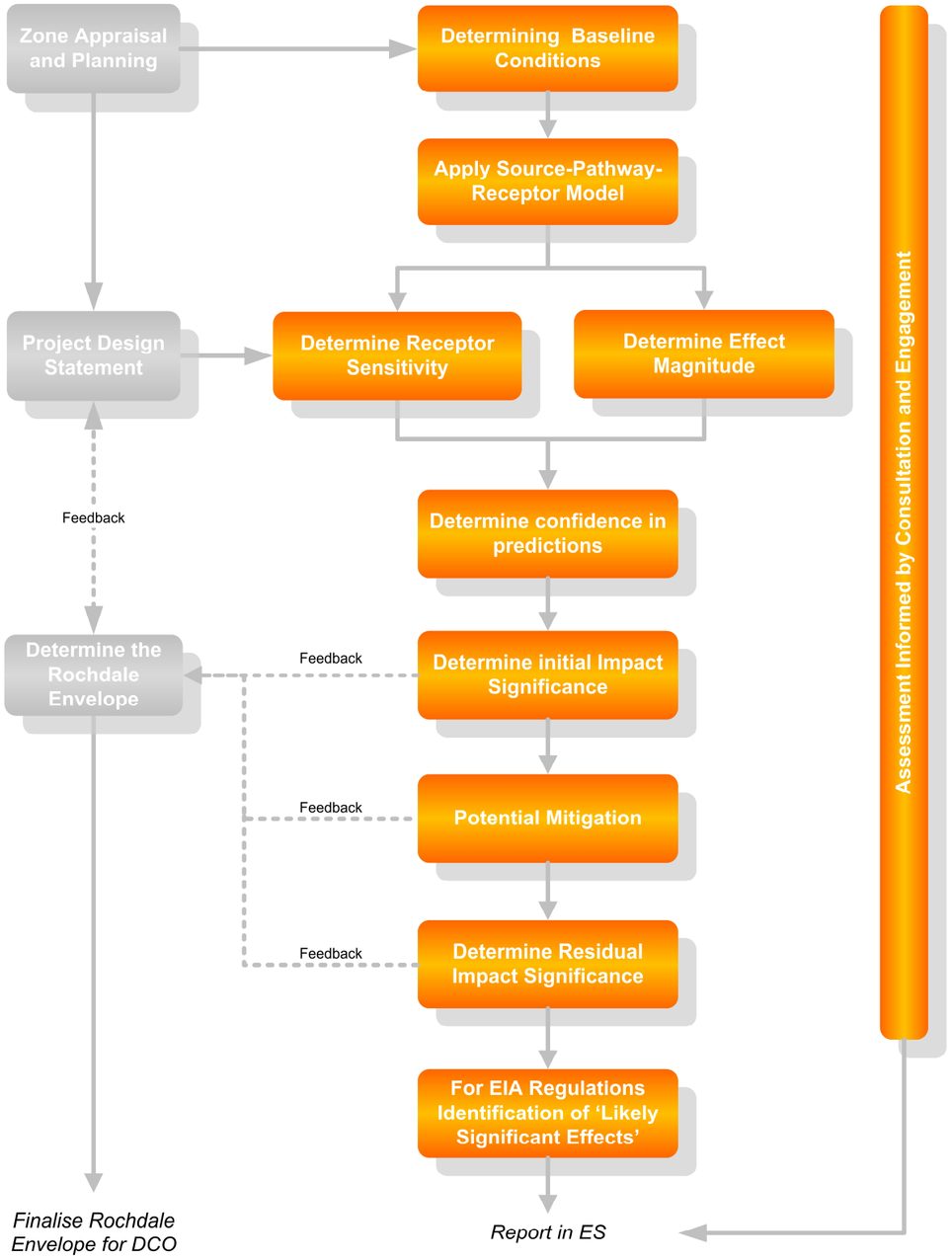

Figure 3.2 Overview of steps in assessment methodology

3.4.1. Source-pathway-receptor model

3.21 The source-pathway-receptor model illustrated in Figure 3.3 is being used to establish the relationship between the effects generated and the receptor considered at risk.

3.22 In the example provided in Figure 3.3, the source represents an activity related to the construction (e.g. piling). The pathway represents the route through the environment by which the effects of an activity are transmitted (e.g. increased turbidity or pulse of noise) to potential receptors. The receptor is the environmental (animal) or resource (viewpoint) unit that receives the effect.

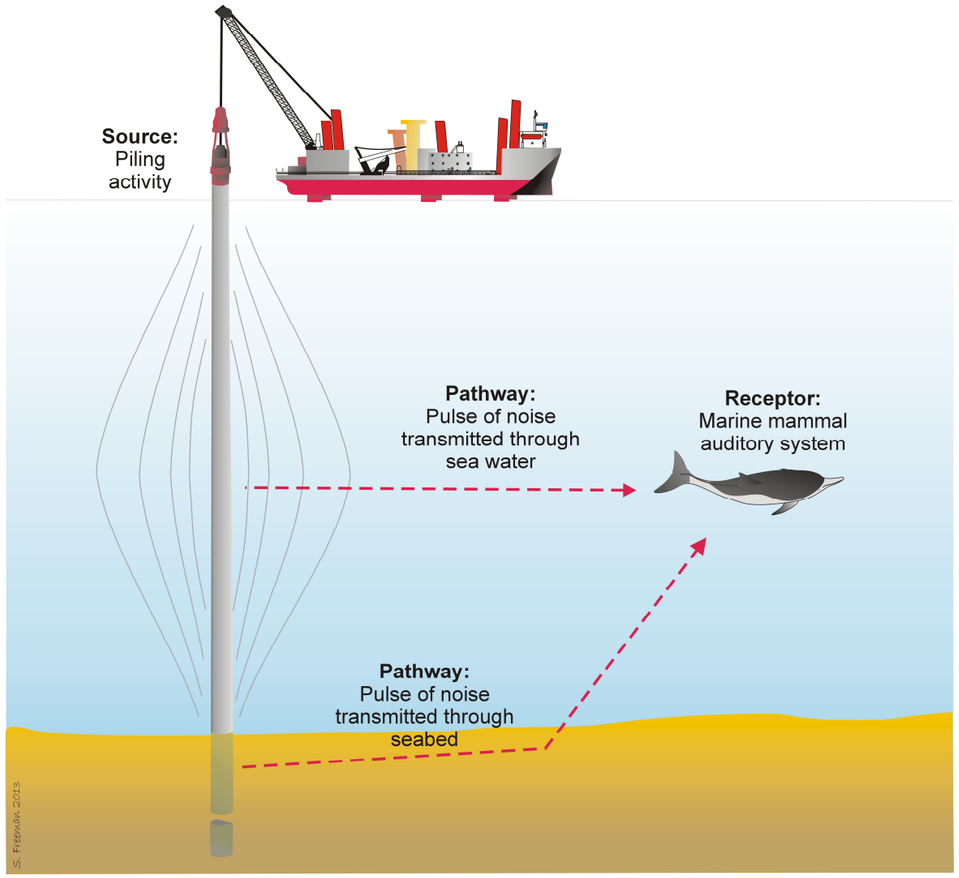

Figure 3.3 Illustration of source-pathway-receptor model

3.4.2. Determination of Impact Significance

3.23 In order to determine and predict potential impacts, the sensitivity of the receptor and the magnitude of the effect are taken into account. Together, these are assessed to determine the impact significance.

- **The Sensitivity of the Receptor** is characterised by the receptor's ability to tolerate and recover from changes in the environment, as well as its importance to society (e.g. a statutory designation).
- **The Magnitude of Effect** provides an indication of the scale and direction of change in the environment following an activity and includes consideration of the variables set out below.

Extent: this is the area over which an effect may occur and this may be site specific, local, regional, national or transboundary.

Duration: this is the length of time that an effect is measured against. For example, elevated noise levels during pile driving are short-lived, intermittent and are typically measured in hours. Examples of duration are short term, medium term or long term.

Frequency: this is a measure of how often an effect occurs compared to natural variation. Frequency could be continuous or intermittent.

3.24 To categorise and define sensitivity (tolerance, recoverability and importance) and magnitude (extent, duration and frequency), four categories of **high, medium, low** and **imperceptible** have been used to assign overall assign sensitivity and magnitude.

3.25 The **impact assessment matrix** is central to the assessment methodology and is shown in Figure 3.4. This is used to determine the significance of the impact, based on the sensitivity of a receptor and magnitude of effect. The matrix provides a framework for the consistent assessment of impacts across all topics. Judgement relating to the position on the matrix is based on professional opinion.

3.26 Where this approach cannot be applied in the case of risk-based topics (i.e. shipping and navigation or maritime archaeology) and other topics where there is specific guidance (e.g. landscape and visual), this is explained in the relevant topic specific chapter.

Magnitude of effect \ Sensitivity of a receptor	High	Medium	Low	Imperceptible
High	Major	Major OR Moderate	Moderate OR Minor	Negligible
Medium	Major OR Moderate	Moderate Minor	Minor	Negligible
Low	Moderate OR Minor	Minor	Minor	Negligible
Imperceptible	Negligible	Negligible	Negligible	Negligible

Figure 3.4 Impact significance matrix

3.27 As shown in Figure 3.4, impacts are categorised as negligible, minor, moderate or major and can be beneficial, neutral or adverse.

3.28 To comply with the EIA Regulations, impacts will be reported as either '**Significant**' (in this case, those that are moderate or major) or '**Not Significant**' (in this case, those that are minor or negligible).

3.5. Mitigation Measures

3.29 Schedule 4 of the EIA Regulations states that the ES should include "*a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment*". Some mitigation measures are set out within this PEI3 document for discussion with consultees. These are defined as either:

- **Embedded mitigation**: which are measures incorporated into the design of the Project and are effectively "built in" to the project upfront. As such, the assessment includes prior consideration of these measures. There are a range of embedded mitigation measures and those relevant to each receptor are provided within topic-specific chapters of this PEI3

document. Activities are also controlled through legislative compliance and standard good practice, also a form of embedded mitigation.

- **Additional mitigation:** are additional to any embedded mitigation and are particularly required where significant adverse effects are predicted through the impact assessment. Such measures may include construction or operational controls, as well as management actions, such as restoration.

3.30 At this stage, a number of mitigation measures have been considered and, where possible, these are set out as part of this PEI3 document. Additional mitigation is not automatic. The final mitigation is dependent upon further discussion with consultees prior to inclusion within the application for development consent, where possible. The Code of Construction Practice ('CoCP'), described in Chapter 2, will also form part of the application for development consent, outlining management measures and environmental controls that contractors would be required to adopt during the construction phase of the onshore components.

3.31 Following the identification of additional mitigation measures, the potential impacts would be re-assessed and any residual impact significance identified. At this stage, these are not set out as part of this PEI3 but will be as part of the ES that will form part of the application for development consent.

3.6. Interrelationships Assessment

3.32 The EIA Regulations require an assessment of interrelationships, Figure 3.5 provides an example which shows noise from piling which could affect the echo location ability of cetaceans, whilst concurrently increasing suspended sediments from jetting which may prevent hunting for prey.

3.33 There is no definitive guidance on how an assessment of interrelationships might be undertaken, however regard will be had to the Planning Inspectorate's Advice Note Nine and Schedule 4 of the EIA Regulations.

3.34 Ultimately, the assessment of interrelationships is qualitative and uses the impact assessment findings from each EIA topic and consideration of professional opinion. Because the assessment adopts a realistic worst-case approach, it is precautionary in nature and so interrelationships will typically be reported as greater than is likely to be manifested. The work on interrelationships remains on-going at the time of the publication of this PEI3 document and the outcomes will be presented in the ES in due course.

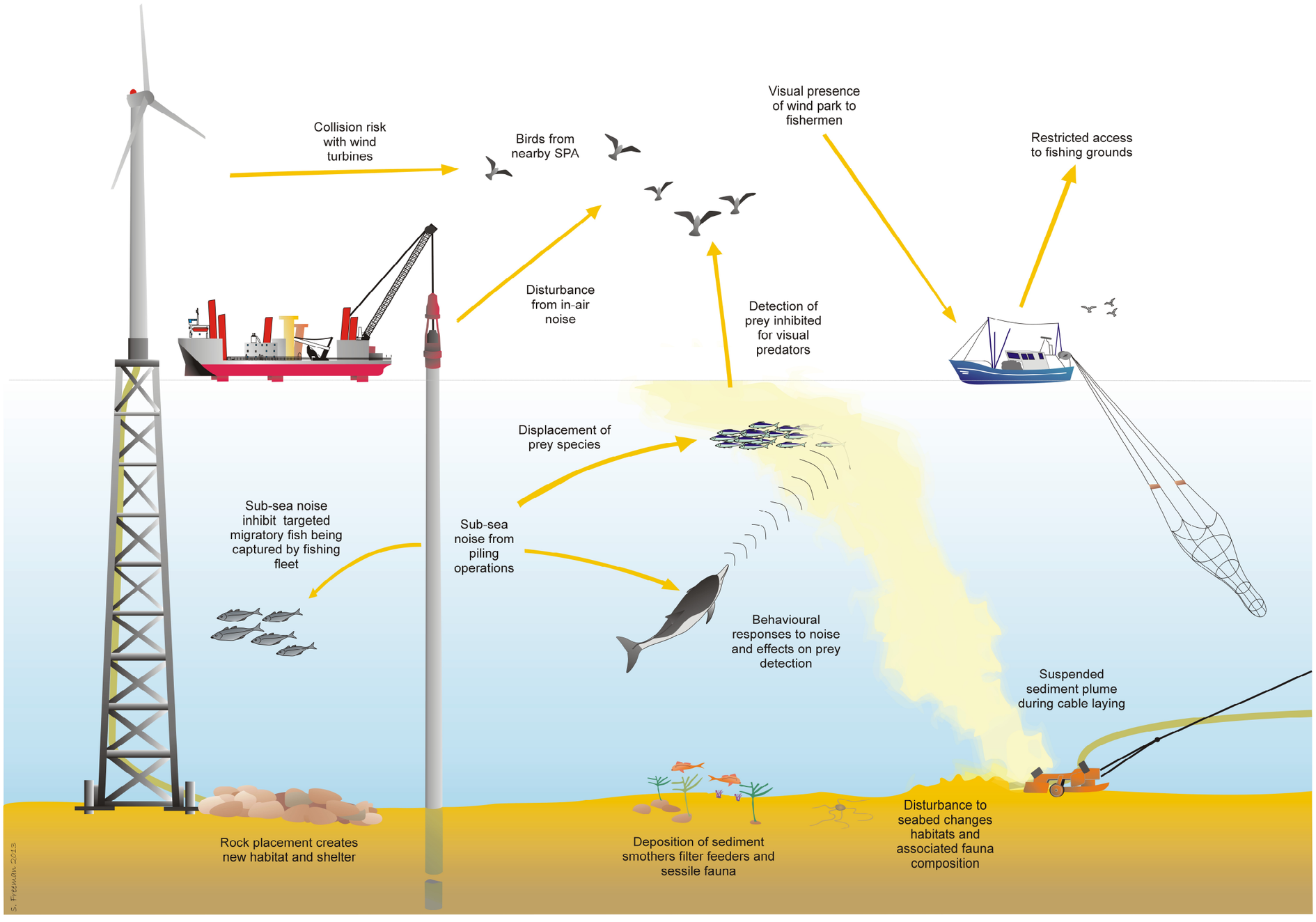

Figure 3.5 Explanation of interrelationships

3.7. Cumulative Impact Assessment

3.35 EN-1 advises that when considering cumulative effects, information should be provided on "*how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence)*".

3.36 There is currently no universally recognised standard for conducting Cumulative Impact Assessment ('CIA'). However, for this Project, the definition used for cumulative impacts is based on the Renewable UK (RUK) principles as set out in Table 3.2.

Table 3.2 Definition of cumulative impacts

RUK Definition (adapted from Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (EC 1999)).	"*The additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments, taken together. This includes non-renewable projects currently built and plans identified through consultation and those that result from additive impacts caused by other past, present or reasonably foreseeable actions*."

3.37 The following considerations are being taken into account when undertaking the CIA for the Project:

- Identification of both temporal and spatial extents of potential interactions. This is being achieved using a Zone of Influence ('ZoI') approach;
- Identification of pathways, where the potential effects of the Project interact with effects from other projects and plans; and
- Consultation with stakeholders to identify plans or projects that may interact and have a cumulative impact with the Project.

3.38 Advice Note Nine recommends this through consultation on the basis that the relevant projects are either:

- "*Under construction*
- *Permitted application(s), but not yet implemented*
- *Submitted application(s) not yet determined*
- *Projects on the Planning Inspectorate's Programme of Projects*
- *Identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited*
- *Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward"*

3.39 The projects and plans that are being assessed in the CIA include:

- Onshore and offshore wind farms
- Onshore projects and plans
- Aggregate extraction activity
- Aquaculture
- Coastal defences
- Recreational activities
- Coastal development
- Commercial fishing activities
- Linear infrastructure (Cables and pipelines inclusive of outfalls, Carbon Capture and Storage)
- Oil and Gas activity (existing, planned and licence blocks pending award, activities licensed under Petroleum Operations Notices 14 (PON14) applications)
- Marine disposal activity
- Capital and Maintenance dredging
- Shipping and Navigation (routes, anchorage etc.)
- Military sites and activities
- Other energy generation (e.g. marine renewables)

3.40 Where projects and plans do not overlap with the ZoI, they will be scoped out as there is no opportunity for cumulative interactions with the Project.

3.41 It should be noted, the term 'in-combination' is a specific term used under the Habitats Regulations and is not considered as part of the CIA.

3.42 The work on the CIA remains on-going at the time of the publication of this PEI3 and the outcomes will be presented in the ES in due course.

3.8. Transboundary Effects

3.43 Under Regulation 24 of the EIA Regulations, the Planning Inspectorate must determine if a development is likely to have significant effects on the environment of another European Economic Area ('EEA') State.

3.44 If the Planning Inspectorate determines that significant effects may occur, then it will:

- Provide initial notification to the EEA State(s) and send a description of the proposed project, together with any available information on its possible significant effects on the environment in another EEA State; and
- Publish a note in the London Gazette setting out the information about the proposed project, to allow the EEA state to indicate whether it would wish to participate in procedures.

5.39. To support this, the EIA Methodology, in compliance with Advice Note Twelve, will:

- Provide a screening matrix to identify both the possible significant effects or, where applicable, why they consider that there would not be any significant effects on the environment of another EEA State;
- Write to the EEA States identified by the Planning Inspectorate to inform them of our intention to include them in our formal Section 42 consultation; and
- As part of the Section 42 consultation, send a draft application, including its supporting Environmental Statement, to the relevant EEA State(s) and any identified environmental bodies within that State, as soon as these are sufficiently detailed to enable meaningful comments to be made to developers about the potential significant effects and the proposed mitigation measures.

3.45 The Secretary of State issued a Transboundary Impacts Consultation Screening Matrix on the 31 July 2012 and the EEA States notified were:

- The Netherlands
- Belgium
- France
- Spain

3.46 Consultation in respect of transboundary matters for the Project remains on-going at the time of the publication of this PEI3 and the outcomes will be presented in the ES in due course.

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Glossary

TERM	DEFINITION
Duration	Duration is the length of time that an effect is measured against.
Effect	Effects are set in motion because of a particular activity or activities and are usually measurable.
Embedded mitigation	Mitigation measures that are incorporated into the design of the Project.
Extent	Extent is the area over which there is a potential for an effect to occur.
Impact	An impact is a perceived change in the baseline as a result of an effect, which can be beneficial, adverse or neutral.
Importance	The importance of a receptor to society (e.g. its protection under a statutory designation, or economic value to the local community).
Interrelationships	Interrelationships consider discrete and separate impacts of the Project on the same receptor.
Magnitude	Magnitude of effect provides an indication of the scale and direction of change in the environment following an activity.
Project	Proposed Navitus Bay Wind Park Project that includes onshore and offshore elements to be submitted for an application for development consent.
Rochdale Envelope	A planning tool used to allow the Project design to be assessed with sufficient flexibility in engineering design at the time of consent submission for development consent.
Sensitivity	The receptor's ability to tolerate and recover from changes in the environment, as well as its importance to society.
Tolerance	Tolerance is the sensitivity of a receptor to disturbance, damage or loss from an external factor.
Transboundary	Effects that extend beyond the national borders, i.e. beyond territorial waters.

Abbreviations

TERM	DEFINITION
CIA	Cumulative Impact Assessment
COWRIE	Collaborative Offshore Wind Research Into Environment
CPA	Coast Protection Act 1949
DCO	Development Consent Order
EIA	Environmental Impact Assessment
ES	Environmental Statement
FEPA	Food and Environment Protection Act 1985
HRA	Habitat Regulations Assessment
ICES	International Council for the Exploration of the Sea
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment
IPC	Infrastructure Planning Commission
MMO	Marine Management Organisation
RAG	Regulatory Advisory Group
RUK	RenewableUK
SoS	Secretary of State
ZAP	Zone Appraisal and Planning
ZoI	Zone of Influence