

Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm

Environmental Statement Volume 1
Annex 2-1: HRA Screening

Appendix I: Implications of Sweetman Ruling

June 2018, Revision A

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Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm
Annex 2-1: HRA Screening
Appendix I: Implications of Sweetman Ruling
June 2018

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Vattenfall Wind Power Ltd

**Thanet Extension Offshore Wind Farm
Preliminary Environmental Information Report**

Volume 4

Annex 8-1: HRA Screening Report



Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm
Volume 4
Annex 8-1: HRA Screening Report
November 2017

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1 Introduction

1.1 Introduction to Thanet Extension

1.1.1 Vattenfall Wind Power Ltd (VWPL) is proposing the development of the Thanet Extension Offshore Wind Farm (Thanet Extension). The project would be located approximately 8 km offshore (at its closest point) from the Kent coast, in proximity to the operational Thanet Offshore Wind Farm (TOWF). It would have a generation capacity of up to 340 MW. Electricity generated would be transported to the shore by offshore export cables installed within the proposed offshore export cable corridor to the landfall, then through underground cables installed within the proposed onshore cable corridor to an onshore substation.

1.1.2 The location of Thanet Extension (including the wind farm array, offshore and onshore cable corridors and the onshore substation area of search (AoS) is presented in Figure 1.1. It should be noted that the focus of this screening report is aligned with the wider project which is to focus effort on one of the two options put forward at the scoping stage - the northern route 'Pegwell Bay' option. The sites identified within this report apply equally to both options with no other sites being screened in specifically due to the southern 'Sandwich Bay' option however the narrative focusses on the northern route alone.

1.2 Purpose of this Report

1.2.1 This document has been produced to inform the Habitat Regulations Assessment (HRA) process for the Thanet Extension. It provides information to enable the Screening of the project with respect to its potential to have a likely significant effect (LSE) on European sites of nature conservation importance. This step in the process and associated reporting requirements are further described in the following Sections.

1.2.2 In this context, European sites are defined as Special Areas of Conservation (SACs and cSACs) and Sites of Community Importance (SCIs) designated under the Habitats Directive (92/43/EEC) and Special Protection Areas (SPAs) designated under Council Directive (2009/147/EC) on the conservation of wild birds (the 'Birds Directive'). In addition to sites designated under European nature conservation legislation, UK Government policy (ODPM Circular 06/2005) states that proposed SPAs and SACs and internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs, for the purpose of considering development proposals that may affect them.

1.2.3 The European Commission's guidance on Planning for the Protection of European Sites: Appropriate Assessment (2001) identifies a staged process to the assessment of the effects of plans of projects on European sites. Cumulatively, these stages are referred to as the Habitats Regulations Assessment (HRA), in order to clearly distinguish the whole process from the second stage within it, which is referred to as the 'appropriate assessment' (AA). There are potentially up to four stages:

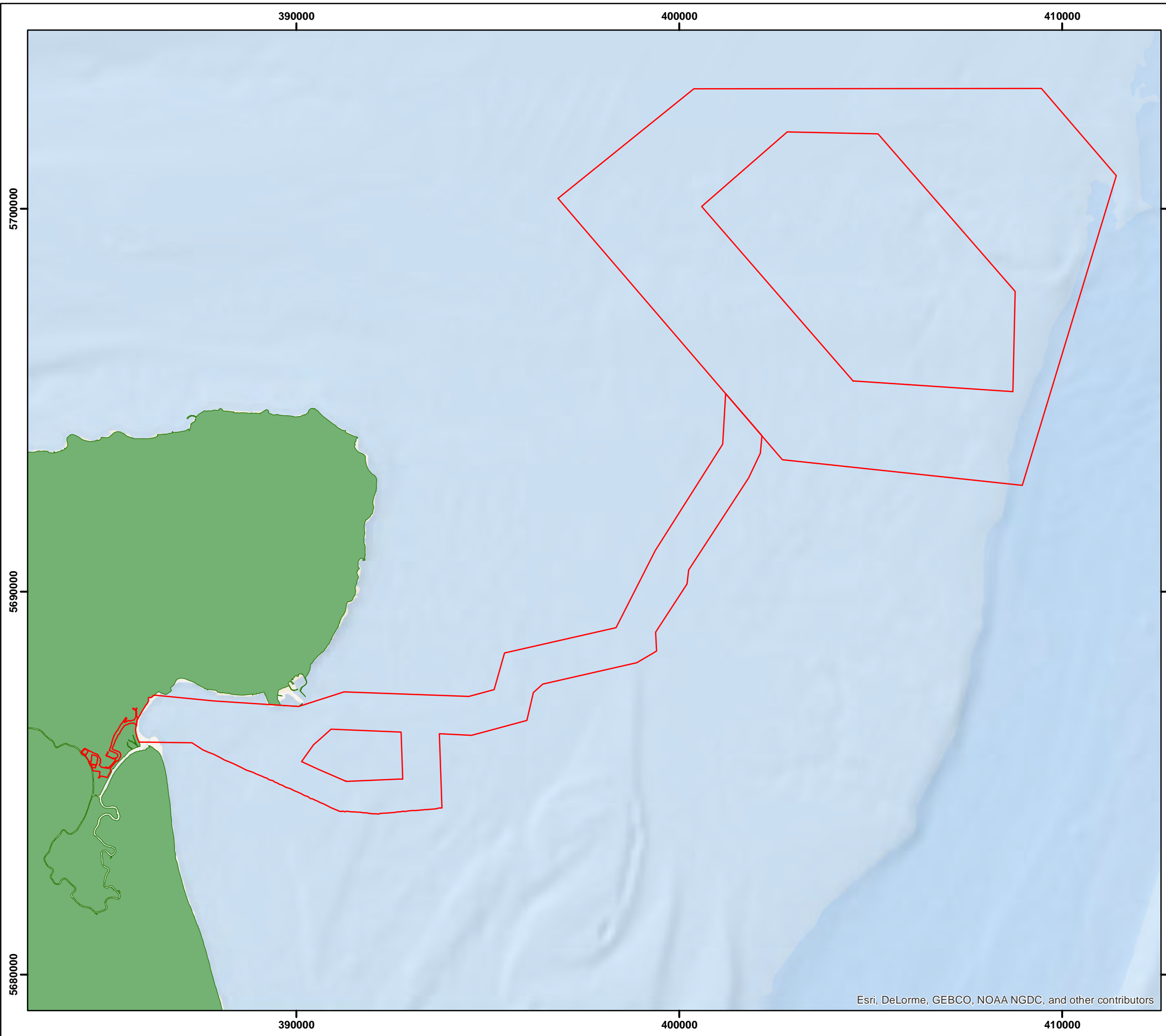
- Screening;
 - Appropriate Assessment;
 - Mitigation and alternatives; and
 - Imperative Reasons of Overriding Public Interest (IROPI).
- 1.2.4 This report comprises the Screening Stage, where the identification of LSE is reported. LSE is, in this context, any effect that may be reasonably predicted as a consequence of a project that may affect the conservation objectives of the features for which the European Site was designated, but excluding trivial or inconsequential effects.
- 1.2.5 The assessment provided in this document is based on the current understanding of the baseline environment and the scope and nature of the proposed project activities. Consultation on the Screening Report has been managed through the Evidence Plan Process, as agreed with statutory bodies through the Evidence Plan Terms of Reference (Renewables Consulting Group, 2017). This HRA Screening Report is based on the project and site specific information currently available. It should be noted, however, that further environmental survey and assessment work, consultee and advisor responses to this document, as well as refinements to the project design may change this assessment. These changes will be recorded and reflected in the full Report to Inform Appropriate Assessment (RIAA) to be submitted with the Development Consent Order (DCO) application for Thanet Extension.

1.3 Outline of the Structure and Contents of this Report

1.3.1 This document is set out in a number of stages that mirror the HRA process. These stages, and the overall structure of the document, are summarised below in Table 1.1.


Table 1.1: Document structure

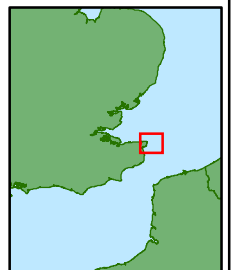
Section	Heading	Overview
1	Introduction	Provides an overview of the project and the purpose of the Screening Report.
2	Proposed Development	Provides information about the project background and the developer.
3	The HRA Process	Outlines the steps involved in the wider HRA process, and where this report sits within that process, as well as the legislative context.
4	Project Description	An overview of the key project parameters and a description of the project design. Also, provides a description of the likely construction methods.
5	Construction Programme	A brief outline of the anticipated construction schedule.
6	Environmental Baseline	Descriptions of the baseline environmental conditions for key environmental receptors.
7	Screening	Identification of sites and features that have been screened in or out (with justification) of further investigation for potential Likely Significant Effects (LSE).
8	Screening Assessment for Potential Likely Significant Effects	An assessment of the potential for LSEs to arise with regard to the designated features of the European sites under consideration.
9	In-combination Assessment	Provides an assessment of whether there are any LSEs on European or Ramsar sites when considered in-combination with other plans or projects.



**THANET EXTENSION
OFFSHORE WIND FARM**

Figure 1-1: Location map of the Thanet Extension Offshore Wind Farm

Legend
 Proposed Site Boundary



Projection: ETRS 1989 UTM Zone 31N

ESRI Basemaps

N

0 1 2 Km 0 0.6 1.2 NM

Scale: 1:100,000

Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

Rev	0.1	By	PN	Date	8/15/2017
Drg No	0083_TEOW_Figure1-1_Location_Map_v4				

2 Proposed Thanet Extension Offshore Wind Farm

2.1 Introduction to Thanet Extension

2.1.1 VWPL is proposing the development of the Thanet Extension Offshore Wind Farm (Thanet Extension). The project will be located approximately 8 km offshore from the Kent coastline (at its closest point), in proximity to the operational TOWF. It would have a generation capacity of up to 340 MW. Up to 34 wind turbine generators (WTGs) would be located in the array, an area approximately 70 km² in size. Electricity generated would be transported to the shore by offshore export cables installed within the proposed offshore export cable corridor to the landfall at Pegwell Bay, then through buried export cables installed within the proposed onshore cable corridor to an onshore substation at Richborough, which will in turn connect to the existing National Grid substation.

2.1.2 A detailed project description can be found in Volume 2 Chapter 1 and Volume 3 Chapter 1 (Offshore and Onshore Project Description, respectively), however the key offshore components include:

- Wind turbine generators (WTGs) and their associated foundations;
- Offshore substation and associated infrastructure (if required);
- Inter-array subsea cables between the WTGs;
- Subsea export cables between the WTGs and the shore;
- Mattresses or other protective materials associated with cable crossings (if required) and;
- Scour protection around foundations and over array and export cables (if required).

2.1.3 The key onshore components of the development are likely to comprise the following:

- Landfall site with associated transition bays to connect the offshore and onshore cables;
- Onshore underground cables with jointing bays situated at intervals along the onshore cable route as necessary;
- Temporary construction areas; and
- Onshore substation in proximity to the grid connection location at Richborough.

2.2 Project Background

2.2.1 The TOWF has been operational since 2010, having been acquired by Vattenfall prior to construction in 2008. The site comprises 100 Vestas V90 3.0 MW WTGs and is situated approximately 11 km off the east coast of Kent. In 2009, The Crown Estate (TCE) offered Vattenfall the right to extend Kentish Flats Offshore Wind Farm (OWF) and TOWF, however, only Kentish Flats Extension (KFE) OWF was taken forward at that point. In

2014, following a wider review of Vattenfall's offshore wind strategy and whilst KFE was under construction, the possibility of extending TOWF was revisited.

2.2.2 In early 2015, Vattenfall undertook some initial desk based feasibility work and constraints mapping using existing data and site knowledge, the results of this exercise were used to delineate a preliminary OWF site boundary and offshore cable corridor Area of Interest. The emphasis at this stage was to determine whether the project was likely to be economically viable, technically feasible and environmentally acceptable.

2.2.3 In late 2015, following a favourable outcome to early analyses, Vattenfall took the decision to proceed with early development activity for Thanet Extension, namely; offshore site characterisation surveys, progressing a grid connection, further cable routing work and initiation of informal engagement with key stakeholders to gain their feedback on the early design.

2.3 Vattenfall Wind Power Ltd

2.3.1 VWPL is a fully owned subsidiary of Vattenfall Vindkraft AB. Vattenfall AB (Vattenfall) is a Swedish state-owned utility company and one of Europe's largest generators of electricity and heat. Vattenfall is also one of the world's largest developers of offshore wind power projects. Vattenfall's purpose is to power climate smarter living and the company is strongly committed to significant growth in wind, both onshore and offshore. Vattenfall has invested over £3bn in the UK, mainly in onshore and offshore wind since 2008, and will have nearly 1 GW in operation onshore and offshore by 2017. Vattenfall plans to invest €5bn in renewables, mainly offshore wind, in Northern Europe by 2020 with an overall ambition to have 4 GW of operational capacity by 2020 and 7 GW by 2025. The company has the ambition that the UK will continue to be a growth market for Vattenfall.

2.3.2 Vattenfall has world leading experience in offshore wind as owner of Kentish Flats, KFE, Ormonde, and Thanet OWFs, which are currently operational in the UK. The Vattenfall owned Aberdeen OWF is currently in construction. Vattenfall has started developing plans for the northern half of the former East Anglia Round 3 zone, which was split into two proposed offshore wind projects, Norfolk Vanguard and Norfolk Boreas respectively. Norfolk Vanguard has received a Scoping Opinion from PINS, and a second project, Norfolk Boreas is in the early stages of development.

2.3.3 Vattenfall is also developing a number of European OWFs, including recently announced successes in securing Danish competitive tender projects, Kriegers Flak, and Danish Nearshore (a total of 950 MW), and is emerging as a global leader in delivering offshore wind cost reductions. In addition, Vattenfall has recently undertaken the world's first decommissioning of an OWF, Yttre Stengrund in Kalmar Sound, Sweden.

3 The HRA Process

3.1 Legislative Context

- 3.1.1 The Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora, protects habitats and species of European nature conservation importance. Together with the Council Directive (2009/147/EC) on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive establishes a network of internationally important sites, designated for their ecological status. SACs are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. SPAs are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites, which are hereafter referred to as 'European sites'.
- 3.1.2 Terrestrial areas of the UK, and territorial waters out to 12 nautical miles (nm), are covered under The Conservation of Habitats and Species Regulations 2010 (herein referred to as the Habitats Regulations) which transposes the European legislation into UK legislation. The Habitats Regulations incorporate all SPAs into the definition of 'European sites' and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.
- 3.1.3 The Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (the Offshore Habitats Regulations) transpose the Habitats and Birds Directives into national law, covering waters beyond 12 nm, to the extent of the British Fishery Limits and UK Continental Shelf Designated Area. The Offshore Habitats Regulations came into force on 21st August 2007.
- 3.1.4 In addition, UK Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them. The Government also affords the same level of protection to potential SPAs (pSPAs) and candidate SACs (cSACs).
- 3.1.5 Under the Habitats Regulations and the Offshore Habitats Regulations, before granting approval (i.e. planning permissions, licences and consents) for a development likely to have a significant effect on an SAC or SPA/ Ramsar site, an AA must be made by a Competent Authority of its implications for the site in view of that site's conservation objectives.

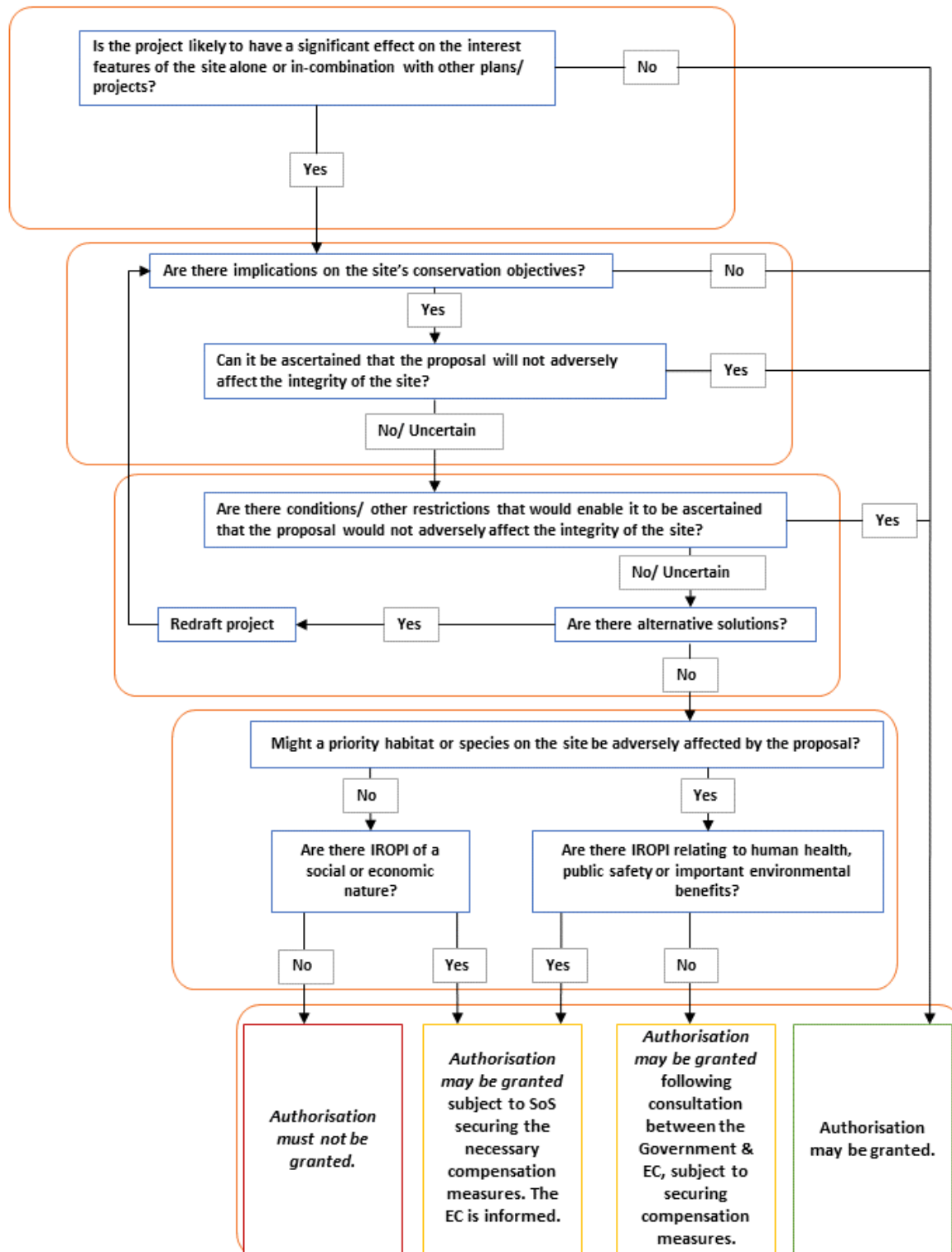
3.2 The Habitats Regulations Process

- 3.2.1 The Habitats Regulations require that whenever a project that is not directly connected to, or necessary for the management of a Natura 2000 site and is likely to have a significant effect on the conservation objectives of the site (directly, indirectly, alone or in-combination with other plans or projects), then 'Appropriate Assessment' (AA) must

be undertaken by the Competent Authority (Regulation 61 of the Habitats Regulations). The AA must be carried out before consent or authorisation can be given for the project.

- 3.2.2 The Planning Inspectorate (PINS) Advice note ten 'Habitat Regulations Assessment relevant to national significant infrastructure projects' (version 7, January 2016), defines HRA as a step by step process which determines likely significant effects (LSE) and (where appropriate) assesses adverse impacts on the integrity of a European site, examines alternative solutions, and provides justification of IROPI. This constitutes a four stage process as summarised below and illustrated in Figure 3.1.
- HRA Stage 1 – Screening: Screening for LSE (alone or in-combination with other projects or plans);
 - HRA Stage 2 – Appropriate Assessment: Assessment of implications of identified LSEs on the conservation objectives of a European site to ascertain if the proposal will adversely affect the integrity of a European site.
 - HRA Stage 3 – Assessment of Alternatives: Where it cannot be ascertained that the proposal will not adversely affect the integrity of a European site, alternative solutions must be considered; and
 - HRA Stage 4 – Assessment of IROPI: Where no alternatives are identified.
- 3.2.3 All four stages of the process are referred to as the Habitats Regulations Assessment (HRA) to clearly distinguish the whole process from the one step within it referred to as the 'Appropriate Assessment' (AA).
- 3.2.4 The integrity of a site is defined as the coherence of the site's main ecological structure and function across the whole of its area, which enables it to sustain the habitat, complex of habitats and/ or populations of species for which the site has been designated (EC, 2001). An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status as it did at the time of designation.

Figure 3.1: Four stage HRA process (adapted from The Planning Inspectorate, 2016)



3.3 Roles and Responsibilities

- 3.3.1 The National Infrastructure Directorate within PINS (hereafter known as ‘the Examining Authority’) is the body responsible for examining applications for development consent under the Planning Act 2008. The Examining Authority will not make the final decision on Thanet Extension; this decision will fall to the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS) (hereafter referred to as the SoS).
- 3.3.2 This Screening Report and the RIAA to follow, produced for Thanet Extension, will provide the information required by the Competent Authority to enable it to undertake an AA, if required, in accordance with Article 6(3) of the Habitats Directive.

3.4 Approach to Screening

- 3.4.1 Screening is a relatively coarse filter to identify those sites and features for which a LSE cannot be discounted. Once a site/ feature is identified, the Screening exercise considers whether or not a significant effect can be foreseen, both directly and indirectly. Where it is not possible to exclude an LSE, then the site/ feature is progressed to the AA Stage (Stage 2 of the HRA).
- 3.4.2 In relation to each European site considered in the Screening exercise, at Stage 1 of the HRA (Screening), it will be concluded that either:
- There are no LSEs on the European site(s) and therefore no further assessment is required; or
 - LSEs on the European site(s) cannot be discounted and these require an AA by the Competent Authority.
- 3.4.3 With respect to in-combination effects, this Screening report identifies the categories of plans and projects that will need to be considered, but recognises that further discussion

with local authorities and Statutory Nature Conservation Bodies (SNCBs) will be required to identify specific projects for inclusion in the in-combination assessment. The RIAA will include, for those sites screened into assessment, a detailed in-combination assessment drawing on the environmental impact assessments (including cumulative assessment) undertaken specifically for Thanet Extension to understand the magnitude of those effects and whether they may lead to an adverse effect on site integrity.

3.5 Consultation

- 3.5.1 Initial discussions regarding Thanet Extension, including the HRA Screening Report, have been held through the Evidence Plan process, with meetings held in London for onshore on 11th July 2017 and offshore on 12th July 2017. In addition, consultees were provided with a copy of the draft Screening Report on 15th June 2017, with the report re-issued on 4th July 2017 to MMO. Comments were requested by 28th July 2017. Consultees were as follows:

- Natural England;
- RSPB;
- Kent County Council;
- Kent and Essex IFCA;
- Environment Agency;
- Historic England;
- MMO; and
- Thanet District Council.

- 3.5.2 A summary of the comments received, together with where/ how they have been addressed within this revised Screening Report, is provided in Table 3.1 below.

Table 3.1: Summary of Consultation undertaken on the draft Screening Report

Consultee	Reference	Comment	Addressed
Natural England	Letter issued by email dated 31 st July 2017, ref 10413 Consultation 221137	Content with the HRA Screening report for marine mammals. Note that the SNS cSAC is included, Wash and Humber SACs for seals are screened out and transboundary sites considered (some screened in).	Noted
		Note that the in-combination assessment will be complex and will be presented in the RIAA.	Noted
Natural England	Letter issued by email dated 26 th July 2017, ref 10413 Consultation 221137	Determination of LSE requires revisiting to ensure accuracy. Natural England (NE) is content with the LSE determination on benthic and physical processes but the text and detail requires updating.	Determination of LSE re-visited, with minor changes made
		Would be helpful to present the alternatives considered and why they aren't commercially/ environmentally viable.	Project Description presented in Section 4 Detail on Site Selection and Alternatives (on which the Project Description is based) is presented in Volume 1 Chapter 4 of the PEI
		Need to include the impact of TOWF cable replacement for the in-combination assessment.	Project will be included in the assessment
		Temporal <i>S. spinulosa</i> data comparison Fig 6.1 - would be helpful to have the latest 2016 survey data included for comparison, depicting the latest 3 areas of <i>Sabellaria</i> reef reported (6.1.5).	Paragraph 6.1.6 has been updated, drawing on PEI Benthic Ecology Chapter to confirm that 2 locations in the array area were identified as potential reef, the assessment confirming one not to be reef, the other having low potential for reef. The RIAA will draw on the ES Benthic Ecology Chapter for further detail on <i>S. spinulosa</i> reef as required
		Refer to latest advice forwarded on core reef approach (email sent 24 th April 2017).	Advice will be drawn on for the RIAA as required
		Temp habitat loss & disturbance - Thanet Coast SAC. Reefs (table 8.1) and p8-45 - talks about micro-siting foundations but cable corridor overlaps with site and not array.	Text amended

	Temp habitat loss & disturbance - Thanet Coast SAC. Needs to mention cables not just array.	Text amended
	Temp habitat loss & disturbance - Margate & Long Sands SCI. Not correct that there is array overlap.	Text amended – revised to conclude no LSE
	Temp habitat loss & disturbance - Margate & Long Sands SCI. Stated that Annex I sandbanks will be micrositied where possible overlap - from figure 7.4 overlap doesn't look likely.	Text amended – revised to conclude no LSE
	Temp habitat loss & disturbance - Margate & Long Sands SCI. It would be impacts of changes to physical processes/ suspended sediment that would impact the site, not the array.	Text amended
	Temp habitat loss & disturbance - Margate & Long Sands SCI. No overlap of structure with Margate and Long Sands?	Text amended
	Suspended sediment p8-53 and 8.58. Suspended sediment during maintenance - needs to take account of cable repairs if needed and should be screened in for Thanet Coast SAC and Sandwich Bay SAC.	Text amended
	Suspended sediment p8-53 and 8.58. Suspended sediment during maintenance. Further justification with regards to pathways and distances is required to screen suspended sediment during operation out for Margate and Long Sands.	Text amended and site screened in
	Refers to advice on operations. For relevant sites, there is a list indicating which pressures may be exerted by relevant operations.	Explanatory text added in Table 7.2
	General comment - LSE Table direct disturbance and displacement (p 51&59). Can Vattenfall clarify that the potential impact of direct disturbance and displacement is not duplicating impacts under noise and visual disturbance.	The effects were considered separately to manage potential effects onshore and offshore – note added to highlight where the effect has been considered
	General comment - accidental pollution - acknowledge that a CoCP and EPMP will be agreed with the aim to avoid impacts through accidental pollution. However, given the early stage of the process, we are unable to agree that there will be no LSE until these documents have been agreed between relevant parties.	Text amended – potential LSE concluded from sites in closest proximity
	Cumulative impacts - to include the potential remedial TOWF cable works.	Project will be included in the assessment

	Would welcome the opportunity to receive updated documents ahead of PEIR, provided sufficient time is allowed.	Screening Report to be re-issued prior to the Evidence Plan meeting in September 2017
	Wintering golden plover (section 6.5.6): Please note that the survey report by Griffiths (2003) on the numbers and distribution of wintering golden plover has recently been updated following new survey work commissioned by NE. A copy of the new report is attached for your information.	Reference added and incorporated into baseline (here and in PEIR)
	Anticipated effects from Thanet Extension on relevant receptors (table 7.3):1. For both Construction and Operation the current table doesn't clearly differentiate between the loss/ degradation of habitats where these are a designated site interest feature in their own right and where such loss/ degradation would have an indirect, detrimental effect on species interest features.	Tables 7.4 and 8.1 amended
	Table 3.9 of the Scoping Report summarised onshore ecology construction impacts to be scoped in, there are two potential topics not picked up in this HRA Screening Report: temporary habitat fragmentation and species isolation and spread of non-native, invasive species.	Tables 7.3 and 8.1 amended to include
	Under the potential effect of 'Habitat loss' in operation we would query why impacts on both designated sites and functionally connected habitats are flagged under construction and then only functionally connected habitats are referred to as being potentially affected by operational maintenance. Surely if designated sites can be affected by construction works they can also be affected by future maintenance works once the project is operational?	Table 7.4 amended to clarify, Note this section deals with effects solely associated with operation (habitat loss during construction has already occurred)
	We agree with the assumption that impacts to onshore ecology during the decommissioning phase will be similar to those during construction.	Noted
	Table 7.4: We would draw your attention to the cut-and-paste error in this table whereby the designated features for the Sandwich Bay SAC have also been included in error for the Thanet Coast SAC.	Text amended
	Table 8.1 determination of LSE – text and detail needs checking and updating.	Text amended
	Temporary habitat loss and disturbance to Sandwich Bay SAC during construction – given that all relevant features occur above high water the reference to potential damage from anchors is presumably an error?	Text amended

	<p>Temporary increases in suspended sediment concentrations, deposition of sediments and smothering to Sandwich Bay SAC – given that all relevant features occur above high water we would query the likelihood of a significant effect on this SAC through this pathway of impact.</p>	Text amended
	<p>Temporary habitat disturbance to Sandwich Bay SAC – references to micro-siting of foundations and anchor damage do not appear relevant for this terrestrial SAC.</p>	Text amended
	<p>NE agree that Vattenfall have considered breeding little tern within Thanet Coast SPA sufficiently. Although this species is still considered an interest feature of the designated site, given that this species has not bred at this site for a number of years we agree that Vattenfall have done all they can and considered this species fully before scoping it out.</p>	Noted
	<p>We suggest that the ‘Potential range of effect’ in Table 7.2 is amended to >10km, and reflected in the actual HRA.</p>	Amended to 6.5 km to reflect the distance at which a level of displacement significantly greater than zero for red-throated diver could be detected being during the monitoring of the construction phase of the nearby London Array OWF (APEM, 2016). Footnote provided to this effect.
	<p>7.4.9 states that collision risk modelling (CRM) has not yet been carried out – although we understood that CRM had been carried out on the data collected so far using Masden (2015) so perhaps this could be clarified.</p>	Text amended
	<p>We agree that it is appropriate to screen in any species that are known to fly at collision risk height, i.e. gannet, kittiwake and large gull species.</p>	Noted
	<p>Table 8.1 under collision risk suggests waiting for the CRM results before determining LSE. However, NE would advise potential LSE even before carrying out CRM, particularly when considering in-combination. Section 9.1.4. states that criteria for screening in is the potential for a cumulative impact to occur - this is the case for both kittiwake and gannet.</p>	Text revised to accept the screening for LSE can initially be carried out on an experience basis and then it can be refined using the quantitative CRM results when MExcel Band CRM is run
	<p>On page 8-60 it states ‘No LSE’ to Kittiwake from Flamborough Head and Bempton Cliffs SPA. We we assume that this is be a typing/ formatting error but needs to be clarified.</p>	Formatting error – table corrected

		Table 8.1 states No LSE on little tern from Thanet Coast and Sandwich Bay SPA. Whilst we acknowledge no breeding little tern at present it is still a notified feature and may return to breed in the future. However, we agree that this feature is screened out on the basis that even if breeding birds were present, their mean max foraging range would mean it is unlikely to interact with the array. Therefore we suggest that the reason for screening out this receptor is expanded.	Text amended
MMO	Letter by email dated 26 th July 2017, Ref DCO/2016/00003	MMO Defers to NE on marine mammals.	Noted
		MMO Defers to NE on ornithology.	Noted
		Considers the data gathering appropriate for fish ecology.	Noted
		Notes that relevant effects have been screened in for diadromous fish but not discussed in detail. These effects will be relevant in the EIA and it is expected that detailed assessment will be presented there.	Noted – additional text added in Section 6 to highlight.
		MMO agrees that the impacts of temporary habitat loss and disturbance, temporary increases in suspended sediment concentrations, deposition of sediments and smothering and increase in underwater noise, the LSE for diadromous fish is negligible.	Noted
		MMO agrees with the conclusion of the screening effects and expects further detailed assessment to marine fish in the EIA.	Noted
		MMO agrees that all relevant benthic ecology impacts have been adequately screened in, data gathering assessment is appropriate.	Noted
		Page 8-45 Table 8.1 under temporary habitat loss and disturbance during construction (text under consideration of LSE for each of the three SACs) states that foundations will be micro-sited to avoid features present. However, the WTG foundations are not being placed within the inshore SACs under assessment. These paragraphs should be amended to be specific to cable laying and the micrositing of the cable route to avoid relevant features.	Text amended
		Page 8-52 table 8.1 long term physical loss of habitat. The SNS cSAC is not included despite the justification section containing the text offshore, the footprint/ presence of structures etc. The MMO acknowledges that the SAC has been included under 'change in prey availability and behaviour section' but suggests it also needs to be included in the long term physical loss section	Consideration of LSE added, with a conclusion of no LSE

		MMO agrees with the conclusions of LSE for benthic ecology once the report clarifies the comments.	Noted
RSPB	Email dated 02.08.17	At this stage happy with the report.	Noted

4 Project Description

4.1.1 The full project description information is provided within the Preliminary Environmental Report (PEIR), specifically within Volume 2, Chapter 1: Project Description (Offshore) and Volume 3, Chapter 1: Project Description (Onshore). Individual PEIR chapters present the design envelope scenario relevant to each receptor – effectively identifying the maximum adverse scenario that could result from the overall Project Description, as it applies to each receptor.

4.1.2 A summary of the project description is provided here, to provide a broad overview of the project (drawing on the Volume 2, Chapter 1: Project Description (Offshore) and Volume 3, Chapter 1: Project Description (Onshore). Should further changes be made to the project description between issue of the Screening Report and finalisation of the RIAA, these will be logged and addressed within the RIAA.

4.1 Project Overview

4.1.1 Thanet Extension will comprise of WTGs and all infrastructure required to transmit the power generated by the WTGs to the national grid network via the grid connection location at Richborough. It will also comprise any onshore and offshore infrastructure required to operate and maintain the wind farm and associate infrastructure.

4.1.2 Thanet Extension will have a maximum of 34 WTGs, which will supply up to 340 MW of power. The project will also have up to four offshore export cables and may or may not include up to one offshore substation (OSS) as part of the power transmission system. The onshore export cables will be buried for the entirety of the onshore export cable route.

4.1.3 The key components of Thanet Extension are likely to include:

- Offshore wind turbine generators (WTGs);
- OSS (if required);
- Foundations (for WTGs, and OSS if required);
- Subsea inter-array cables linking the individual wind WTGs;
- Subsea export cables from the wind farm to shore;
- Scour protection around foundations and on inter-array and export cables (if required);
- Four Transition Joint Bays (TJBs);
- Four onshore export cable circuits (up to 132 kV); and
- One onshore substation including onshore Horizontal Directional Drilling (HDD) infrastructure from substation to National Grid, comprising of four ducts (one per cable circuit).

4.1.4 The general wind farm site information is shown in Table 4-1 below.

Table 4-1 Basic site information

Parameter	Maximum design envelope
Total site area (array) (km ²)	35
Total offshore export cable corridor area (km ²)	28
Shortest distance from array area to shore (km)	8
Site capacity (MW)	340
Number of WTGs	34
Number of offshore substations	1
Onshore cable corridor (approximate length (km))	2

4.2 Design Envelope Scenario Assessed

4.2.1 The design envelope scenario to be assessed per receptor group are presented within the relevant PEIR Chapters, as follows:

- Volume 2: Chapter 4: Offshore Ornithology, Table 4.8;
- Volume 2: Chapter 5: Subtidal and Intertidal Benthic Ecology, Table 4.10 ;
- Volume 2: Chapter 6: Fish and Shellfish Ecology, Table 6.7;
- Volume 2: Chapter 7: Marine Mammal Ecology, Table 7.14; and
- Volume 3: Chapter 5: Onshore Biodiversity, Table 5.7.

4.2.2 The relevant design envelope scenario for each receptor will be summarised and presented within the RIAA.

5 Construction Programme

- 5.1.1 The onshore construction is currently anticipated to commence in Q4 of 2020, with the offshore construction commencing in Q1 2021. It is anticipated that commissioning will be completed by Q4 2021. The grid connection date is still to be confirmed. It is projected that Thanet Extension will operate for 25 years.
- 5.1.2 In terms of decommissioning the worst case is considered to be a reversal of the construction effects (both in duration and magnitude) as this represents the likely greatest scale of effect. The need or otherwise for removal of infrastructure will be discussed in consultation with the relevant authorities at that time per the sensitivities of the site. There will be no piling during decommissioning. The implications of any noise associated with the decommissioning phase will be considered in line with the decommissioning plan at the time of decommissioning. Due to uncertainty in the methods that may be employed at that time, for the purposes of this assessment it is assumed that the noise will be no greater than that associated with the installation.

6 Environmental Baseline

6.1 Project Level Information

6.1.1 This Section has primarily drawn on site specific studies completed as part of the existing TOWF, together with the Scoping Report produced for Thanet Extension. Additional information (where available) has been used to inform the environmental baseline from the studies being undertaken to inform Thanet Extension; as further information becomes available; the baseline description will be updated for the RIAA.

6.1.2 It should be noted that the PEIR (and subsequent ES) will provide further detail on the existing environmental baseline within the relevant chapters, together with impact assessment as appropriate. Where additional information is sourced, the information provided here will be updated for the RIAA. Relevant chapters are as follows:

- Subtidal and intertidal benthic habitats (PEIR Volume 2 Chapter 5, ES Volume 2 Chapter 4);
- Fish ecology; (PEIR Volume 2 Chapter 6, ES Volume 2 Chapter 5);
- Marine mammals (PEIR Volume 2 Chapter 7, ES Volume 2 Chapter 6);
- Offshore ornithology (Volume 2 Chapter 4, ES Volume 2 Chapter 3); and
- Onshore ecology (PEIR Volume 3, Chapter 5, ES Volume 3 Chapter 4).

6.2 Subtidal and intertidal benthic habitats

6.2.1 The Scoping Report for Thanet Extension highlighted that the intertidal area of Pegwell Bay is characterised by muddy sand flats dominated by the polychaete worms *Lanice conchilega* and *Arenicola marina*, and also supports populations of bivalve molluscs such as edible cockle *Cerastoderma edule* and Baltic tellin *Macoma balthica*. The foreshore comprises a length of wavecut chalk platform, fronting the chalk cliffs between Ramsgate and Cliffs End, and areas of *Spartina* saltmarsh either side of the disused hoverport. At Sandwich Bay, the intertidal area is characterised by mudflats which are exposed at low tide along the foreshore and overlain with a shingle beach backshore. The shingle beach is recorded as supporting vegetated shingle habitat.

6.2.2 Environmental characterisation surveys for the TOWF were undertaken in 2005 and 2007 to inform baseline, for micro-siting of the WTGs and cables and to prevent damage to reef habitat, with further work undertaken post-construction. Specific to Thanet Extension, the offshore benthic environment was surveyed in 2016 by Fugro (Fugro Survey B.V, 2016). The survey comprised sediment sampling for chemistry analysis (22 stations), sediment PSD (28 stations) and macrofauna (26 stations), along with 39 stations where drop down video (DDV) footage was taken of the seabed. A summary of the findings is provided below.

TOWF Survey Results

6.2.3 The sediments within TOWF comprise a mixture of coarse sands, fine sands and cobbles, with bedrock outcrop within the central-southern portion of the site. The organic content of these sediments varied between <0.20% and 1.50%, representing low to moderate levels (MESL, 2013). Post-construction surveys demonstrated no overall significant difference in the particle size distribution (PSD) in the samples pre- and post-construction of TOWF (TOWL, 2013a).

6.2.4 A wide range of benthic invertebrate species have been recorded during the surveys, particularly annelids but also crustaceans, molluscs and echinoderms. The TOWF surveys revealed considerable variation in abundance and diversity between sample locations, although infaunal biomass was relatively uniform. The TOWF surveys recorded some 264 species, with post construction monitoring identifying four infaunal communities. The most abundant epifaunal species were the long clawed porcelain crab *Pisidia longicornis* and *Sabellaria spinulosa*.

6.2.5 During post construction surveys (2012) of TOWF revealed a wider distribution of *S. spinulosa* which was categorised as moderate (patchy) growth and dense growth as compared to the earlier surveys (2005 & 2007). It was assumed that the positive growth and stable *S. spinulosa* may be partially attributed to the reduction of destructive bottom fishing activities as a result of the presence of the TOWF and the associated cable infrastructure (MESL, 2013). The differences in the surveyed *S. spinulosa* are presented in Figure 6.1. Furthermore, there has been no reported evidence of damage to the *S. spinulosa* resulting from the construction and operation of TOWF.

Thanet Extension Surveys

6.2.6 During the DDV surveys, undertaken in 2016 for Thanet Extension, two locations within the array area were identified as having the potential to be classified as *S. spinulosa* reef. The reef assessments classified one location as low potential for being *S. spinulosa* reef, while the second location was classified as not reef.

6.2.7 Within the proposed array site and export cable corridor, the following habitats of nature conservation interest have been identified:

- Blue Mussel (*M. edulis*) Beds;
- Peat and Clay Exposures;
- Ross Worm (*S. spinulosa*) Reefs; and
- Subtidal Chalk.

6.2.8 The majority of the locations of these habitats are included within designated sites, although the nature of the *M. edulis* beds and *S. spinulosa* reefs are such that these have the potential to be present throughout the study area.

6.3 Fish Ecology

TOWF Survey Results

- 6.3.1 Fish monitoring undertaken at the existing TOWF recorded species typical of the wider area. These included numerous flatfish; particularly dab *Limanda limanda*, plaice *Pleuronectes platessa* and Dover sole *Solea solea*, and to a lesser extent, flounder *Platichthys flesus* and lemon sole *Microstomus kitt*. Round fish included whiting *Merlangius merlangus*, pouting *Trisopterus luscus*, goby spp. *Gobidae* and *Clupidae* (TOWL, 2013a). *S. solea* have known spawning and nursery grounds nearby as do herring *Clupea harengus*, which spawn within Herne Bay, to the west of the development in the spring. From discussion with the Thanet Fishermen's Association, seabass *Dicentrarchus labrax* is thought to be most prevalent in the vicinity of the Project site during the spring (Ocean Ecology, 2016).
- 6.3.2 The wider region is considered important for elasmobranch species, particularly the thornback ray *Raja clavata* which is known to have inshore nursery grounds in the region (Ellis *et al.* 2012). In addition to thornback rays, other elasmobranch species which occurred during monitoring surveys for the TOWF included the small-spotted catshark *Scyliorhinus canicula*, and to a lesser extent, the starry smoothhound *Mustelus asterias* (TOWL, 2013a).
- 6.3.3 No Annex II fish species were identified in any of the site specific surveys at the TOWF.

Thanet Extension Survey Results

- 6.3.1 The Project's Fisheries Liaison Officer (FLO) has confirmed *D. labrax* are present as well as *S. solea*, rays are significant commercial species at the Project site together with cod *Gadus morhua* and *D. labrax*. (Ocean Ecology, 2016).
- 6.3.2 Important shellfish resources across the region are also known to include lobster *Homarus gammarus*, edible crab *Cancer pagurus*, brown shrimp *Crangon crangon*, king scallop *Pecten maximus* and queen scallop *Aequipecten opercularis*. There are also significant fisheries in the area targeting the common whelk *Buccinum undatum* and more recently along the ECC, blue mussel *Mytilus edulis* (Ocean Ecology, 2016).
- 6.3.3 Most recently, a site characterisation survey at Thanet Extension for commercial fish and epifaunal communities was undertaken in November 2016. Otter trawl and beam trawl stations were sampled which encompassed the proposed development site and the cable corridor, together with a reference area. There were no anticipated impacts from the proposed development on the reference area. The aim of these surveys was to provide high level information about commercial fish, juvenile fish and epifaunal communities within and adjacent to the proposed development. A spring survey was undertaken in April 2017.
- 6.3.4 A total of 13 species of fish (including two elasmobranch species) and four species of shellfish were recorded with the most frequently recorded fish species being the pouting

T. luscus and the most frequently recorded shellfish species being the commercially targeted common whelk *B. undatum*. Total abundance per tow was also low and largely restricted to higher numbers of the elasmobranch small-spotted catshark *S. canicula* and thornback ray *R. clavata*. The results of this survey are presented in Figure 6.2.

- 6.3.5 No Annex II fish species were identified in any of the site-specific surveys at Thanet Extension.

6.4 Marine Mammals

- 6.4.1 Several cetacean species (whale, dolphin and porpoise) occur throughout the southern North Sea; these include the harbour porpoise *Phocoena phocoena*, white-beaked dolphin *Lagenorhynchus albirostris*, bottlenose dolphin *Tursiops truncatus* and minke whale *Balaenoptera acutorostrata* (DECC, 2009; Hammond *et al.*, 2013; Reid *et al.*, 2003; SCOS, 2015; WWT, 2009). However, within UK waters species diversity and abundance of cetaceans within the southern North Sea is relatively low compared to the more northerly areas of the North Sea (Sea Watch Foundation, 2008). Harbour porpoise and white-beaked dolphin are recorded regularly throughout the year in the southern North Sea and minke whale is recorded as a frequent visitor (Reid *et al.*, 2003; Sea Watch Foundation, 2008). Bottlenose dolphin is recorded occasionally, for example in the Thames Estuary (Castello *et al.*, 2015). Several cetacean species, including Atlantic white-sided dolphin *Lagenorhynchus acutus*, short-beaked common dolphin *Delphinus delphis*, killer whale *Orcinus orca*, sperm whale *Physeter microcephalus* and long-finned pilot whale *Globicephala melas* are recorded as occasional visitors to the southern North Sea (Reid *et al.*, 2003; DECC, 2009). Other cetacean species can occur in the southern North Sea, although sightings are infrequent and rare (Reid *et al.*, 2003).
- 6.4.2 All cetaceans in UK waters are classed as European Protected Species (EPS) under Annex IV of the Habitats Directive (European Union (EU) Directive 92/43/EEC). Bottlenose dolphin and harbour porpoise are all listed under Annex II of the Habitats Directive and are afforded protection through the designation of Natura 2000 sites. The Southern North Sea site has been proposed for designation, as an SAC for, the Annex II species harbour porpoise. This site is currently designated as an cSAC and is afforded the same protection as a designated SAC.
- 6.4.3 Harbour porpoise was the only cetacean species recorded during the ornithology surveys at the TOWF site (TOWF, 2013). The marine mammal sightings survey area covered the TOWF site, plus 0-1 km buffer and 0-2 km buffer. These surveys included the pre-construction period (2004-2005), construction period (2009-2010) and post-construction period (Year 1 (2010-11); Year 2 (2011-12); and Year 3 (2012-13)) (TOWF, 2013).
- 6.4.4 The TOWF ES identified the main diet of harbour porpoise as being small fish, such as herring, sprat, sand-eel, whiting, saithe and Pollack, although potentially also dab,

TOWF Surveys

- 6.4.3 Harbour porpoise was the only cetacean species recorded during the ornithology surveys at the TOWF site (TOWF, 2013). The marine mammal sightings survey area covered the TOWF site, plus 0-1 km buffer and 0-2 km buffer. These surveys included the pre-construction period (2004-2005), construction period (2009-2010) and post-construction period (Year 1 (2010-11); Year 2 (2011-12); and Year 3 (2012-13)) (TOWF, 2013).
- 6.4.4 The TOWF ES identified the main diet of harbour porpoise as being small fish, such as herring, sprat, sand-eel, whiting, saithe and Pollack, although potentially also dab,

flounder, sole and cod. Breeding mainly occurs between May and August, but can be as early as March.

- 6.4.5 Two seal species (pinnipeds) are resident in UK waters: grey seal (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*) (SCOS, 2015). Both seal species occur in the southern North Sea and were recorded during the ornithological surveys at the TOWF site (TOWL, 2013a). Harbour seals haul out onto tidally exposed sandbanks, rocks or mud and some beaches to rest, moult and suckle their young. They also breed near to their haulout sites, but may feed at a long distance from these locations. Harbour seals are more likely to be found out of the water between June and September, during times of pupping and moulting, with grey seals hauling out on land between foraging trips and for breeding. The TOWF ES found no significant haulout sites south of Suffolk, but noted some sites around the Kent coast.

Thanet Extension Surveys

- 6.4.6 Site-specific surveys have been undertaken to characterise the marine mammal baseline environment at the Thanet Extension site. Vattenfall commissioned an initial three months of vessel surveys to collect baseline data on birds and marine mammals. These surveys were conducted between January and March 2016. Following this, it was advised that aerial surveys were conducted instead of vessel surveys. Therefore, APEM Ltd were contracted to conduct aerial surveys of the Thanet Extension and a 4 km buffer around it. These surveys were conducted monthly between March 2016 and March 2017.

- 6.4.7 During the 13 months of aerial surveys conducted across the Thanet Extension survey area, a total of 35 harbour porpoise have been identified from the still images collected by APEM Ltd. A further 163 sightings of unknown dolphin/ porpoise individuals were also recorded during these surveys. When these two datasets are combined then there is an apparent seasonal pattern to the sightings data, where individual porpoise and dolphin/ porpoise sightings are highest between February and April, and generally low throughout the summer months.
- 6.4.8 During the 13 months of aerial surveys conducted across the Thanet Extension survey area, a total of three seals have been identified from the still images collected by APEM Ltd. These seals could not be identified to species level. All sightings were in either February or March.
- 6.4.9 During an Evidence Panel meeting held in May 2017, it was agreed with stakeholders, including NE, that the marine mammal species of primary concern are harbour porpoise and harbour seals.

Figure 6.1: *Sabellaria spinulosa* Distribution: Comparison between 2007 & 2012 (Scoping report).

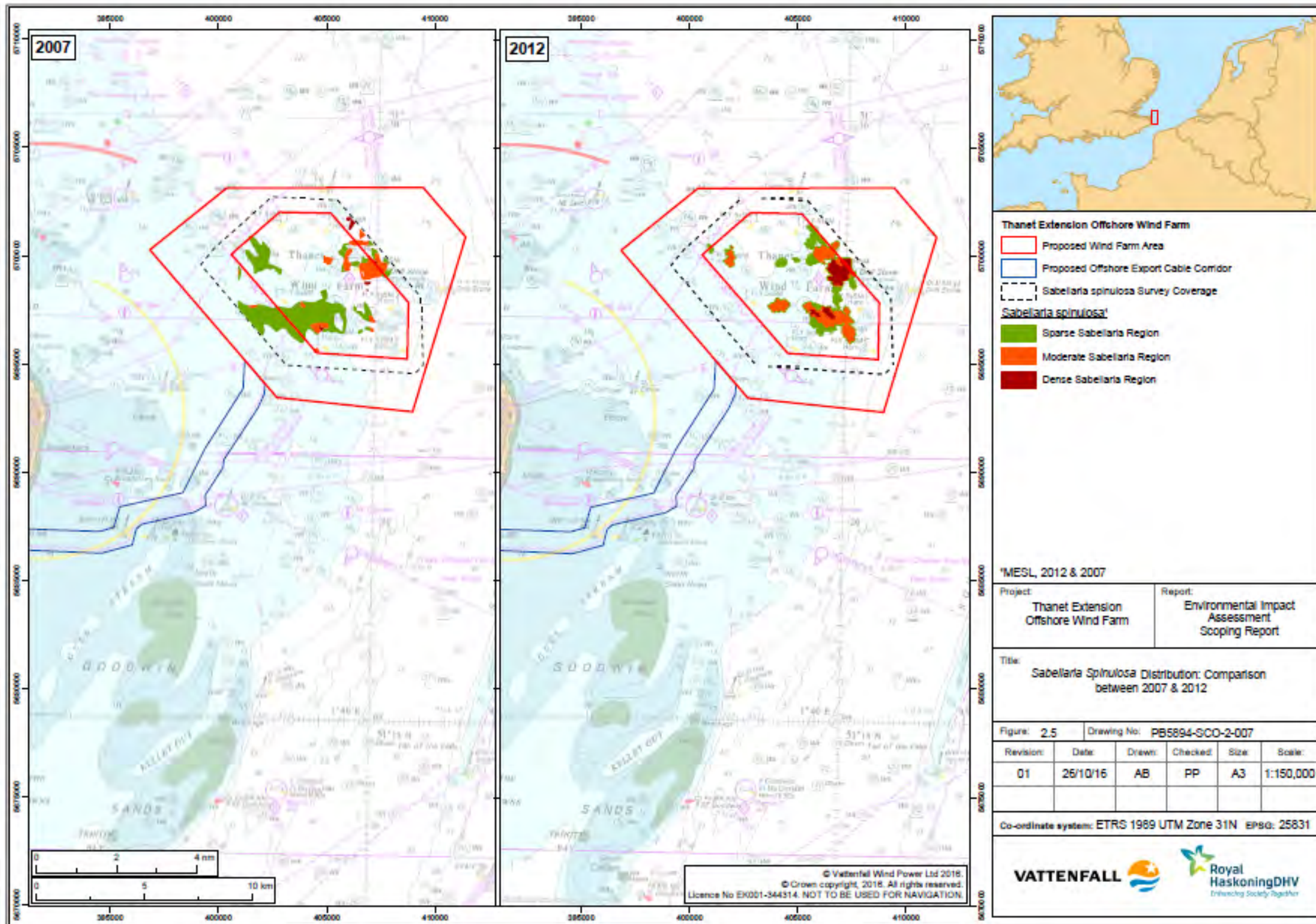
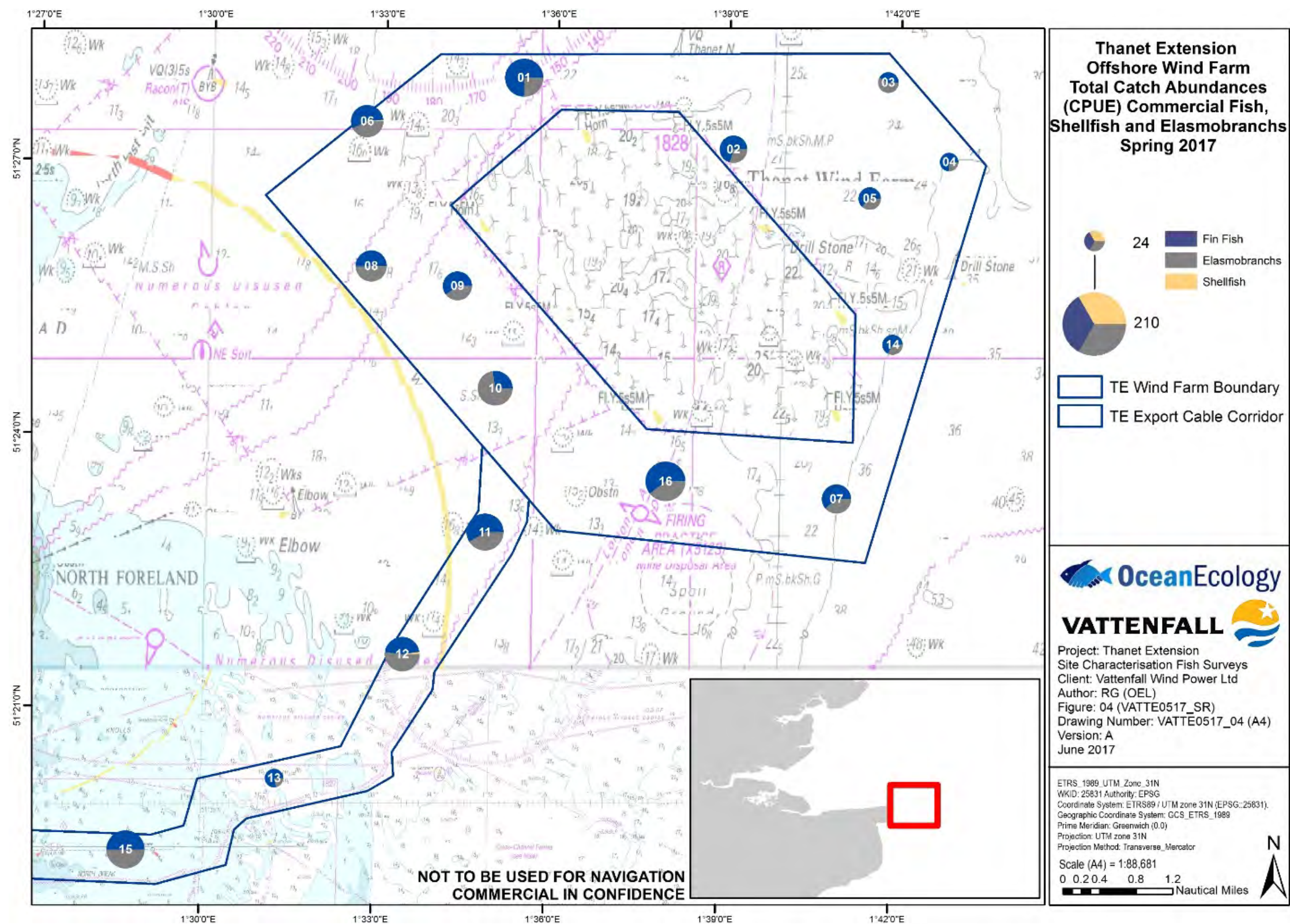


Figure 6.2: Total abundance (CPUE) of commercial fish, shellfish and elasmobranchs sampled during the November 2016. (Ocean Ecology, 2016).



6.5 Offshore Ornithology

- 6.5.1 There is a considerable amount of data available on bird activity and abundance from the area within and around the TOWF collected in the pre-application and post-consent (construction and post-construction/ operation) phases (see Table 6.1 and Percival (2015)). There has also been a programme of surveys related to the nearby Outer Thames Estuary (OTE) SPA, which is in close proximity to the Thanet Extension site. More recently, detailed studies of bird flight activity and abundance have been undertaken in TOWF, as a consequence of the Offshore Renewable Joint Industry Programme’s (ORJIP) bird collision avoidance study.
- 6.5.2 The most recent review of TOWF bird species occurrence and numbers and an evaluation of the significance of that information have been undertaken for Vattenfall (Percival, 2015). Percival (2015) reviewed the ES baseline data and post consent monitoring survey data and concluded that the primary ornithological interest was wintering red-throated diver, a qualifying feature of the OTE SPA. Percival (2015) concluded that the other species present in more than negligible numbers – gannet, guillemot, razorbill, kittiwake, herring gull, lesser black-backed and great black-backed gull – were not significant populations and that breeding seabirds were also not significant populations as there were no major colonies in proximity to TOWF.

Table 6.1: Historic and Future Offshore Ornithology Reports/ data on TOWF and Thanet Extension available for use in Thanet Extension Baseline/ EIA/ HRA

Report Date	Type	Report
November 2008	Environmental Statement	Chapter 8 Ornithology
		Appendix 8.1 Proposed Thanet Extension Aerial and Boat Based Surveys: Methodologies, results and statistical analysis (Royal HaskoningDHV)
		Appendix 8.2 Bird Collision Risk Assessment (Royal HaskoningDHV)
February 2009	Monitoring Protocol	Thanet Extension During and Post-construction Bird Monitoring Protocol (Royal HaskoningDHV)
October 2009	Annual Report (pre-construction)	Thanet Extension Annual Ornithological Monitoring Report 2009 survey season (Royal HaskoningDHV)
July 2010	Annual Report (construction)	Thanet Extension Annual Ornithological Monitoring Report (During Construction) 2009-2010 (Royal HaskoningDHV)
March 2012	Annual Report (post-construction Year 1)	Thanet Extension Ornithological Monitoring 2010-2011 (Royal HaskoningDHV)
June 2012	Annual Report (post-construction Year 2)	Thanet Extension Ornithological Monitoring 2011-2012 (Royal HaskoningDHV)
June 2013	Annual Report (post-construction Year 3)	Thanet Extension Ornithological Monitoring 2012-2013 (Royal HaskoningDHV)
January 2016	Data Report	Three months’ data from boat surveys Thanet Extension (APEM)
April 2017	Annual Report Year 1 Baseline	Thanet Extension 12-month report from Aerial Digital Surveys (APEM)
Q3/ 4 2017	ORJIP Report	First report on data gathered from TOWF study (Niras/ Vattenfall)

Other data sources to be considered

- 6.5.3 Where the information gathered by aerial digital or boat-based surveys has been supported by information from other sources, such as published literature on seabirds and the post consent monitoring reporting for TOWF, then that is identified by specific reference to that source and the full citation included in the relevant Section for the references.
- 6.5.4 In addition to the post-consent monitoring data gathered for TOWF, a UK-wide collaborative programme of environmental research (ORJIP) has been collecting and analysing data that quantifies and interprets avoidance behaviours of key seabird species within the operational TOWF site. The aim of this project is to provide data on seabirds to reduce the consenting risks for OWF projects in the UK. These data are not available at the time of preparing the baseline technical report and PEIR for Thanet Extension. Should these data be available for use within sufficient time to incorporate into the final ES Chapter then the submission of the final Development Application would include such additional site-specific data.

English southern North Sea

- 6.5.5 A considerable amount of data has been amassed on seabirds in the southern North Sea through over 450 offshore surveys, including TCE’s enabling actions surveys, SNCB monitoring programmes and individual developers baseline and /or post-consent surveys for multiple OWFs, covering a large extent of the English waters in the southern North Sea. Examination of these data, based on Percival (2015), demonstrates that the region of the North Sea within which the application area is situated is of lower ornithological interest during the breeding season than more northern areas. This is because there are very few seabird colonies in this region and therefore little dependence on these waters for foraging (Skov et al., 1995, Stone et al., 1995, Steinen et al., 2007 & Percival, 2015).
- 6.5.6 One consequence of this is that much of the focus of impact assessments, post-consent monitoring surveys and marine designations within the southern North Sea has been on seabirds in the non-breeding period. In particular, the wintering population of red-throated diver, for which the OTE SPA boundary was determined on the basis of the densities of this species during the non-breeding period (O’Brien et al., 2012). The TOWF and Thanet Extension are both outside the boundary of the OTE SPA and, as such, lie in an area within which the densities of wintering red-throated diver are relatively low and below that required for inclusion within the SPA.

Thanet Extension Survey Results

- 6.5.7 During the Thanet Extension application, specific bird surveys (see Table 6.2); 21 different species were observed. Eight species (brent goose, common scoter, cormorant, great skua, Arctic skua, little gull, Sandwich tern and ‘commic’ tern) were only recorded in the 4 km buffer on one or two occasions, shelduck was only observed on a single occasion in flight in the TOWF site and Mediterranean gull on a single occasion in the Thanet

Extension site. Summary information is provided on the remaining 11 species below (listed in bold in Table 6.2) with more detailed information in the first Annual Report on the surveys (APEM, 2017a) and in the Offshore Ornithology Baseline Technical Report (APEM, 2017b).

Table 6.2 Summary of bird occurrence in the Thanet Extension application specific bird survey area in January 2016 to March 2017

Bird species	Peak abundance estimate	Timing of peak abundance	Status
Brent goose	50	March 2016	Non-breeding
Shelduck	14	March 2016	Non-breeding
Common scoter	76	February 2017	Non-breeding
Red-throated diver	118	March 2017	Non-breeding
Fulmar	8	June 2016	Breeding
Gannet	172	March 2017	Non-breeding
Cormorant	20	March 2016	Non-breeding
Arctic skua	5	February 2016	Non-breeding
Great skua	9	January 2017	Non-breeding
Kittiwake	89	February 2017	Non-breeding
Black-headed gull	37	March 2016	Non-breeding
Little gull	7	January 2016	Non-breeding
Mediterranean gull	3	February 2016	Non-breeding
Common gull	35	March 2016	Non-breeding
Lesser black-backed gull	65	April 2016	Non-breeding (passage)
Herring gull	123	March 2016	Non-breeding
Great black-backed gull	84	January 2016	Non-breeding

Bird species	Peak abundance estimate	Timing of peak abundance	Status
Sandwich tern	10	March & April 2016	Non-breeding (passage)
'Commic' tern	19	April 2016	Non-breeding (passage)
Guillemot	278	February 2016	Non-breeding
Razorbill	113	January 2016	Non-breeding

Table note: Species in bold are those which were observed in the Thanet Extension site and the abundance estimate is for the Thanet Extension site. Other species only occurred in the TOWF site or the 4 km buffer and the abundance estimates relate to those respective areas.

6.6 Onshore Ecology

Habitats

6.6.1 A variety of habitats exist within the Thanet Extension Area of Interest, including the following UK Habitats of Principal Importance; coastal saltmarsh, lowland fen, reedbed, coastal and floodplain grazing marsh, coastal sand dunes, coastal vegetated shingle, mudflat, deciduous woodland and good quality semi-improved grassland.

6.6.2 The Extended Phase 1 Habitat survey originally undertaken in 2005 as ecological survey data collected for the TOWF Environment Statement identified a number of key habitat components within the study area, which extended for 1 km either side of the onshore cable route. The key habitat types present within the onshore site and surrounding land included:

- Saltmarsh across Pegwell Bay;
- Semi-improved grassland;
- Rough grassland;
- Amenity grassland;
- Arable;
- Open water;
- Reedbed;
- Broadleaf woodland;
- Broadleaf plantation;
- Individual trees; and
- Dense scrub.

6.6.3 Some of these habitats are qualifying features of Thanet Coast & Sandwich Bay SAC and others provide functionally linked habitats for Thanet Coast & Sandwich Bay SPA/ Ramsar qualifying features, especially wintering turnstone, golden plover and potentially a range of Red Data Book wetland invertebrates. Qualifying features are presented in Table 7.5 and Table 7.8.

6.6.4 Priority habitats for the study area are presented in Figure 6.4.

Literature Review

6.6.5 Buffer areas were used to screen in potential sites based on 10 km (SACs) and 20 km (SPAs) of the Order Limits. These distances have been utilised based on the following guidance:

- NE (2010) - Technical Information Note TIN069
- SNH (March 2012) - Guidance Assessing Connectivity with Special Protection Areas (SPAs)
- SNH (May 2014) - Guidance Recommended bird survey methods to inform impact assessment of onshore wind farms
- SNH (2016) - Guidance Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds

6.6.6 A literature search and review was carried out in order to obtain contextual data and to gain further information on all European sites within 10 km of the Order Limits and their qualifying interests (plus European sites with 20 km with mobile bird qualifying features) that are likely to be affected by the proposed development. Primary sources of contextual data for onshore ecology identified included:

- Ecological survey data collected for the TOWF ES during 2005;
- Sandwich Bay Bird Observatory;
- Cook, A.S.C.P., Barimore, C., Holt, C.A., Read, W.J. & Austin, G.E. (2013). Wetland Bird Survey Alerts 2009/2010: Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 641. BTO, Thetford;
- Griffiths, M. (2003). Numbers and distribution of the wintering golden plover population in and around the Thanet Coast & Sandwich Bay SPA 2002/2003. English Nature Research Reports;
- Henderson, A. & Sutherland, M. (2017). Numbers and distribution of Golden Plovers in the Thanet Coast and Sandwich Bay SPA during the winter of 2016/2017. A report for Natural England in March 2017;
- Musgrove, A J, Langston, R H W, Baker, H and Ward, R M (eds). 2003. Estuarine Waterbirds at Low Tide: the WeBS Low Tide Counts 1992/93 to 1998/99. WSG/BTO/WWT/RSPB/JNCC, Thetford;

- Swandale, T & Waite A 2012. Pegwell Bay Bird Disturbance Study: 2010 – 2011. Report for KWT;
- Pegwell Bay bird reports;
- Kent County Bird Recorder;
- Local birdwatchers with knowledge of the area;
- The North East Kent European Marine Sites Management Scheme (NEKEMSMS)/ Thanet Coast Project (TCP);
- Joint Nature Conservation Committee (JNCC) Natura 2000 Data Forms;
- Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.org.uk);
- Kent Ornithological Society (KOS);
- British Trust for Ornithology (BTO);
- 2011 Kent Bird Report; and
- Kent Ornithology Society (Winter Atlas 2007/08 – 2010/11 and Breeding Atlas 2008 - 2011).

Thanet Site Specific Surveys

6.6.7 In addition to the initial literature review, a range of site-specific surveys are being undertaken along the export cable corridor (onshore and intertidal) within an area extending to the 500 m and 1000 m buffer zone around the potential cable routes (see Figure 6.3) unless otherwise stated below:

- **Desk study:** data sources from Biological Records Centres and other relevant bodies, and from online mapping resources including Magic. Detailed ecological reports as summarised above and from Sandwich Bay Bird Observatory Trust (birds and wider ecology) (ongoing);
- **Habitats:** Extended Phase 1 habitat survey *;
- **Terrestrial Priority or notable invertebrates:** scoping surveys on targeted habitats within the Onshore Area of Interest plus a 50 m buffer, and any food and host plants they support as appropriate;
- **Protected species surveys: including** bats, badger, amphibians, water vole, otter, reptiles
- **National Vegetation Classification (NVC) surveys:** scoping survey*;
- **Breeding bird surveys:** bird walkover surveys to record wildfowl and waders using habitats (e.g. pasture, arable and saltmarsh) within or adjacent to the proposed infrastructure locations (onshore Substation and Cable Corridor); and
- **Wintering bird Survey (Intertidal counts):** intertidal counts at Pegwell Bay and Sandwich Bay have entailed mapping wader and wildfowl distributions over an intertidal survey area from pre-determined viewpoints (two at Pegwell or one at Sandwich).




* Follow on surveys may be undertaken if required. Alternatively, a reasonable worst case assessment will be undertaken with appropriate assumptions. The scenario/s and assumptions will be discussed and agreed with statutory consultees prior to assessment.

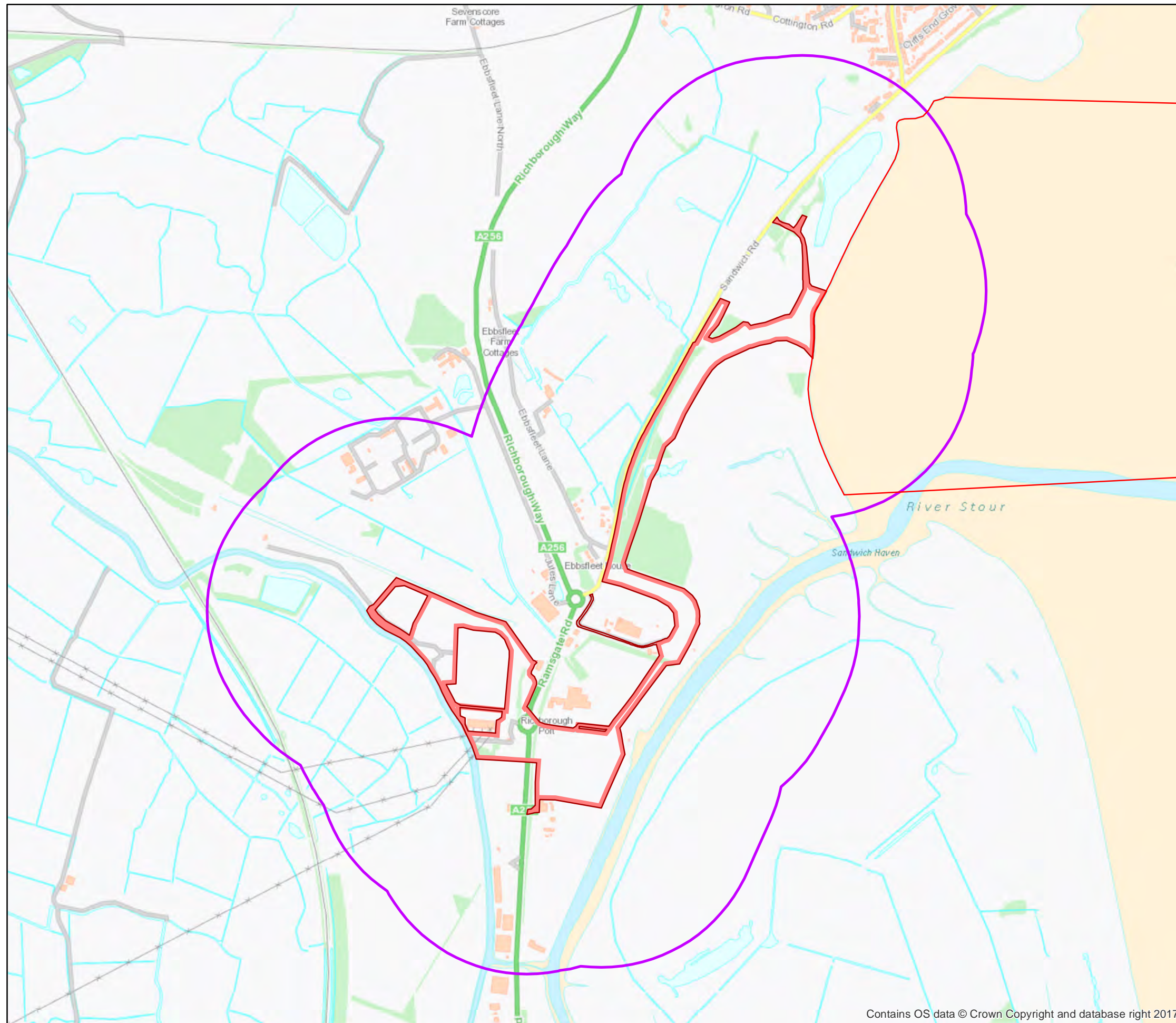
Note: no additional wintering birds surveys are planned as the data will not be available to inform the application prior to submission.

THANET EXTENSION OFFSHORE WIND FARM

Figure 6.3: Onshore Cable routes with 500 m buffer zone

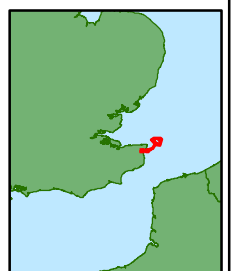
Legend

-  Proposed Site Boundary
-  Proposed Site Boundary
-  500m Buffer



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Projection: British National Grid



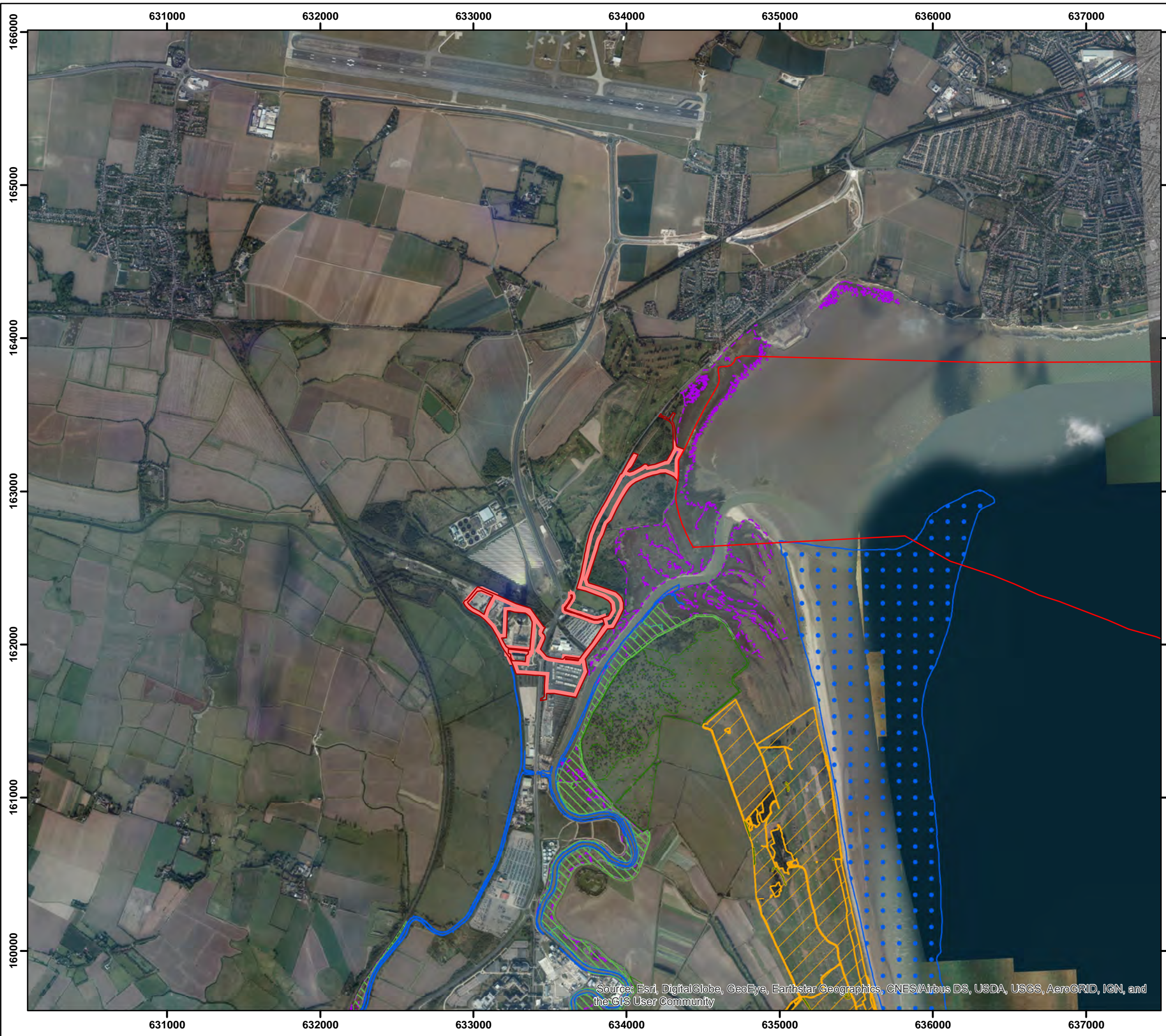
Contains OS data © Crown copyright and database right (2017)

N

0 0.3 0.6 Km

Scale: 1:12,500

Rev	0.1	By	SM	Date	8/15/2017
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**THANET EXTENSION
OFFSHORE WIND FARM**

Figure 6.4: Priority within the study area
(Natural England, 2015)

- Legend**
-  Proposed Site Boundary
 -  Proposed Site Boundary
 - Natural England Priority Habitats**
 -  Coastal saltmarsh
 -  Coastal sand dunes
 -  Lowland fens
 -  Mudflats
 -  Saltmarsh Extents (Environment Agency)

Projection: British National Grid

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0 0.65 1.3 Km

Scale: 1:25,000

Rev	0.1	By	SM	Date	15/08/2017
Drg No	0083_TEOW_Figure_6-4_NE_Priority_habs_Pegwell_v4				

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

7 Screening

7.1 Approach to Screening

7.1.1 The purpose of Screening is to identify the European and Ramsar sites (with their associated features) for consideration within the overall HRA process. The approach taken here to Screening is to present the information in a series of tables, ensuring the process is completed in a logical and transparent manner. Once screened in for consideration, then the potential for LSE will be determined; the determination of LSE is presented in Section 8.

7.2 Screening of sites

7.2.1 Screening is presented in this Report as a series of tables, each applying different criteria. It should be noted that as different criteria are applied in the different tests/ tables so different designated sites may be screened-in or screened-out in each of the tests. However, all designated sites which are screened-in under any of the tests will be taken forward for LSE assessment.

7.2.2 The Screening criteria applied are summarised in .

7.2.3 Table 7.1 below, with the relevant text for SPAs and Ramsar (where differing to that for SACs) provided in *italics*. It should be noted that an additional criterion has also been applied for offshore ornithology, which is described below.

7.2.4 A further criterion has been applied as relevant to sites considered for offshore ornithology – effectively considering whether the species occurs in more than trivial numbers. If it has not been shown to occur at all, or only in trivial numbers, in the recent site based surveys, then provided that the survey was capable of detecting that species (i.e. birds that migrate at night will not have been detected and birds that migrate in very short time windows could have been missed) then it has been considered that any such species can be screened out.

7.2.5 For migratory species, including those that migrate at night and those that migrate in very short time windows, the information on the analyses and Screening processes that have been applied recently to other OWFs proposed in the North Sea and the English Channel can be used to inform the Screening of the Thanet Extension project. Quantitative assessments have been carried out for Hornsea Project One OWF, East Anglia ONE OWF, East Anglia THREE OWF and Navitus Bay OWF using a migratory pathway modelling process and CRM to predict the numbers of migratory seabirds, waterfowl and shorebirds that might be at risk of collision mortality.

Table 7.1: Screening criteria for the initial identification of SACs, SPAs and Ramsar Sites.

Criteria used for initial identification of European and Ramsar Sites		Specific criteria
1	European or Ramsar site that overlaps with Thanet Extension boundary (array, cable corridor, substation AoS)	Physical overlap between project boundary and designated site
2	SAC supports mobile populations of qualifying features (e.g. marine mammals, migratory fish, bats and otters) that may interact with potential effects associated with Thanet Extension <i>SPA or Ramsar site has interest features that nest and raise their young within the site during the breeding season and then occur in the region of Thanet Extension outside the breeding season, either on migration (passage) or throughout the winter</i>	Where a designated site hosts a mobile species whose range may include Thanet Extension– e.g. North Sea Management Unit for cetaceans <i>Identified by the application of the information on migratory movements and winter distribution (e.g. Wernham et al., 2002; Balmer et al., 2013)</i>
3	SAC with qualifying species whose mean maximum foraging or migratory range overlaps with Thanet Extension <i>SPA or Ramsar site is outside the offshore zone (i.e. above MLWS) but has interest features that, whilst nesting onshore, forage offshore during the breeding season</i>	Where a qualifying species has a known foraging or migratory range that includes Thanet Extension (e.g. seals). <i>Identified by the application of the mean maximum foraging range from the standard reference: Thaxter et al. (2012)</i>
4	SAC and/ or a qualifying feature located within the potential range of effect associated with Thanet Extension <i>SPA or Ramsar site overlaps with the potential extent of impacts associated with Thanet Extension</i>	Where the potential effects associated with Thanet Extension extend beyond the boundary of the project and reach a designated site <i>Identified by a physical overlap of the designated site and the potential extent of impact</i>
5	SAC qualifying habitat or species recorded during site specific surveys <i>SPA or Ramsar site has interest features that use that site in the non-breeding season and then occur in the region of Thanet Extension on migration (passage)</i>	Presence of a qualifying habitat or species at Thanet Extension that can be associated with a SAC <i>Identified by the application of the information on migratory movements to and from the UK in the standard reference: Wright et al., 2012</i>

7.2.6 Quantitative assessments have been carried out for the Scottish east coast and Rampion OWF using a simpler migratory pathway process and CRM to predict the numbers of migratory seabirds, waterfowl and shorebirds that might be at risk of collision mortality. In all cases the predicted mortality has been well below a level that when applied in a HRA Screening process has led to a LSE being identified and the sites for which the migratory birds are interest features have been screened out. This knowledge can be applied in the Screening of Thanet Extension, a project with a smaller number of WTGs than those already screened through a quantitative migratory pathway analysis and it can be concluded such interest features and associated sites can be screened out on the basis of a minimal number of birds at risk.

7.2.7 The Screening relevant to ornithology has taken account of the ornithological interest features of classified SPAs, listed Ramsar sites, potential SPAs and proposed Ramsar sites, the latter two categories of site being included in accordance with the Government policies set out in ODPM and Defra (2005) and DCLG (2012). This Screening will be revisited when the quantitative evidence base is available from collision risk modelling (CRM) carried out, as most recently advised by NE, using the MSExcels based model (Band, 2012). An initial CRM carried out using the R-programme based model (Masden, 2015) on 13 months of aerial survey data collected between March 2016 and March 2017 inclusive has been discussed with NE. Given that NE were concerned about issues with the Masden model implementation those CRM results have not been used in this Screening Report. It should be noted that if a species was not detected in the surveys then the outcome will be that, as there will be a zero flight density to be placed in the model, there will be no collision risk. It is only for the more numerous species where the conclusion of the CRM could be that a species is screened out when currently it has been screened in on a precautionary basis due to the absence of a quantitative evidence base.

7.3 Potential Impacts

7.3.1 The potential for the construction, operation and decommissioning of Thanet Extension to result in an environmental effect has been summarised in Table 7.3 (offshore) and Table 7.4 (onshore). For the purposes of Screening, and given the limited information available, the potential for effect during decommissioning is assumed to be the same (but likely to be less) as for construction.

7.3.2 It is noted that the terminology applied to the potential effects identified in Table 7.3 for subtidal and intertidal benthic ecology may differ to the activities identified in the relevant advice on operations. For clarity, the equivalent terms, as sourced from the

relevant advice on operations¹ as relevant for cables and offshore wind, are defined in Table 7.2 below (noting that these may be considered temporary or ongoing according to the stage of development).

Table 7.2: Comparison of Relevant Terms used to Define Potential Effect for Subtidal and Intertidal Benthic Ecology

Potential effect term applied here	Equivalent term(s) from Advice on Operations
Temporary habitat loss/ disturbance	Abrasion/ disturbance of the substrate on the surface of the seabed Habitat structure changes - removal of substratum (extraction) Penetration and/ or disturbance of the substratum below the surface of the seabed, including abrasion
Increases in suspended sediments, with subsequent deposition	Changes in suspended solids (water clarity) Smothering and siltation rate changes (Light-heavy)
Accidental pollution	Deoxygenation Temperature decrease (Cables – in operation) Temperature increase (Cables – in operation)
Changes to physical processes	Water flow (tidal current) changes, including sediment transport considerations
Long-term physical loss of habitat	Habitat structure changes - removal of substratum (extraction) Penetration and/ or disturbance of the substratum below the surface of the seabed, including abrasion Physical loss (to land or freshwater habitat)
Introduction of hard substrate	Introduction or spread of invasive non-native species (INIS) Physical change (to another sediment type)
EMF	Electromagnetic changes

¹ Advice on operations sourced from <https://www.gov.uk/topic/planning-development/protected-sites-species> - noting that advice is available for the Margate and Longsands SCI, with the advice on the Thanet Coast MCZ assumed to apply for the Thanet SAC. No similar advice is as yet available for the Sandwich Bay SAC, with the full list of activities applied as relevant.

7.4 Identification of Sites and Features

- 7.4.1 The following Sections identify the sites (and their features) for which there is potential connectivity with Thanet Extension and therefore those sites which have been taken forward for determination of LSE with the offshore and onshore components of Thanet Extension in Section 8.
- 7.4.2 The approach to Screening for SACs follows the five Screening criteria identified in Table 7.1, taking each criterion in turn, with these criteria presented in Table 7.5 to Table 7.9. Each of the Screening criteria will encompass different designated sites and features, although it is feasible that no sites may be identified through a specific criterion. Table 7.10 provides a summary of all designated sites and features identified through the Screening process and for which potential LSE cannot be discounted.
- 7.4.3 Table 7.5 identifies the European and Ramsar sites identified through Screening criterion 1, essentially encompassing those sites which have physical overlap with the project boundary. These are the sites with which the project has direct connectivity and therefore the potential for LSE exists. These sites are shown in Figure 7.1.
- 7.4.4 Screening criterion 2 identifies those SACs which support a population of mobile species, specifically where the natural range of that species may include Thanet Extension, together with those SPAs or Ramsar sites where the migratory movements and or winter distribution coincides with Thanet Extension. These sites, including the identified range of the species, are depicted in Figure 7.2 and listed in Table 7.6.
- 7.4.5 Screening criterion 3 addresses European and Ramsar sites hosting designated species whose mean maximum foraging or migratory ranges overlap with Thanet Extension, with the relevant sites identified in Table 7.7. This criterion again brings in designated sites potential located at distance from Thanet Extension, but where associated species may range as far as the project. The migratory or foraging range applied during the Screening, together with the relevant reference, is also provided for clarity. These sites are depicted in Figure 7.3.
- 7.4.6 It is acknowledged through Screening criterion 4 that the potential for effect associated with Thanet Extension may extend beyond the project boundary. To ensure the potential for effect on designated sites with the maximum range of effect is identified, these are presented in Figure 7.4 and Table 7.8. The relevant range of effect draws on the maximum range presented in Table 7.4, as relevant to the receptor type.
- 7.4.7 The final Screening criterion, criterion 5, allows for the inclusion of a qualifying habitat or species within Thanet Extension provided that species can be associated with a designated SAC. The identified habitats and species are provided in Table 7.9; where designated sites are included but not yet depicted in a Figure, these are provided in Figure 7.5

Table 7.3: Anticipated effects from Thanet Extension on relevant receptors: Offshore

Receptor type	Potential effect	Potential range of effect	Justification
Construction			
Subtidal and intertidal benthic habitats	Temporary habitat loss/ disturbance	Within the project boundary	There is potential for temporary, direct habitat loss and disturbance due to cable laying operations (including cable protection), foundation installations and seabed preparation.
	Temporary increases in suspended sediments, with subsequent deposition	10 km*	There is the potential for a temporary increase in suspended sediments and subsequent deposition to result from construction operations; such as cable laying operations, foundation installations and seabed preparation.
			An increase in suspended sediment can affect the benthos e.g. through lower light levels, with deposition potentially leading to smothering.
	Accidental pollution	Within the project boundary	There is a risk of pollution being accidentally released from vessels and machinery used by the project, including construction and installation vessels and from the construction process itself.
			Such pollution can affect the sediment and water quality, with potential implications for the benthos.
Invasive non-native species	Within the project boundary	Spread of non-native, invasive species via construction activities.	
Diadromous fish species	Temporary increases in suspended sediments, with subsequent deposition	10 km*	There is the potential for a temporary increase in suspended sediments and subsequent deposition to result from construction operations; such as cable laying operations, foundation installations and seabed preparation.
			There is the potential for temporary increases in suspended sediments to have a direct effect on fish migration, e.g. through a change in water clarity, with subsequent deposition potentially affecting food sources.
	Increase in underwater noise	55 km±	Construction activities, in particular the pile-driving of foundations, will result in increased levels of underwater noise. Depending on the level of noise, potential impacts include permanent or temporary effects and behavioural disturbance in sensitive species.
	Temporary habitat loss/ disturbance	Within the project boundary	There is potential for temporary, direct habitat loss and disturbance due to cable laying operations (including cable protection), foundation installations and seabed preparation.
	Accidental pollution	Within the project boundary	There is a risk of pollution being accidentally released from vessels and machinery used by the project, including construction and installation vessels and from the construction process itself.
Such pollution can affect the sediment and water quality, with potential implications for the migratory fish.			

Receptor type	Potential effect	Potential range of effect	Justification
Marine mammals	Increase in underwater noise	26 km (JNCC, 2016). Note: These values might be updated during the application process if site specific information becomes available via modelling	Construction activities, in particular the pile-driving of foundations, will result in increased levels of underwater noise, with other activities such as vessel traffic during construction also leading to underwater noise. Potential for effect can range from lethal, permanent or temporary physiological injury through to disturbance.
	Collision risk	Along the transit route from port and within the project boundary	The increased vessel traffic during construction may result in an increased collision risk to marine mammals.
	Temporary increases in suspended sediments, with subsequent deposition	10 km*	There is the potential for a temporary increase in suspended sediments and subsequent deposition to result from construction operations; such as cable laying operations, foundation installations and seabed preparation.
			Increased suspended sediments may result in an impaired ability to forage.
	Accidental pollution	Within the project boundary	There is a risk of pollution being accidentally released from vessels and machinery used by the project, including construction and installation vessels and from the construction process itself.
			Such pollution can affect the sediment and water quality, with potential implications for marine mammals and their prey.
Changes in prey availability and behaviour	10 km*	Changes to prey availability can have an indirect effect on marine mammals.	
Offshore Ornithology	Direct disturbance and displacement	6.5 km #	The construction phase has the potential to affect birds in the marine environment through disturbance due to construction activities, including the installation of foundations, towers, blades, export cables and other infrastructure and the movement of vessels and helicopters. The disturbance created has the potential to result in displacement of birds from the site of construction, from a buffer around it and from routes used by vessels to access the construction site. This displacement would effectively result in temporary habitat loss through a reduction in the area available to birds for feeding, resting and moulting.

Receptor type	Potential effect	Potential range of effect	Justification
	Changes in prey availability and behaviour	Up to 55 km	Effects on habitats and prey species during the construction phase include those resulting from the production of underwater noise, as will occur during piling, and the creation of suspended sediments, as will occur during the preparation of the seabed for foundations. These effects might alter the behaviour or availability of bird prey species such as fish. Underwater noise might cause fish and mobile invertebrates to avoid the construction area or otherwise affect their behaviour. Suspended sediments might cause fish and mobile invertebrates to avoid the construction area. Suspended sediments might smother and hide immobile benthic prey. These processes result in less prey being available within the construction area and a buffer around it to foraging birds. Such potential effects on benthic invertebrates are outlined above.
Operation and Maintenance			
Subtidal and intertidal benthic habitats	Temporary habitat disturbance	Within the project boundary	The impacts are likely to be similar to those resulting from construction but the magnitude will be less. For example, the presence of jack-up vessels during maintenance may disturb the substrate (seabed). The frequency and duration of these impacts will be determined by the O&M requirements of the site.
	Release of sediment into suspension, with subsequent deposition	10 km*	Should scour or certain maintenance activities occur at the site, this would result in a release of suspended sediment into the water column. Redeposition of sediments out of the water column may result in the smothering of benthic prey species. However, the degree of sediment disturbance will be much reduced when compared to the construction phase.
	Accidental pollution	Within the project boundary	There is a risk of pollution being accidentally released from vessels and machinery used by the project, as well as from project infrastructure.
			Risk of temperature change in close proximity to operational cable.
			Such pollution can affect the sediment and water quality, with potential implications for the benthos.
	Changes to physical processes	Within the project boundary for waves and hydrodynamics** Up to 10 km for sediment pathways*	The presence of manmade structures such as scour protection and foundations may result in localised changes in hydrodynamics and wave regimes, with a potential effect on sediment transport pathways. This may affect benthic organisms as reduced water flows and so suspended food particles may inhibit feeding and growth. Alternatively, increased flows and scour may make the habitat less suitable for some species.
Long-term physical loss of habitat	Within the project boundary	The footprint/ presence of structures (i.e. WTGs, substations, possible scour protection and cable protection) will reduce the area of the habitat for benthic species.	

Receptor type	Potential effect	Potential range of effect	Justification
	Introduction of hard substrate	Within the project boundary	It is likely that the manmade structures placed on the seabed will be colonised by a range of marine species resulting in a localised increase in biodiversity. These structures also have the potential to act as artificial reefs however they may also facilitate the spread of non-native species.
	EMF	Within the project boundary	Uncertainty remains regarding the potential effect, with the advice on activities being to screen in for subsequent consideration based on best available evidence.
Diadromous fish species	Release of sediment into suspension, with subsequent deposition	10 km*	Should scour or certain maintenance activities occur at the site, this would result in a release of suspended sediment into the water column, with the potential to affect migratory fish. Re-deposition of sediments out of the water column may result in the smothering of benthic prey species. However, the degree of sediment disturbance will be much reduced when compared to the construction phase.
	Underwater noise	Localised to individual WTGs and vessels	Increased underwater noise resulting from the operational WTGs and increased vessel activity for O&M operations. This increase may result in disturbance of fish receptors. EMF emitted by the export and array cables during operation has the potential to lead to a behavioural response in fish. Note: the noise and associated impacts with the operational phase will be substantially lower in terms of magnitude when compared to construction and decommissioning.
	Temporary habitat disturbance	Within the project boundary	Maintenance activities may result in the temporary disturbance of benthic habitats. This may have an indirect effect on migratory fish via their prey species.
	Accidental pollution	Within the project boundary	There is a risk of pollution being accidentally released from vessels and machinery used by the project, as well as from project infrastructure.
			Such pollution can affect the sediment and water quality, with potential implications for migratory fish.
	Long-term physical loss of habitat	Within the project boundary	The footprint/ presence of structures (i.e. WTGs, substations, possible scour protection and cable protection) will reduce the area of the habitat for fish species and potential prey species.
	Introduction of hard substrate	Within the project boundary	It is likely that the manmade structures placed on the seabed will be colonised by a range of marine species, potentially including migratory fish or their prey. These structures also have the potential to act as artificial reefs however they may also facilitate the spread of non-native species.

Receptor type	Potential effect	Potential range of effect	Justification
	Changes to physical processes	Within the project boundary for waves and hydrodynamics. Up to 10 km for sediment pathways*.	The presence of manmade structures such as scour protection and foundations may result in localised changes in hydrodynamics and wave regimes, with a potential effect on sediment transport pathways. This may have an indirect effect on migratory fish via their prey species.
Marine mammals	Underwater noise	Localised to individual WTGs and vessels	Increased underwater noise resulting from the operational WTGs and increased vessel activity for O&M operations. This increase may result in disturbance of marine mammal receptors. EMF emitted by the export and array cables during operation has the potential to lead to a behavioural response in marine mammals. Note: the noise and associated impacts with the operational phase will be substantially lower in terms of magnitude.
	Long-term physical loss of habitat	Within the project boundary	The footprint/ presence of structures (i.e. WTGs, substations, possible scour protection and cable protection) will reduce the area of the habitat for benthic species.
	Collisions risk	Along the transit route from port and within the project boundary	The on-going vessel traffic during operation and maintenance may result in an increased collision risk to marine mammals.
	Accidental pollution	Within the project boundary	There is a risk of pollution being accidentally released from vessels and machinery used by the project, as well as from project infrastructure.
			Such pollution can affect the sediment and water quality, with potential implications for marine mammals or their prey.
Changes in prey availability	Within the project boundary	Changes in the fish communities resulting from O&M activities may lead to a loss of prey resources for marine mammals.	
Ornithology	Direct disturbance and displacement	6.5 km #	The presence of the operating WTGs has the potential to directly disturb and displace birds from within and around the proposed OWF. This has the potential to reduce the area available to birds for feeding, resting and moulting. Vessel activity associated with routine and unplanned maintenance also has the potential to disturb and displace birds, equally resulting in a reduction in the area available to birds for feeding, resting and moulting. The potential for impact on offshore birds from operational disturbance and displacement effects is greater for birds that occupy an area for a long period such as when they are breeding nearby or are resident for the winter. Displacement of birds on passage (migration) is more appropriately better considered in terms of a barrier effect (dealt with below).

Receptor type	Potential effect	Potential range of effect	Justification
	Indirect impacts through effects on habitats and prey species	Up to 10 km	Effects on habitats and prey species during the operation phase include those resulting from the production of underwater noise, as will occur through the turning of the wind WTGs, the production of electro-magnetic fields (EMF) and the generation of suspended sediments, as will occur due to scour around foundations or maintenance activities. These effects might alter the behaviour or availability of bird prey species such as fish and invertebrates as already described for the construction phase above. Similarly, these processes result in less prey being available within the operation area and a buffer around it to foraging birds. Such potential effects on benthic invertebrates are outlined above.
	Risk of collision	Requires bird to fly across the rotor swept area	Birds which fly through the proposed WTG array whilst foraging for food, commuting between breeding sites and foraging areas or passing through on migration are at potential risk of collision with the WTG rotors and associated infrastructure. This might result in injury or death. The probability of this occurring is predicted through collision risk modelling (CRM).
	Barrier effect	Requires bird to seek to fly across site of OWF	The presence of the operating Thanet Extension could potentially create a barrier to seasonal migratory movements and/ or regular foraging flights. The result would be permanent changes in bird flight routes. A bird making a detour around a WTG array would fly a greater distance, either daily or seasonally, which would increase its energy expenditure and potentially decrease its survival chances or those of the dependent young for which it was making foraging flights. Such effects might be expected to be greater on birds that regularly commute around a wind farm rather than on migrants that might encounter the wind farm once or twice per year.
Decommissioning			
Subtidal and intertidal benthic habitats	The impacts during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase.		
Diadromous fish species	The impacts during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase.		
Marine mammals	The impacts during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase.		
Ornithology	The impacts during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase.		

* It was concluded in the TOWF assessment that sand and coarse materials would only be dispersed over a short distance (typically meters) however silt and chalk would be carried in suspension across the full spring tidal excursion (approximately 10 km). Chalk sands, even at low concentrations, would cause the seawater to appear ‘milky’ when in suspension. A full physical processes assessment, including tidal excursions, will be undertaken for Thanet Extension and could be used to inform an AA. A dispersion of 10 km for very fine material is also supported by the observed turbid wakes at TOWF (ABPmer, 2017). This will be re-visited if required on receipt of the tidal excursion assessment being undertaken for the Thanet Extension project.

** The TOWF concluded that the effects on waves would be localised in proximity to the WTGs resulting from reflection and diffraction. Flow separation zones and increased turbulence would occur downstream of the WTG. Standard guidance (Lamb, 1932) suggests this typically extends 6-

10 the structure diameter. Therefore, based on a 10 m diameter foundation would result in 60 to 100 m.

† Based on the existing Thanet OWF Environmental Statement (Royal Haskoning, 2005).

± This is a precautionary value taken from noise modelling of piling (with a similar hammer energy) in UK coastal waters. This distance was associated with behavioural disturbances in spawning herring species. This value has been taken from recent experience in underwater modelling for species relevant to Thanet Extension. Please note this was a modelling assessment and not an observational assessment/ survey.

The value of 6.5 km is taken from the distance at which a level of displacement significantly greater than zero for red-throated diver could be detected being during the monitoring of the construction phase of the nearby London Array OWF (APEM, 2016).

Table 7.4 Anticipated effects from Thanet Extension on relevant receptors: Onshore








Project Phase	Receptor Type	Potential effect	Justification
Construction	Habitats	Habitat loss	Temporary loss of habitats and habitat availability from designated site
			Loss/ degradation of habitats where these are a designated site interest feature in their own right
			Temporary loss of use of functionally connected habitats; where such loss/ degradation would have an indirect, detrimental effect on species interest features
		Release of sediment into suspension, with subsequent deposition	There is the potential for a temporary increase in suspended sediments and subsequent deposition to result from construction operations; such as cable laying operations, foundation installations and seabed preparation. Included here in relation to the potential to affect intertidal habitats supporting designated species
	Pollution	Degradation of habitats via pollution pathways	
	Species	Noise disturbance	Noise based disturbance during construction
		Spread of non-native, invasive species	Spread of non-native, invasive species via construction activities
		Habitat loss	Temporary habitat fragmentation and species isolation
Visual disturbance		Visual disturbance during construction	
Operation	Habitats	Habitat loss or disturbance	Temporary loss of use or disturbance to designated or functionally connected habitats during maintenance (in addition to any permanent habitat loss of a designated site already occurring as a result of construction)
		Change to physical processes	The presence of manmade structures such as scour protection and foundations may result in localised changes in hydrodynamics and wave regimes, with a potential effect on sediment transport pathways. Alternatively, increased flows and scour may make the habitat less suitable for some species. Included here in relation to the potential to affect intertidal habitats supporting designated species
		EMF	Uncertainty remains regarding the potential effect, with the advice on activities being to screen in for subsequent consideration based on best available evidence. Included here in relation to the potential to affect intertidal habitats supporting designated species
		Release of sediment into suspension, with subsequent deposition	Should scour or certain maintenance activities occur at the site, this would result in a release of suspended sediment into the water column. Redeposition of sediments out of the water column may result in the smothering of benthic prey species. However, the degree of sediment disturbance will be much reduced when compared to the construction phase. Included here in relation to the potential to affect intertidal habitats supporting designated species
		Pollution	Degradation of habitats via pollution pathways during operational maintenance

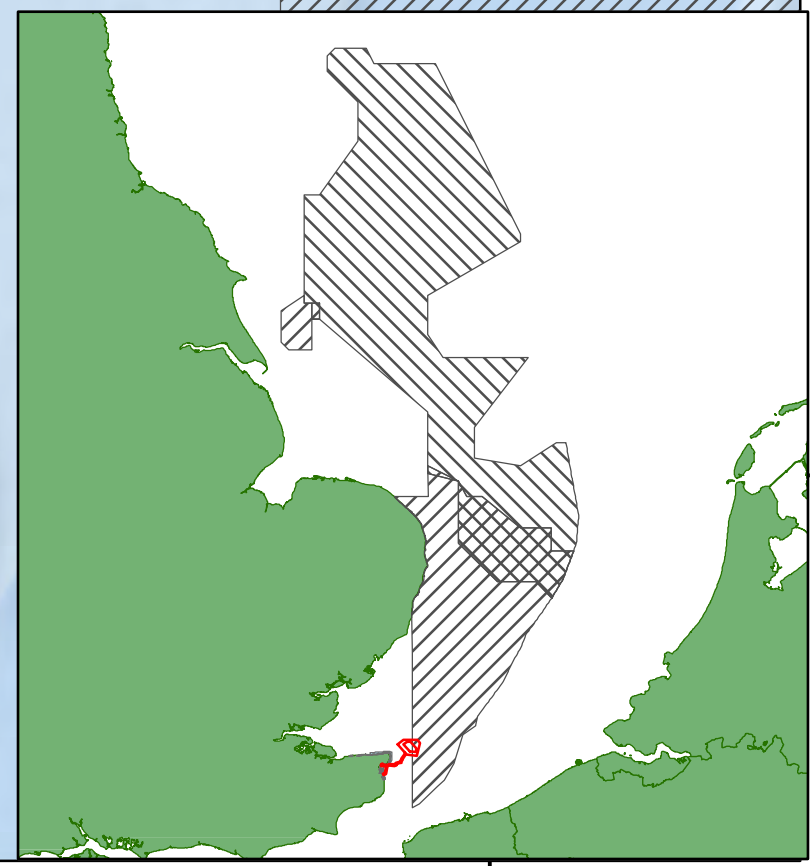
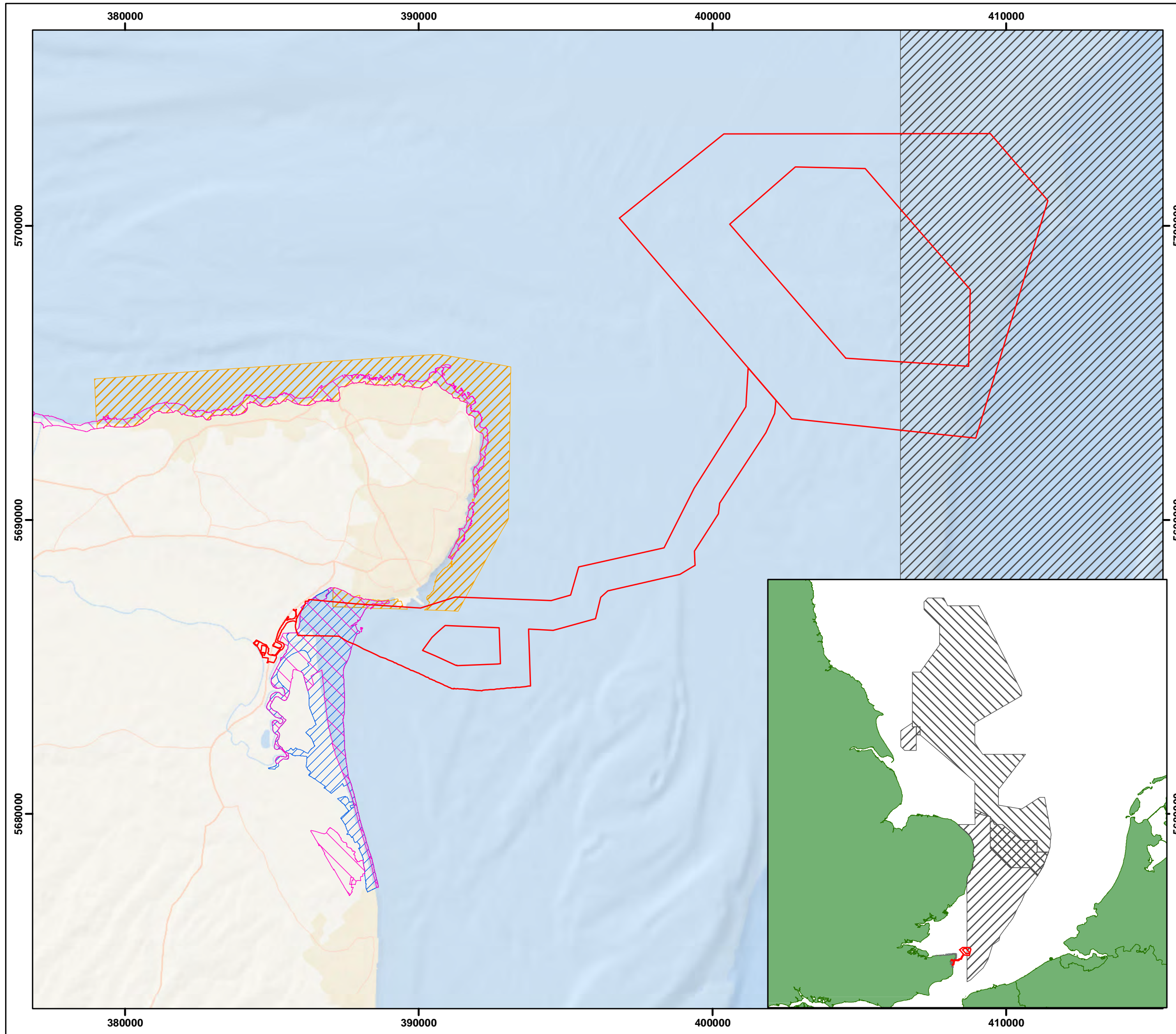
Project Phase	Receptor Type	Potential effect	Justification
	Species	Noise disturbance	Noise based disturbance during operational maintenance
		Visual disturbance	Visual disturbance during operational maintenance
Decommissioning	Habitats	The impacts during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase	
	Species		

THANET EXTENSION OFFSHORE WIND FARM

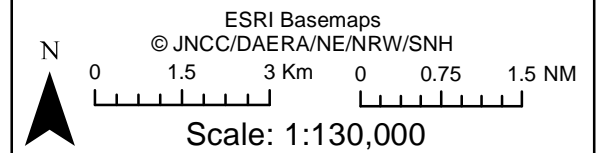
Figure 7.1: European and Ramsar Sites which Overlap with proposed Project Boundary

Legend

-  Proposed Site Boundary
-  Southern North Sea cSAC (Summer and Winter Area)
-  Southern North Sea cSAC (Summer Area)
-  Southern North Sea cSAC (Winter Area)
-  Sandwich Bay SAC
-  Thanet Coast SAC
-  Thanet Coast and Sandwich Bay SPA and Ramsar Site



Projection: ETRS 1989 UTM Zone 31N



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Table 7.5 European and Ramsar sites which overlap with the Thanet Extension project boundary

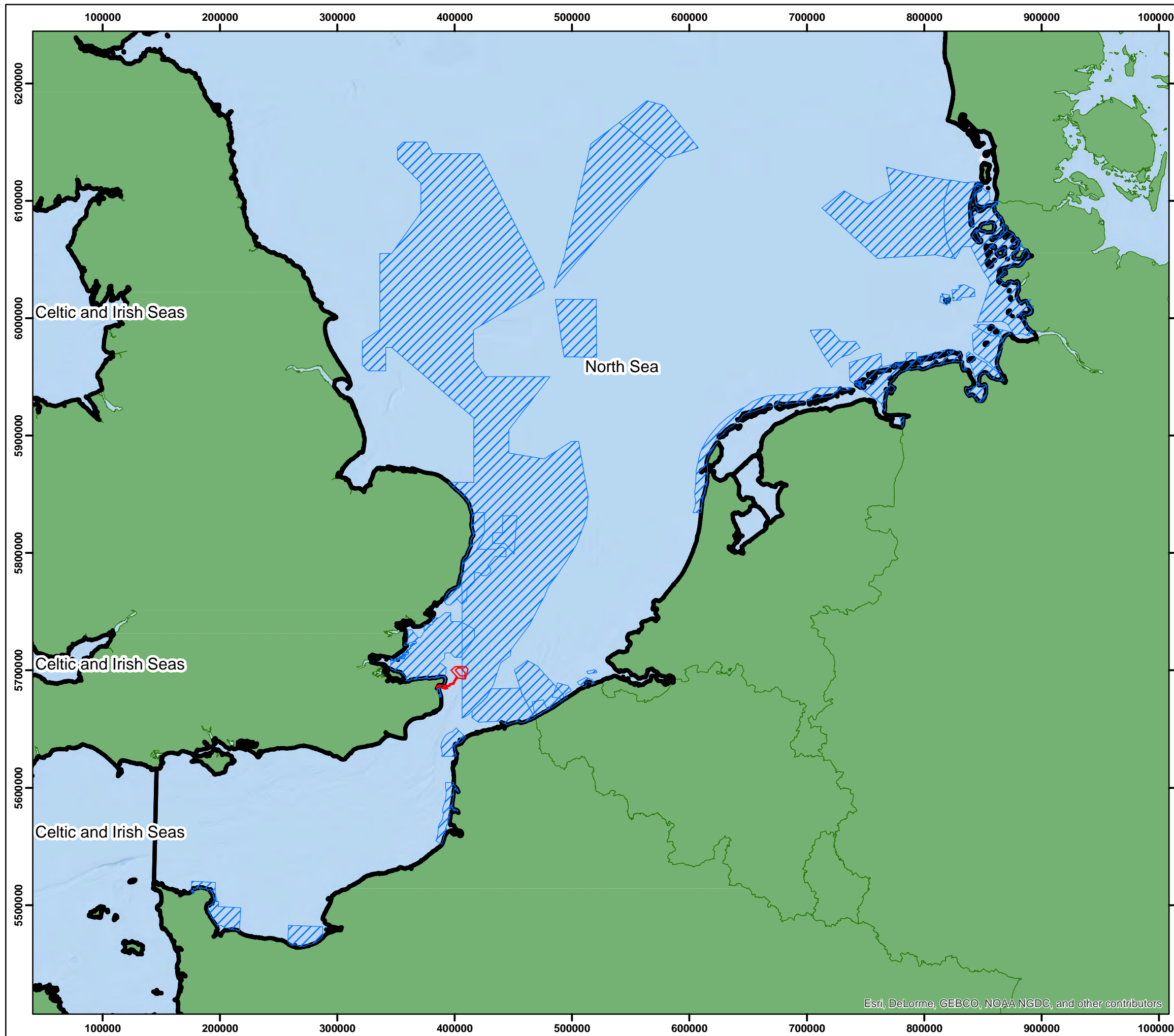
Site	Designated Feature(s)	Overlap with			
		Array	Offshore Cable Corridor	Onshore Cable Corridor (all options)	Substation AoS
Southern North Sea cSAC (winter area)	Harbour porpoise (<i>Phocoena phocoena</i>)	✓	X	X	X
Sandwich Bay SAC	Annex I habitats that are a primary reason for selection of this site: Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes") Fixed coastal dunes with herbaceous vegetation ("grey dunes") Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site Humid dune slacks	x	Intertidal ✓	✓	X
Thanet Coast SAC	Reefs Submerged or partially submerged sea caves	X	✓	X	X
Thanet Coast and Sandwich Bay SPA	Ruddy turnstone (Non-breeding) Little tern (Breeding) European golden plover (Non-breeding)	X	Intertidal ✓	✓	X
Thanet Coast and Sandwich Bay Ramsar	Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates	X	Intertidal ✓	✓	X

THANET EXTENSION OFFSHORE WIND FARM

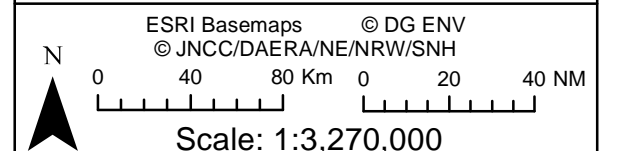
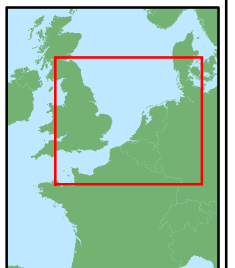
Figure 7-2: Sites identified in Table 7-5

Legend

-  Proposed Site Boundary
-  Sites Identified in Table 7-5
-  Harbour Porpoise Management Units



Projection: ETRS 1989 UTM Zone 31N



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Drg No	0083_TEOW_Figure7-2_Mobile_species_sites_v4				

Table 7.6: Mobile species supported by European and Ramsar sites which may interact with potential effects associated with Thanet Extension

Site	Designated Species ¹	Mobile Species Range ²	Distance to (km)			
			Array	Offshore Cable Corridor	Onshore Cable Corridor (all options)	Substation AoS
Southern North Sea cSAC (all areas)	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	0 km	4 km	N/A	N/A
Vlaamse Banken SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	39 km	49 km	N/A	N/A
Klaverbank SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	277 km	287 km	N/A	N/A
Noordzeekustzone SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	234 km	245 km	N/A	N/A
Vlakte van de Raan SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	101 km	110 km	N/A	N/A
Borkum-Riffgrund SCI	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	402 km	414 km	N/A	N/A
Sylter Aussenriff SCI	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	493 km	505 km	N/A	N/A
Helgoland mit Helgolander Felssockel SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	509 km	521 km	N/A	N/A
Steingrund SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	519 km	530 km	N/A	N/A
NTP S-H Wattenmeer und angrenzende Küstengebiete SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	525 km	536 km	N/A	N/A
Nationalpark Niedersächsisches Wattenmeer SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	408 km	419 km	N/A	N/A
SBZ 1 / ZPS 1	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	60 km	67 km	N/A	N/A
SBZ 2 / ZPS 2	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	75 km	82 km	N/A	N/A
SBZ 3 / ZPS 3	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	94 km	103 km	N/A	N/A
Hamburgisches Wattenmeer SCI	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	521 km	532 km	N/A	N/A
Kosterfjorden-Vaderofjorden SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	991 km	1002 km	N/A	N/A
Baie de Seine orientale SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	241 km	227 km	N/A	N/A
Baie de Seine occidentale SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	269 km	252 km	N/A	N/A

Site	Designated Species ¹	Mobile Species Range ²	Distance to (km)			
			Array	Offshore Cable Corridor	Onshore Cable Corridor (all options)	Substation AoS
Recifs et marais arriere-littoraux du Cap Levi a la Pointe de Saire SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	270 km	252 km	N/A	N/A
Baie de Canche et Couloir des trois estuaries SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	89 km	80 km	N/A	N/A
Recifs Griz-Nez Blanc-Nez	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	43 km	34 km	N/A	N/A
Bancs de Flandres SCI	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	23 km	27 km	N/A	N/A
Doggerbank SCI	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	465 km	476 km	N/A	N/A
Doggersbank SAC	Harbour porpoise <i>Phocoena phocoena</i>	North Sea	331 km	341 km	N/A	N/A
Outer Thames Estuary SPA ³	Red-throated diver <i>Gavia stellata</i>	-	4 km	7 km	N/A	N/A

¹ Sites with mention of harbour porpoise initially identified through <http://natura2000.eea.europa.eu/#> , followed by cross checking site details and other HRA documents to confirm as a designated feature



² Assumes that harbour porpoise range throughout the North Sea Management Unit, as defined by http://jncc.defra.gov.uk/pdf/Report_547_webv2.pdf

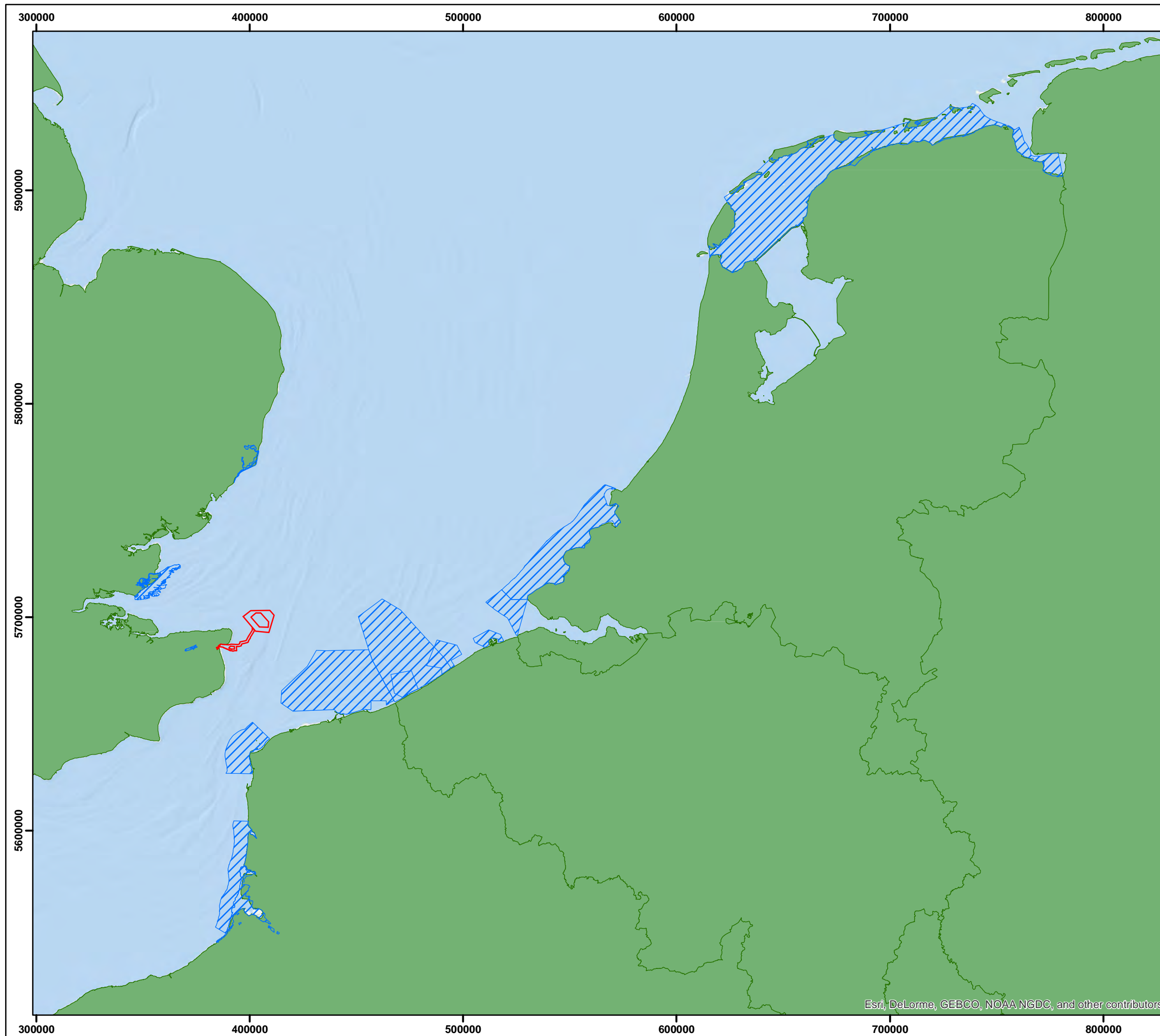
³ We acknowledge that based on a 4 km buffer the export cable activities would be screened out of the Outer Thames Estuary SPA. However, given the proximity of activities within and outside the array and that the proposed activities are for the same project, we will consider all relevant project activities on the Outer Thames Estuary SPA.

THANET EXTENSION OFFSHORE WIND FARM

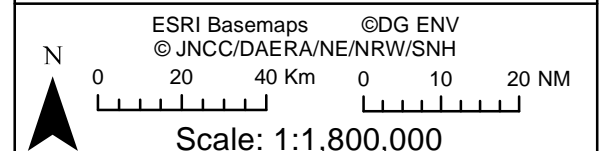
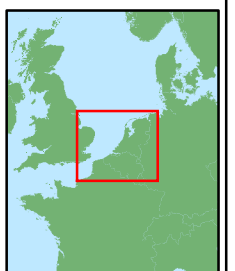
Figure 7.3: European and Ramsar sites supporting mobile species whose range overlaps with Thanet Extension

Legend

-  Proposed Site Boundary
-  Sites identified in Table 7.6



Projection: ETRS 1989 UTM Zone 31N



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Table 7.7: Mobile species supported by European and Ramsar sites whose mean maximum foraging or migratory range/route overlaps with Thanet Extension.

Site	Designated Species	Migratory or Foraging Range	Distance to (km)			
			Array	Offshore Cable Corridor	Onshore Cable Corridor (all options)	Substation AoS
Bancs des Flandres	Harbour Seal <i>Phoca vitulina</i> ³	120 km	23	27	N/A	N/A
Baie de Canche et couloir des trois estuaires			89	80	N/A	N/A
Vlakte van de Raan			101	110	N/A	N/A
Voordelta			107	117	N/A	N/A
Estuaires et littoral picards (baies de Somme et d'Authie)			103	103	N/A	N/A
Recifs Gris-Nez Blanc-Nez			43	34	N/A	N/A
Vlaamse Banken			39	49	N/A	N/A
Bancs des Flandres	Grey Seal <i>Halichoerus grypus</i> ⁴	145 km	23	27	N/A	N/A
Recifs Gris-Nez Blanc-Nez			43	34	N/A	N/A
Baie de Canche et couloir des trois estuaires			89	80	N/A	N/A
Vlakte van de Raan			101	110	N/A	N/A
Estuaires et littoral picards (baies de Somme et d'Authie)			103	103	N/A	N/A
Vlaamse Banken			39	49	N/A	N/A
Voordelta			107	117	N/A	N/A
SBZ 1			67	67	N/A	N/A
SBZ 2			82	82	N/A	N/A
SBZ 3			102		N/A	N/A
Vlaamse Banken	River lamprey <i>Lampetra fluviatilis</i>	55 km	39	49	N/A	N/A

	Sea lamprey <i>Petromyzon marinus</i>				N/A	N/A
Alde-Ore Estuary SPA	Lesser black-backed gull <i>Larus fuscus</i>	141 km	61	N/A	N/A	N/A
Alde-Ore Estuary Ramsar	Lesser black-backed gull <i>Larus fuscus</i>	141 km	61	N/A	N/A	N/A
Foulness (Mid-Essex Coast Phase 5) SPA	Sandwich tern <i>Thalasseus sandvicensis</i>	49 km	39	N/A	N/A	N/A
Stodmarsh SPA	Non-breeding: Great bittern <i>Botaurus stellaris</i> , Hen harrier <i>Circus cyaneus</i> , Gadwall <i>Anas strepera</i> , Northern shoveler <i>Anas clypeata</i> Breeding: Gadwall, Waterbird assemblage, Breeding bird assemblage	20 km	N/A	N/A	TBC	C9.2
Stodmarsh Ramsar	<i>Ramsar Criterion 2</i> : Six British Red Data Book wetland invertebrates; two nationally rare plants, and five nationally scarce species; and a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern shoveler- non-breeding and hen harrier – non-breeding)	20 km	N/A	N/A	TBC	C9.2






³ Sites with mention of harbour seal initially identified through <http://natura2000.eea.europa.eu/#>, followed by cross checking to confirm as a designated feature

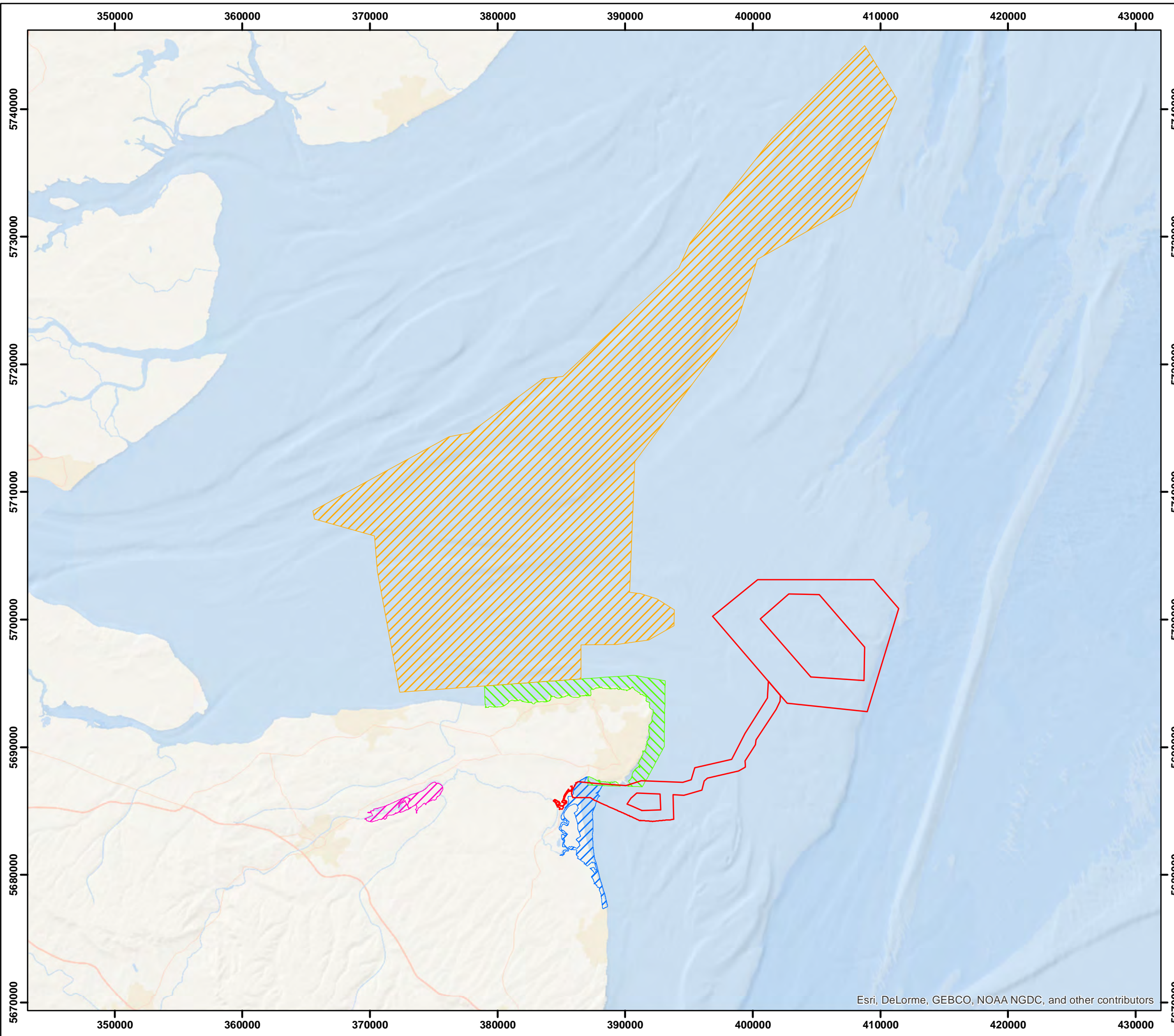
⁴ Sites with mention of grey seal initially identified through <http://natura2000.eea.europa.eu/#>, followed by cross checking to confirm as a designated feature

**THANET EXTENSION
OFFSHORE WIND FARM**

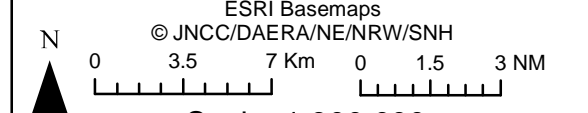
Figure 7.4: Designated habitat within a European or Ramsar Site located within the potential extent of effects

Legend

-  Proposed Site Boundary
-  Margate and Long Sands SCI
-  Sandwich Bay SAC
-  Stodmarsh SAC
-  Thanet Coast SAC



Projection: ETRS 1989 UTM Zone 31N



Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

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Table 7.8: Designated Habitat within a European or Ramsar site located within the potential extent of effects associated with Thanet Extension





Site	Designated Habitat	Relevant Range of Effect ²	Distance to (km)			
			Array	Offshore Cable Corridor	Onshore Cable Corridor (all options)	Substation AoS
Thanet coast SAC	Reefs Submerged or partially submerged sea caves	10 km	6 km	0 km	N/A	C2.6 km
Sandwich Bay SAC	Annex I habitats that are a primary reason for selection of this site: Embryonic shifting dunes; Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes"); Fixed coastal dunes with herbaceous vegetation ("grey dunes") Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>); Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site; Humid dune slacks.	10 km	15 km	0 km	0 km	<0.5 km
Margate and Long Sands SAC	Sandbanks which are slightly covered by sea water all the time	10 km	3 km	7.5 km	N/A	N/A
Stodmarsh SAC	Annex II species that are a primary reason for selection of this site: Desmoulin's whorl snail <i>Vertigo moulinsiana</i>	10 km	N/A	N/A	9 km	9 km

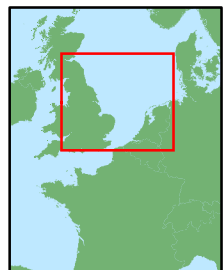
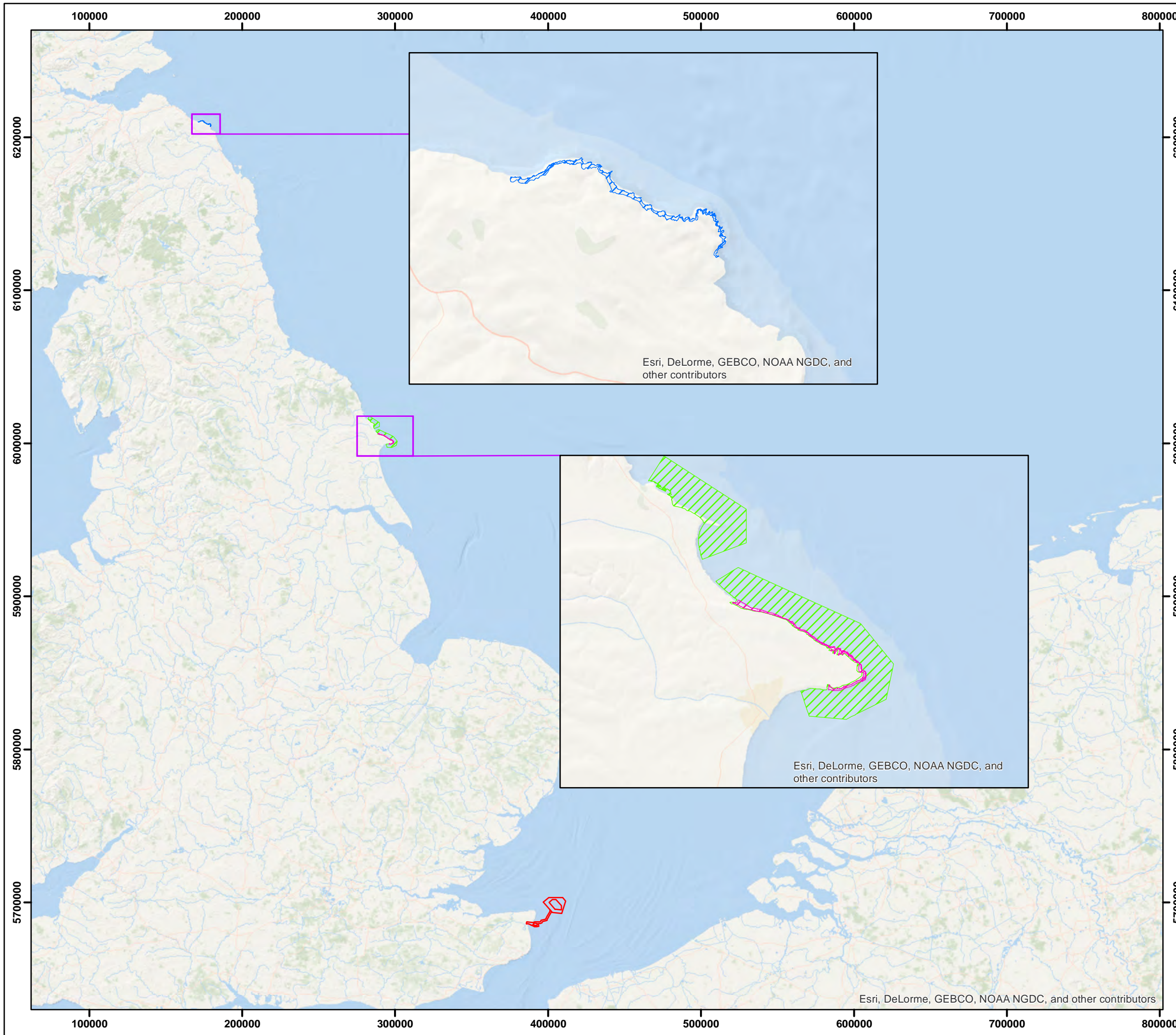
² Drawing on the maximum range relevant to the receptor identified in Table 7-1

THANET EXTENSION OFFSHORE WIND FARM

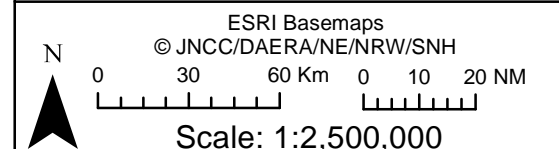
Figure 7-5: Sites identified in Table 7-8

Legend

-  Proposed Site Boundary
-  St Abb's Head to Fast Castle
-  Flamborough Head and Bempton Cliffs SPA
-  Flamborough and Filey Coast pSPA



Projection: ETRS 1989 UTM Zone 31N



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Table 7.9: SAC qualifying habitat or species recorded during site specific surveys and/ or utilising the site during the non-breeding season and on migration

Habitat or Species	Recorded				Site identified in Table 7.6 to Table 7.10
	Array	Offshore Cable Corridor [‡]	Onshore Cable Corridor (all options)	Substation AoS	
Harbour porpoise <i>Phocoena phocoena</i>	✓	✓	N/A	N/A	Numerous sites identified in Table 7.6 and Figure 7.2
Grey seal <i>Halichoerus gyprus</i>	✓	✓	N/A	N/A	Numerous sites identified in Table 7.7 and Figure 7.3
Harbour seal <i>Phoca vitulina</i>	✓	✓	N/A	N/A	
<i>S. spinulosa</i> reefs	✓	✓	N/A	N/A	None identified specifically for <i>S. spinulosa</i> reef. Habitat to be assessed within the PEIR only.
Red-throated diver <i>Gavia stellate</i>	✓		N/A	N/A	Outer Thames Estuary SPA – (Table 7.6 and Figure 7.2)
Fulmar <i>Fumarus</i>	✓		N/A	N/A	Not associated with any specific SPA or Ramsar site
Gannet <i>Morus</i>	✓		N/A	N/A	Flamborough and Filey Coast pSPA (Table 7.10 and Figure 7.5)
Kittiwake <i>Rissa</i>	✓		N/A	N/A	Flamborough and Filey Coast pSPA, Flamborough Head and Bempton Cliffs SPA, St Abbs Head to Fast Castle SPA (Table 7.10 and Figure 7.5)
Black-headed gull <i>Chroicocephalus ridibundus</i>	✓		N/A	N/A	Not associated with any specific SPA or Ramsar site
Common gull <i>Larus canus</i>	✓		N/A	N/A	Not associated with any specific SPA or Ramsar site
Lesser black-backed gull <i>Larus fuscus</i>	✓		N/A	N/A	Alde-Ore Estuary SPA and Ramsar Table 7.7, Table 7.10 and Figure 7.3
Herring gull <i>Larus argentatus</i>	✓		N/A	N/A	Flamborough and Filey Coast pSPA and St Abbs Head to Fast Castle SPA (Table 7.10 and Figure 7.5)
Great black-backed gull <i>Larus marinus</i>	✓		N/A	N/A	Not associated with any specific SPA or Ramsar site
Guillemot <i>Uria aalge</i>	✓		N/A	N/A	Flamborough and Filey Coast pSPA and St Abbs Head to Fast Castle SPA (Table 7.10 and Figure 7.5)
Razorbill <i>Alca torda</i>	✓		N/A	N/A	Flamborough and Filey Coast pSPA and St Abbs Head to Fast Castle SPA (Table 7.10 and Figure 7.5)

[‡] Surveys have not been undertaken within the offshore cable corridor for ornithology. However, given the close proximity, any species which have been recorded to be present within the Thanet Extension array are also assumed to be present within the offshore cable corridor and assessed accordingly.

7.4.8 Further to the Screening criteria drawn on above, it is important to highlight collision risk for bird species that comprise interest features of relevant SPA and Ramsar Sites. The manner in which such impacts are assessed (and Screening decisions made) will be on the basis of quantitative outputs from CRM. Those predictions depend primarily on:

- the scale of bird flight activity (derived from surveys that measure bird density in the area of the proposed OWF);
- the proportion of birds flying at potential collision height (derived from surveys that measure bird flight height in the area of the proposed OWF or from representative figures derived from analysis across many OWF studies);
- the extent to which each species takes avoiding action when approaching a WTG (derived from post-construction studies of OWFs and on a precautionary expert judgement basis);
- a set of bird parameters relating to size, flight speed etc. (derived from measurements); and
- a set of parameters relating to the design of the WTGs and array (supplied by the developer and WTG manufacturers).

7.4.9 The mathematical model generally applied is that developed originally for Scottish Natural Heritage (SNH) for application at onshore wind farms but has been developed and refined for use offshore (Band, 2012). The model has subsequently been incorporated in to a software package that is able to evaluate the effects of uncertainty in the input parameters (Masden, 2015). An initial CRM carried out using the R-programme based model (Masden, 2015) on 13 months of aerial survey data collected between March 2016 and March 2017 inclusive has been carried out. The results have been discussed with NE. NE has recently received a review of the Masden model and that has raised issues with its outputs. As a result the Masden model based CRM results of the Thanet Extension surveys have not been used in this Screening Report. As most recently advised by NE, the intention is to revert to using the MSExcels based model (Band, 2012) but that modelling has yet to be carried out. The result is that LSE Screening at this stage, based on the potential for collision risk, is unavoidably qualitative and based on the regular occurrence of any particular species in flight within the proposed Thanet Extension array from current data. Those bird species that were regularly observed in flight and at a flight height that might place them at risk of collision within the proposed boundary of the Thanet Extension array are:

- Fulmar
- Gannet
- Kittiwake
- Lesser black-backed gull
- Herring gull
- Great black-backed gull

7.4.10 All of these seabird species only occurred with any regularity and in any significant numbers in the non-breeding season i.e. as passage birds or as wintering birds. Table 7.10 associates these seabird species with the SPA and Ramsar sites on the east coast of England where they are breeding season interest features. There are no SPA and/ or Ramsar sites on the east coast of England with fulmar, black-headed gull, common gull or great black-backed gull as breeding season interest features.

Table 7.10: Screening in of SPA and Ramsar sites based on seabirds occurring in flight in Thanet Extension array area and hence potentially at risk of collision

Seabird regularly occurring in flight in Thanet Extension array	Designated site	Distance from Thanet Extension array (km)
Gannet	Flamborough and Filey Coast pSPA, see Figure 7.5	312
Kittiwake	Flamborough Head and Bempton Cliffs SPA, see Figure 7.5	322
	Flamborough and Filey Coast pSPA, see Figure 7.5	312
Lesser black-backed gull	St Abb's Head to Fast Castle SPA, see Figure 7.5	557
	Alde-Ore Estuary SPA, see Figure 7.3	69
Herring gull	Alde-Ore Estuary Ramsar, see Figure 7.3	69
	Flamborough and Filey Coast pSPA, see Figure 7.5	312
Guillemot	St Abb's Head to Fast Castle SPA, see Figure 7.5	557
	Flamborough and Filey Coast pSPA, see Figure 7.5	312
Razorbill	St Abb's Head to Fast Castle SPA, see Figure 7.5	557
	Flamborough and Filey Coast pSPA, see Figure 7.5	312

7.5 Summary of Screening



7.5.1 Following the Screening undertaken in Section 7.4 above, a number of sites have been identified, or 'screened in', for further consideration. These sites (together with the relevant features) are summarised in Table 7.11. It is these sites (together with their

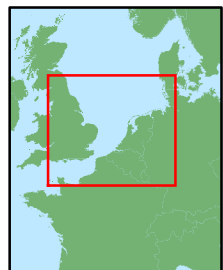
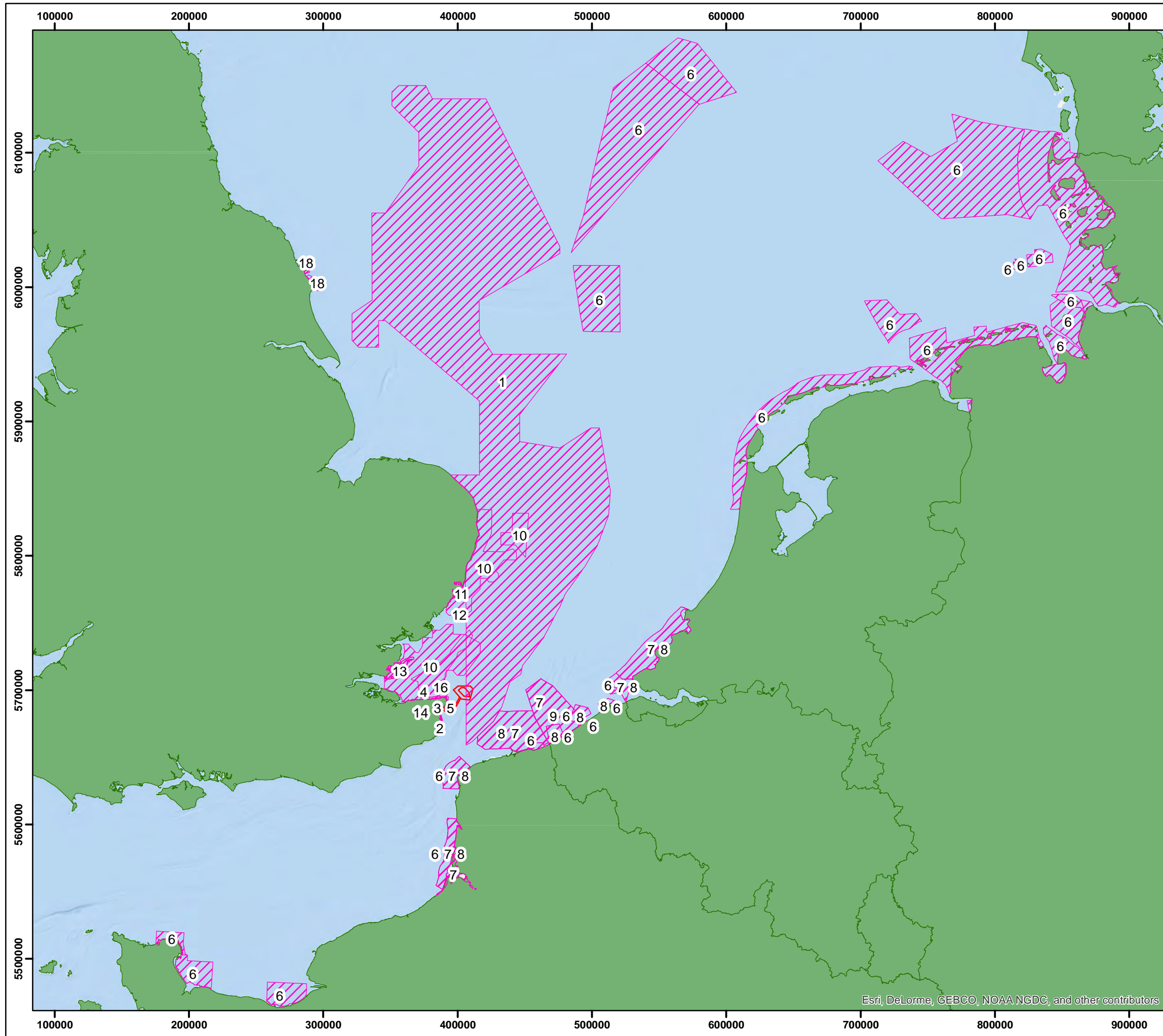
relevant feature(s)) that are taken forward for consideration of the potential for LSE in Section 8.

THANET EXTENSION OFFSHORE WIND FARM

Figure 7.6: European and Ramsar sites for which LSE cannot be discounted

Legend

-  Sites Identified in Table 7-10
-  Proposed Site Boundary



Projection: ETRS 1989 UTM Zone 31N

ESRI Basemaps
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0 30 60 Km 0 10 20 NM

Scale: 1:2,850,000

Rev	0.1	By	PN	Date	8/15/2017
Drg No	0083_TEOW_Figure_7-6_LSE_v4				

Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

Table 7.11: European and Ramsar sites for which LSE cannot be discounted

Designated site	Minimum Distance from project	Id number	Relevant Feature(s)
Southern North Sea cSAC	0 km	1	Harbour porpoise <i>Phocoena phocoena</i>
Sandwich Bay SAC	0 km	2	Annex I habitats that are a primary reason for selection of this site: Embryonic shifting dunes; Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes"); Fixed coastal dunes with herbaceous vegetation ("grey dunes") * Priority feature; Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>); Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site; Humid dune slacks.
Thanet coast SAC	0 km	3	Reefs Submerged or partially submerged sea caves
Thanet Coast & Sandwich Bay SPA	0 km	4	Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding)
Thanet Coast & Sandwich Bay Ramsar	0 km	5	Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates
Transboundary harbour porpoise sites (22 sites) ²	23 km	6	Harbour porpoise <i>Phocoena phocoena</i>
Transboundary harbour seal sites (7 sites)	23 km	7	Harbour seal <i>Phoca vitulina</i>
Transboundary grey seal sites (10 sites)	23 km	8	Grey seal <i>Halichoerus grypus</i>
Vlaamse Banken ³	39 km	9	Twaite shad <i>Alosa fallax</i> River lamprey <i>Lampetra fluviatilis</i> Sea lamprey <i>Petromyzon marinus</i>
Outer Thames Estuary SPA	4 km	10	Red-throated diver <i>Gavia stellate</i>
Alde-Ore Estuary SPA	69 km	11	Lesser black-backed gull <i>Larus fuscus</i>
Alde-Ore Estuary Ramsar	69 km	12	Lesser black-backed gull <i>Larus fuscus</i>

Designated site	Minimum Distance from project	Id number	Relevant Feature(s)
Foulness (Mid-Essex Coast Phase 5) SPA	37 km	13	Sandwich tern <i>Thalasseus sandvicensis</i>
Stodmarsh SPA	9 km	14	Great bittern <i>Botaurus stellaris</i> (Non-breeding) Hen harrier <i>Circus cyaneus</i> (Non-breeding) Gadwall <i>Anas strepera</i> (Breeding) Gadwall <i>Anas strepera</i> (Non-breeding) Northern shoveler <i>Anas clypeata</i> (Non-breeding) Waterbird assemblage Breeding bird assemblage
Stodmarsh Ramsar	9 km	15	<i>Ramsar Criterion 2:</i> Six British Red Data Book wetland invertebrates; two nationally rare plants, and five nationally scarce species; and a diverse assemblage of rare wetland birds – Gadwall <i>Anas strepera</i> (Breeding) Gadwall <i>Anas strepera</i> (Non-breeding) Great bittern <i>Botaurus stellaris</i> (Non-breeding) Northern shoveler <i>Anas clypeata</i> (Non-breeding) Hen harrier <i>Circus cyaneus</i> (Non-breeding)
Margate and Long Sands SAC	3 km	16	Sandbanks which are slightly covered by sea water all the time
Stodmarsh SAC	C9.2 km	17	Annex II species that are a primary reason for selection of this site: Desmoulin's whorl snail <i>Vertigo moulinsiana</i>
Flamborough and Filey Coast pSPA	312 km	18	Gannet <i>Morus</i> Kittiwake <i>Rissa</i> Guillemot <i>Uria aalge</i> Razorbill <i>Alca torda</i>
Flamborough Head and Bempton Cliffs SPA	322 km	19	Kittiwake <i>Rissa</i>
St Abb's Head to Fast Castle SPA	557 km	20	Gannet <i>Morus</i> Kittiwake <i>Rissa</i> Guillemot <i>Uria aalge</i> Razorbill <i>Alca torda</i>

² Single site within 26 km only (Bancs de Flandres SCI), the remainder being outwith 26 km (at least 39 km) but within the North Sea Management Unit.

³ Site also included transboundary for harbour porpoise, harbour seal and grey seal

8 Screening Assessment for Potential Likely Significant Effects

- 8.1.1 The initial Screening of sites completed in Section 7 above has identified a number of designated sites (with relevant habitats and or species), for which there is a need to consider the potential for Thanet Extension to have a LSE. This Section presents the consideration of LSE and therefore represents Stage 1 of the HRA process (as identified in Section 3.4 of this Report). Table 8.1 summarises the conclusions on LSE.
- 8.1.2 It should be noted that the determination of LSE presented here is based on the current understanding of the baseline environment and the project description. It is recognised that additional information will come forward prior to the completion of the RIAA and, if relevant, the sites and features included here for LSE may be amended based on such evidence.

Table 8.1: Determination for LSE

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
Construction				
Habitat loss and habitat disturbance	Offshore, there is potential for temporary, direct habitat loss and disturbance due to cable laying operations (including anchor placements), foundation installations and seabed preparation. Onshore, habitat loss relates to: the (temporary or long term) loss/ degradation of habitats where these are a designated site interest feature in their own right; loss of use of functionally connected habitats; where such loss/ degradation would have an indirect, detrimental effect on species interest features; and temporary habitat fragmentation and species isolation.	Thanet coast SAC – <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	Potential physical overlap with Annex I habitat (reefs). Where possible, cable route will be micro-routed to avoid features present. Given the baseline vessel traffic in the vicinity it is likely that damage from anchors will be negligible.	Potential LSE
		Margate and Long Sands SAC – <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. 	No potential overlap with Annex I habitats, given their location compared to the project.	No LSE
		Sandwich Bay SAC – <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Potential overlap with Annex I habitats. The feasibility of different installation methods are currently being explored, a potential mitigation may be to HDD below the features.	Potential LSE
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	Potential loss of habitat from the designated site and the potential for a temporary loss of use of functionally connected habitats.	Potential LSE
		Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> • Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) • Red Data Book wetland invertebrates 	Potential loss of habitat from the designated site and the potential for a temporary loss of use of functionally connected habitats.	Potential LSE
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twait shad • River lamprey • Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of physical effects associated with the construction of the project (up to 10 km) it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE
Temporary increases in suspended sediment concentrations, deposition of sediments and smothering.	Increased suspended sediment concentrations may arise due to cable laying operations (including anchor placements), foundation installations and seabed preparation. Increased	Thanet coast SAC – <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	Potential overlap between Annex I habitats (reefs) and the defined Screening buffer of increased suspended sediments.	Potential LSE
		Margate and Long Sands SAC – <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. 	Potential for the defined Screening buffer of increased suspended sediments to overlap with Annex I habitats/ habitats supporting SPA/ Ramsar site qualifying features.	Potential LSE
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 		

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE		
	sediment deposition will occur as sediments settle out of the water column.	Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) 	Terrestrial habitats therefore no potential for LSE from suspended sediment and subsequent deposition.	No LSE		
		Sandwich Bay SAC <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 				
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 			The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of a potential increase in suspended sediment (up to 10 km) it is considered that the potential for a significant effect to migratory fish is negligible.	No LSE
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 			Harbour porpoise occur naturally in turbid environments, with the potential level, extent and duration of any increase in suspended sediment (and subsequent deposition) being negligible as regards the ecology of the species and the extent of the cSAC.	No LSE
		Transboundary harbour porpoise sites (22 sites)			Marine mammals occur naturally in turbid environments, with the potential level, extent and duration of any increase in suspended sediment (and subsequent deposition) being negligible as regards the ecology of the species and the proximity of the designated sites (24 km as a minimum).	No LSE
		Transboundary harbour seal sites (7 sites)				No LSE
		Transboundary grey seal sites (10 sites)				No LSE
Accidental pollution	There is a risk of pollution being accidentally released from sources including construction and installation vessels/ vehicles, machinery and offshore fuel storage tanks and from the construction process itself. The release of such contaminants may lead to impacts on the species present, through toxic effects resulting in reduced diversity, abundance and biomass, but also through degradation of	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	A number of mitigation measures and best practice approaches will be implemented during the construction phase to reduce the potential for accidental pollution events and to provide a process to deal with any should they occur. This will include the development of a Code of Construction Practice (CoCP) which will set out measures to follow, published guidelines and best working practice for the prevention of pollution events. Adhering to such approaches means that significant effects on Annex I habitats or Annex II species are not anticipated – however, it is acknowledged that until these measures have been agreed, it is not possible to conclude no LSE.	Potential LSE		
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 				
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 				
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 				
		Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates 				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
	habitats. Offshore, there are also potential risks associated with deoxygenation.	Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise 	Although it is acknowledged that measures to prevent and manage the risk of accidental pollution have not yet been agreed, it is considered that these sites fall sufficiently distant from Thanet Extension that a conclusion of no LSE can be drawn.	No LSE
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twait shad • River lamprey • Sea lamprey 		
		Transboundary harbour porpoise sites (22 sites)		
		Transboundary harbour seal sites (7 sites)		
		Transboundary grey seal sites (10 sites)		
Increase in underwater noise	Construction activities, in particular the pile-driving of foundations, will result in high levels of underwater noise. Increased vessel traffic during construction may also result in increased noise levels.	Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twait shad • River lamprey • Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the distance between the designated site and potential source of underwater noise, it is considered that the potential for a significant effect to migratory fish is negligible.	No LSE
		Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise 	Thanet Extension is located within 0 km of the cSAC. There is potential for a significant effect.	Potential LSE
		Transboundary harbour porpoise sites (22 sites)	The range applied to UK harbour porpoise sites for Screening of effect is 26 km. Only one site falls within that range (Bancs de Flandres SCI, 23 km), with potential for significant effect limited to that site.	Potential for LSE (single site only)
		Transboundary harbour seal sites (7 sites)	All the designated sites fall in the foraging range of harbour seal, with potential for a significant effect.	Potential for LSE
		Transboundary grey seal sites (10 sites)	All the designated sites fall in the foraging range of grey seal, with potential for a significant effect.	Potential for LSE
Noise disturbance (onshore)	Noise based disturbance during construction	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and golden plover</p> <p>No LSE for little tern</p>

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates 	Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects. No potential for significant effect identified for wetland invertebrates.	Potential for LSE for turnstone No LSE for wetland invertebrates
		Stodmarsh SPA <ul style="list-style-type: none"> Great bittern (Non-breeding) Hen harrier (Non-breeding) Gadwall (Breeding) Gadwall (Non-breeding) Northern shoveler (Non-breeding) Waterbird assemblage Breeding bird assemblage 	The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any Zone of Influence (Zol), none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.	No LSE
		Stodmarsh Ramsar Ramsar Criterion 2: <ul style="list-style-type: none"> Six British Red Data Book wetland invertebrates; two nationally rare plants, five nationally scarce species; a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler- non-breeding and hen harrier – non-breeding) 		
		Stodmarsh SAC Annex II species that are a primary reason for selection of this site: <ul style="list-style-type: none"> Desmoulin`s whorl snail 	Designated species not considered sensitive to noise disturbance	No LSE
Spread of non-native, invasive species	There is a risk of spread of non-native invasive species, via accidental transport and release from sources including construction and installation vessels/ vehicles, machinery, construction products and from the construction process itself. The release of such non-native, invasive species may	Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 	A number of mitigation measures and best practice approaches will be implemented during the construction phase to reduce the potential for release and spread of non-native, invasive species and to provide a process to deal with any should they occur. This will include the development of a Code of Construction Practice (CoCP), an onshore CEMP (Construction environment Management Plan) and BMS (Biodiversity Mitigation Strategy) which will set out measures to follow published guidelines and best working practice for the prevention of the release and spread of non-native, invasive species.	Potential LSE

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
	lead to impacts on the species and habitats present resulting in reduced diversity, abundance and biomass.	Thanet coast SAC – <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 		
Visual disturbance (onshore)	Visual disturbance during construction	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and golden plover</p> <p>No LSE for little tern</p>
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding) 	<p>Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>No potential for significant effect identified for wetland invertebrates.</p>	<p>Potential for LSE for turnstone</p>
		Red Data Book wetland invertebrates		
		Stodmarsh SPA <ul style="list-style-type: none"> • Great bittern (Non-breeding) • Hen harrier (Non-breeding) • Gadwall (Breeding) • Gadwall (Non-breeding) • Northern shoveler (Non-breeding) • Waterbird assemblage • Breeding bird assemblage 	<p>The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any ZoI, none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.</p>	<p>No LSE</p>
Stodmarsh Ramsar Ramsar Criterion 2: <ul style="list-style-type: none"> • Six British Red Data Book wetland invertebrates; • two nationally rare plants, • five nationally scarce species; 				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		<ul style="list-style-type: none"> a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler- non-breeding and hen harrier – non-breeding) 		
		Stodmarsh SAC Annex II species that are a primary reason for selection of this site: <ul style="list-style-type: none"> Desmoulin`s whorl snail 	Designated species not considered sensitive to visual disturbance.	No LSE
Collision risk	The increased vessel traffic during construction may result in an increased collision risk to marine mammals.	Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise Transboundary harbour porpoise sites (22 sites) Transboundary harbour seal sites (7 sites) Transboundary grey seal sites (10 sites)	Given the high vessel density surrounding the project boundary the increase in vessel movements during construction is not considered significant. In addition, mitigation measures proposed on such project typically include requirements for vessel response to the presence of marine mammals, further reducing the risk of a potential collision. All sites designated for seals are located at least 24 km from Thanet Extension, with the risk of injury therefore considered low.	No LSE
Change in prey availability and behaviour	Changes in communities as a result of habitat disturbance/ loss, suspended sediment and smothering may result in reduced prey resource.	Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise Transboundary harbour porpoise sites (22 sites) Transboundary harbour seal sites (7 sites) Transboundary grey seal sites (10 sites) Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Little tern (Breeding) Outer Thames Estuary SPA <ul style="list-style-type: none"> Red-throated diver Alde-Ore Estuary SPA <ul style="list-style-type: none"> Lesser black-backed gull Alde-Ore Estuary Ramsar <ul style="list-style-type: none"> Lesser black-backed gull Foulness (Mid-Essex Coast Phase 5) SPA <ul style="list-style-type: none"> Sandwich tern 	Given large foraging ranges of the species concerned, the short term and temporary nature of any effect and conclusions of the PEIR regarding fish and benthic ecology, the potential for an effect is considered negligible.	No LSE

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE		
		Flamborough and Filey Coast pSPA <ul style="list-style-type: none"> Gannet, kittiwake, guillemot & razorbill 				
		Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> Kittiwake 				
		St Abb’s Head to Fast Castle SPA <ul style="list-style-type: none"> Kittiwake, herring gull, guillemot & razorbill 				
Direct disturbance and displacement (offshore)	Potential for disturbance and displacement of species will be species dependant, but up to 4 – 6 km for the most sensitive species.	Outer Thames Estuary SPA <ul style="list-style-type: none"> Red-throated diver 	Displacement extent of named species could extend to distance between Thanet Extension and SPA.	Potential for LSE in named species		
		Flamborough and Filey Coast pSPA Potential for direct disturbance and displacement for guillemot and razorbill, not for gannet and kittiwake (drawing on experience from post-construction studies at operating OWFs)				
		St Abb’s Head to Fast Castle SPA Potential for direct disturbance and displacement for guillemot and razorbill, not for herring gull and kittiwake (drawing on experience from post-construction studies at operating OWFs)				
				Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> Kittiwake 	No potential for displacement or disturbance identified.	No LSE
			Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Little tern (Breeding) 			
			Alde-Ore Estuary SPA <ul style="list-style-type: none"> Lesser black-backed gull 			
			Foulness (Mid-Essex Coast Phase 5) SPA <ul style="list-style-type: none"> Sandwich tern 			
Operation and Maintenance						
Physical loss of habitat	Offshore, the footprint/ presence of structures (i.e. WTGs, substations, possible scour protection and	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential for overlap between Annex I habitats offshore (reefs) and cable corridor. Intertidally, the potential for habitat loss will be linked to the installation methods, with different installation methods currently being explored.	Potential LSE		
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes 				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
	permanent moorings) will reduce the area of available habitat. Onshore, habitat loss relates to the potential for a permanent or temporary loss of use of habitat during maintenance (designated habitat and/ or functionally connected habitat), in addition to any permanent habitat loss of a designated site already occurring as a result of construction.	<ul style="list-style-type: none"> Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 		
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	Potential for overlap between supporting intertidal habitats and project structures and cable corridor.	Potential LSE
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 	Potential for overlap between supporting intertidal habitats and project structures and cable corridor.	Potential LSE
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 	No potential for overlap with Annex I features, given the distance from the project.	No LSE
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of long term physical loss of habitat (i.e. within the project boundary) associated with the construction of the project (up to 10 km) it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 	The cSAC extends for some 36,951km ² , with the combined habitat loss of seabed habitat (including WTG foundations, all cable protection, all cable crossings, defined in Table 5.10 of the PEIR) totals approximately 0.35km ² , not all of which will fall within the cSAC. This equates to approximately 0.001% of the cSAC. The potential for a significant effect is considered to be negligible.	No LSE
EMF	There is potential for EMF to affect benthic habitats.	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential for overlap with subtidal features only (Annex 1 reefs).	Potential LSE
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	Given the proposed construction methods for the relevant section of the cable route, no potential for overlap with designated features or the supporting habitat of designated species.	No LSE
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 		
		Sandwich Bay SAC <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) 		

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		<ul style="list-style-type: none"> Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 		
Temporary habitat disturbance	The impacts are likely to be similar to those for construction but the magnitude will be less. The frequency and duration of these impacts will be determined by the O&M requirements of the site.	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential significant overlap with Annex I habitats (reefs). Given the baseline vessel traffic in the vicinity it is likely that damage from anchors will be negligible.	Potential LSE
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 	Given the distance between the project and the SAC, no potential for overlap with Annex I habitats.	No LSE
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Potential overlap with Annex I habitats or supporting intertidal habitats.	Potential LSE
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 		
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 		
Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of physical effects associated with the construction of the project (up to 10 km) it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE		
Release of sediment into suspension, with subsequent deposition.	Should scour occur at the site, this would result in a release of suspended sediment into the water column. Re-deposition of sediments out of the water column may result in smothering of benthic prey species. However, the degree of sediment disturbance will be much reduced when compared to the construction phase.	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Minor amounts of sediment may be released into suspension, with subsequent deposition, during the operation and maintenance phase. Although such quantities are typically like to be small, localised and intermittent, should cable repairs be required, there is potential for further sediment to be released, with Annex I habitats, or habitats supporting SPA/ Ramsar site qualifying features, potentially being within the range of effect.	Potential LSE
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 		
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 		
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 		
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad 	Minor amounts of sediment may be released into suspension, with subsequent deposition, during the operation and maintenance phase.	No LSE

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		<ul style="list-style-type: none"> River lamprey Sea lamprey 	Such quantities are like to be small, localised and intermittent and are not considered to be of significance.	
Change in prey availability and behaviour	Changes in the benthic and fish communities resulting from O&M activities may lead to a change or loss of prey resources for marine mammals and fish. Feeding areas may also be reduced as a result of physical barriers.	Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise Transboundary harbour porpoise sites (22 sites) Transboundary harbour seal sites (7 sites) Transboundary grey seal sites (10 sites) Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Little tern (Breeding) Outer Thames Estuary SPA <ul style="list-style-type: none"> Red-throated diver Alde-Ore Estuary SPA <ul style="list-style-type: none"> Lesser black-backed gull Alde-Ore Estuary Ramsar <ul style="list-style-type: none"> Lesser black-backed gull Foulness (Mid-Essex Coast Phase 5) SPA <ul style="list-style-type: none"> Sandwich tern Flamborough and Filey Coast pSPA <ul style="list-style-type: none"> Gannet, kittiwake, guillemot & razorbill Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> Kittiwake St Abb's Head to Fast Castle SPA <ul style="list-style-type: none"> Kittiwake, herring gull, guillemot & razorbill 	Given large foraging ranges and conclusions of the PEIR regarding fish and benthic ecology it is not likely to cause long term detrimental effects.	No LSE
Changes to physical processes	The presence of manmade structures such as scour protection and foundations may result in localised changes in hydrodynamics and wave regimes. Therefore, as a	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) Thanet Coast & Sandwich Bay Ramsar	Potential for overlap between Annex I habitats/ or habitats supporting SPA/ Ramsar site qualifying features and relevant range of effect. Any potential change in physical processes is likely to be localised and small scale. Further information will be available to assess this from the physical processes chapter in the PEIR.	Potential LSE (to be revisited once the PEIR is finished)

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE		
	secondary affect the sediment transport pathways may be altered.	Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 				
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 				
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 			Habitat features located above high water and therefore no potential for link to any change in physical processes.	No LSE
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twaite shad River lamprey Sea lamprey 			The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the localised nature of any change in physical processes, it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE
Accidental pollution	There is a risk of pollution being accidentally released from sources including construction and installation vessels/ vehicles, machinery and offshore fuel storage tanks and from the construction process itself. The release of such contaminants may lead to impacts on the species or habitats present, through toxic effects resulting in reduced diversity, abundance and biomass. Offshore, there are also potential risks associated with deoxygenation and a change in temperature (the latter in relation to the cable).	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	A number of mitigation measures and best practice approaches will be implemented during the construction phase to reduce the potential for accidental pollution events and to provide a process to deal with any should they occur. This will include the development of a Code of Construction Practice (CoCP) which will set out measures to follow, published guidelines and best working practice for the prevention of pollution events. Adhering to such approaches means that significant effects on Annex I habitats or Annex II species are not anticipated – however, it is acknowledged that until these measures have been agreed, it is not possible to conclude no LSE.	Potential LSE		
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 				
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 				
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 				
		Thanet Coast & Sandwich Bay Ramsar <p>Ramsar Criterion 6 - Species/ populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 				
		Red Data Book wetland invertebrates				
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 				
	Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twaite shad 	Although it is acknowledged that measures to prevent and manage the risk of accidental pollution have not yet been agreed, it is considered that	No LSE			

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		<ul style="list-style-type: none"> River lamprey Sea lamprey 	these sites fall sufficiently distant from Thanet Extension that a conclusion of no LSE can be drawn.	
		Transboundary harbour porpoise sites (22 sites)		
		Transboundary harbour seal sites (7 sites)		
		Transboundary grey seal sites (10 sites)		
Underwater noise	Increased underwater noise from the operational WTGs and increased vessel activity for O&M operations.	Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twaite shad River lamprey Sea lamprey 	Operational noise associated with WTGs is low and localised, with no potential for a significant effect identified. Regarding operational and maintenance vessel traffic noise, Thanet Extension is located in an extremely busy shipping area, with the increase in shipping for the project being negligible in comparison. No adverse effect has been identified.	No LSE
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 		No LSE
		Transboundary harbour porpoise sites (22 sites)		
		Transboundary harbour seal sites (7 sites)		
		Transboundary grey seal sites (10 sites)		
Noise disturbance (onshore)	Noise based disturbance during operational maintenance.	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	Ruddy turnstone: given the presence of this species within the intertidal/onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects. Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE. Golden plover - given the presence of this species within the intertidal/onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.	Potential for LSE for ruddy turnstone and golden plover No LSE for little tern
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates	Turnstone: given the presence of this species within the intertidal/onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects. No potential for significant effect identified for wetland invertebrates.	Potential for LSE for turnstone

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		<p>Stodmarsh SPA</p> <ul style="list-style-type: none"> • Great bittern (Non-breeding) • Hen harrier (Non-breeding) • Gadwall (Breeding) • Gadwall (Non-breeding) • Northern shoveler (Non-breeding) • Waterbird assemblage • Breeding bird assemblage 	<p>The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any Zol, none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.</p>	<p>No LSE</p>
		<p>Stodmarsh Ramsar</p> <p><i>Ramsar Criterion 2:</i></p> <ul style="list-style-type: none"> • Six British Red Data Book wetland invertebrates; • two nationally rare plants, • five nationally scarce species; • a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler- non-breeding and hen harrier – non-breeding) 		
		<p>Stodmarsh SAC</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Desmoulin`s whorl snail 	<p>Designated species not considered sensitive to noise disturbance as the SAC lies approximately 9 km from the onshore extent of the Thanet Extension.</p>	<p>No LSE</p>
<p>Visual disturbance (onshore)</p>	<p>Visual disturbance during operational maintenance.</p>	<p>Thanet Coast & Sandwich Bay SPA</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and golden plover</p> <p>No LSE for little tern</p>
		<p>Thanet Coast & Sandwich Bay Ramsar</p> <p>Ramsar Criterion 6 - Species/ populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding) 	<p>Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for turnstone</p>

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		Red Data Book wetland invertebrates	No potential for significant effect identified for wetland invertebrates.	
		Stodmarsh SPA <ul style="list-style-type: none"> • Great bittern (Non-breeding) • Hen harrier (Non-breeding) • Gadwall (Breeding) • Gadwall (Non-breeding) • Northern shoveler (Non-breeding) • Waterbird assemblage • Breeding bird assemblage 	The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any ZoI, none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.	No LSE
		Stodmarsh Ramsar <i>Ramsar Criterion 2:</i> <ul style="list-style-type: none"> • Six British Red Data Book wetland invertebrates; • two nationally rare plants, • five nationally scarce species; • a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler- non-breeding and hen harrier – non-breeding) 		
		Stodmarsh SAC Annex II species that are a primary reason for selection of this site: <ul style="list-style-type: none"> • Desmoulin’s whorl snail 	Designated species not considered sensitive to visual disturbance	No LSE
Introduction of hard substrate	It is likely that the manmade structures placed on the seabed will be colonised by a range of marine species resulting in a localised increase in biodiversity. These structures also have the potential to act as artificial reefs however they may also facilitate the spread of non-native species.	Thanet coast SAC – <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	Potential for overlap between Annex I habitats and project structures (depending on cable burial method). There is the potential for positive effects on the site through increased biodiversity. Given the presence of TOWF and other local OWFs, the potential for non-native species to occur is already present.	Potential LSE
		Margate and Long Sands SAC – <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. 	Annex I habitats located within range of relevant physical effect and there is potential for effect from non-native species.	Potential LSE
		Sandwich Bay SAC – <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Habitat features located above high water and therefore no potential for link to subtidal marine non native species.	No LSE
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twaite shad • River lamprey • Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the localised nature the additional hard structures, it is considered that the potential for a significant effect to the SAC is negligible.	No LSE
Collision risk	The increased vessel traffic during O&M may	Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise 	Given the high vessel density surrounding the project boundary the increase in vessel movements during operation and maintenance is not	No LSE

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
	results in an increased collision risk to marine mammals.	Transboundary harbour porpoise sites (22 sites)	considered significant. In addition, mitigation measures proposed on such projects typically include requirements for vessel response to the presence of marine mammals, further reducing the risk of a potential collision. All sites designated for seals are located at least 24 km from Thanet Extension, with the risk of injury therefore considered low.	
		Transboundary harbour seal sites (7 sites)		
		Transboundary grey seal sites (10 sites)		
Direct disturbance and displacement (offshore)	Potential for disturbance and species will be species dependant, but up to 4-6 km for the most sensitive species.	Outer Thames Estuary SPA • Red-throated diver	Displacement extent of named species could extend to distance between Thanet Extension and SPA.	Potential for LSE in named species
		Flamborough and Filey Coast pSPA • Guillemot, razorbill		
		St Abb’s Head to Fast Castle SPA • Guillemot, razorbill (not kittiwake or herring gull)		
		Thanet Coast & Sandwich Bay SPA • Little tern (Breeding);	No potential for displacement or disturbance identified.	No LSE
		Alde-Ore Estuary SPA • Lesser black-backed gull		
		Alde-Ore Estuary Ramsar • Lesser black-backed gull		
		Foulness (Mid-Essex Coast Phase 5) SPA • Sandwich tern		
Flamborough Head and Bempton Cliffs SPA • Kittiwake				
Collision risk	Modelling of collision risk and post-construction studies at operating OWFs.	Foulness (Mid-Essex Coast Phase 5) SPA • Sandwich tern	Scale of collision mortality predicted might result in population decline in named species.	Potential for LSE in named species [screening to be refined when the
		Alde-Ore Estuary SPA • Lesser black-backed gull		

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE
		Alde-Ore Estuary Ramsar <ul style="list-style-type: none"> • Lesser black-backed gull 	No likely significant effect anticipated.	quantitative CRM outputs from the MSExcels based Band 2012 model become available]
		Flamborough and Filey Coast pSPA <ul style="list-style-type: none"> • Gannet, kittiwake (not guillemot and razorbill) 		
		Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> • Kittiwake 		
		Outer Thames Estuary SPA <ul style="list-style-type: none"> • Red-throated diver 		No LSE
		St Abb's Head to Fast Castle SPA <ul style="list-style-type: none"> • Guillemot, razorbill 		
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Little tern (Breeding) 		
Barrier effect	Post-construction studies at operating OWFs.	[none]	Barrier effect not assessed as significant.	No LSE
Decommissioning				
The potential for LSE during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase.				

9 In-combination Assessment

9.1.1 Regulation 61 of the Habitats Regulations requires the competent authority to assess any plans or projects which are likely to have a significant effect on a European site, whether alone or ‘in-combination’ with other plans or projects.

9.1.2 The scope of the in-combination test to ‘other plans or projects’ will include:

- Permitted ongoing activities, such as discharge consents and abstraction licences;
- Approved or consented plans which have not yet been completed;
- Plans and projects where the application for consent has been submitted but has not yet been approved by the competent authorities; and
- Plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development being assessed and which sufficient information is available to adequately assess the likelihood of cumulative and in-combination effects.

9.1.3 The search criteria, in terms of distance, for offshore and onshore projects which will be used in the RIAA are outlined in Table 9.1 and Table 9.2 respectively. These search criteria are the same as those being applied in the EIA to generate a list of projects to be considered. Subsequently the following Screening criteria will be applied to generate a list of plans and projects to be considered in terms of in-combination effects. The developed list of proposed projects to consider will be developed and discussed with SNCBs.

9.1.4 The proposed criteria are:

- Screened out of the in-combination assessment because:
 - Project, plan or activity included as part of the baseline (therefore not considered in the in-combination assessment);
 - Low data confidence;
 - No conceptual effect-receptor pathway exists;
 - No physical effect-receptor overlap; or
 - No temporal overlap.
- Screened into the in-combination assessment because:
 - Project, plan or activity considered as part of the baseline but has ongoing effects; or
 - There is a potential for a cumulative impact to occur.

9.1.5 A full assessment of in-combination effects will be undertaken as part of the RIAA and therefore is not presented in this Report.

Table 9.1: Search criteria for offshore projects and plans to be incorporated into Appropriate Assessment.

Project, Plan or Activity Type	CEA Search Area Extent
Aggregate and disposal	Up to 50 km from the Thanet Extension array area and offshore export cable corridor
Offshore energy	Up to 500 km from the Thanet Extension array area and offshore export cable corridor
Commercial fisheries	Up to 200 km from the Thanet Extension array area and offshore export cable corridor
Oil and gas	Up to 200 km from the Thanet Extension array area and offshore export cable corridor
Cables and pipelines	Up to 50 km from the Thanet Extension array area and offshore export cable corridor
Shipping	Up to 200 km from the Thanet Extension array area and offshore export cable corridor
Military, aviation and radar	Up to 200 km from the Thanet Extension array area and offshore export cable corridor
Coastal	Up to 200 km from the Thanet Extension array area and offshore export cable corridor

Table 9.2: Search criteria for onshore projects and plans to be incorporated into Appropriate Assessment.

Project Component	CEA Search Area Extent
Landfall	Up to 5 km from the landfall areas
Onshore export cable corridor	Up to 5 km from the cable corridor (including inside)

10 References

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Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

HRA Screening – Appendix I

June 2018, Revision A

Document Reference: 5.2.1

Pursuant to: APFP Reg. 5(2)(g)



Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm
Annex 5.2.1: HRA Screening – Appendix I
June 2018

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The following table presents a review of the original Screening undertaken for Thanet Extension and presented in the original screening report in 2017. Following that original screening, only those effects that were screened in for LSE were taken forward into the Report to Inform Appropriate Assessment. The purpose of the table is to revisit that original screening, to confirm that all effects originally screened out for LSE remain screened out for LSE post Sweetman II. The table below confirms that original screening. It should be noted that the conclusions of the screening presented below, ie the effects screened in for LSE, have been taken forward to the RIAA for further consideration of LSE. That further consideration is based on progress made following the original screening and has also been revisited post Sweetman II.

Table 1: Updated Screening following ECJ Ruling (Sweetman II)

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Construction						
Habitat loss and habitat disturbance	<p>Offshore, there is potential for temporary, direct habitat loss and disturbance due to cable laying operations (including anchor placements), foundation installations and seabed preparation.</p> <p>Onshore, habitat loss relates to: the (temporary or long term) loss/ degradation of habitats where these are a designated site interest feature in their own right; loss of use of functionally connected habitats; where such loss/ degradation would have an indirect, detrimental effect on species interest features; and temporary habitat fragmentation and species isolation.</p>	<p>Thanet coast SAC –</p> <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	Potential physical overlap with Annex I habitat (reefs). Where possible, cable route will be micro-routed to avoid features present. Given the baseline vessel traffic in the vicinity it is likely that damage from anchors will be negligible.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		<p>Margate and Long Sands SAC –</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. 	No potential overlap with Annex I habitats, given their location compared to the project.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		<p>Sandwich Bay SAC –</p> <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Potential overlap with Annex I habitats. The feasibility of different installation methods are currently being explored, a potential mitigation may be to HDD below the features.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		<p>Thanet Coast & Sandwich Bay SPA</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	Potential loss of habitat from the designated site and the potential for a temporary loss of use of functionally connected habitats.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates 	Potential loss of habitat from the designated site and the potential for a temporary loss of use of functionally connected habitats.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of physical effects associated with the construction of the project (up to 10 km) it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman
Temporary increases in suspended sediment concentrations, deposition of sediments and smothering.	Increased suspended sediment concentrations may arise due to cable laying operations (including anchor placements), foundation installations and seabed preparation. Increased sediment deposition will occur as sediments settle out of the water column.	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential overlap between Annex I habitats (reefs) and the defined Screening buffer of increased suspended sediments.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 	Potential for the defined Screening buffer of increased suspended sediments to overlap with Annex I habitats/ habitats supporting SPA/ Ramsar site qualifying features.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) 				
		Sandwich Bay SAC <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Terrestrial habitats therefore no potential for LSE from suspended sediment and subsequent deposition.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of a potential increase in suspended sediment (up to 10 km) it is considered that the potential for a significant effect to migratory fish is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 	Harbour porpoise occur naturally in turbid environments, with the potential level, extent and duration of any increase in suspended sediment (and subsequent deposition) being negligible as regards the ecology of the species and the extent of the cSAC.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Transboundary harbour porpoise sites (22 sites)	Marine mammals occur naturally in turbid environments, with the potential level, extent and duration of any increase in suspended sediment (and subsequent deposition) being	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Transboundary harbour seal sites (7 sites)	negligible as regards the ecology of the species and the proximity of the designated sites (24 km as a minimum).	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Transboundary grey seal sites (10 sites)		No LSE	No	LSE conclusion remains unchanged post Sweetman
Accidental pollution	There is a risk of pollution being accidentally released from sources including construction and installation vessels/ vehicles, machinery and offshore fuel storage tanks and from the construction process itself. The release of such contaminants may lead to impacts on the species present, through toxic effects resulting in reduced diversity, abundance and biomass, but also through degradation of habitats. Offshore, there are also potential risks associated with deoxygenation.	<p>Thanet coast SAC –</p> <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves <p>Margate and Long Sands SAC –</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. <p>Sandwich Bay SAC –</p> <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) <p>Thanet Coast & Sandwich Bay SPA</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	A number of mitigation measures and best practice approaches will be implemented during the construction phase to reduce the potential for accidental pollution events and to provide a process to deal with any should they occur. This will include the development of a Code of Construction Practice (CoCP) which will set out measures to follow, published guidelines and best working practice for the prevention of pollution events. Adhering to such approaches means that significant effects on Annex I habitats or Annex II species are not anticipated – however, it is acknowledged that until these measures have been agreed, it is not possible to conclude no LSE.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Thanet Coast & Sandwich Bay Ramsar <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates 				
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 				
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	Although it is acknowledged that measures to prevent and manage the risk of accidental pollution have not yet been agreed, it is considered that these sites fall sufficiently distant from Thanet Extension that a conclusion of no LSE can be drawn.	No LSE	No	LSE conclusion remains unchanged post Sweetman
	Transboundary harbour porpoise sites (22 sites)					
	Transboundary harbour seal sites (7 sites)					
	Transboundary grey seal sites (10 sites)					
Increase in underwater noise	Construction activities, in particular the pile-driving of foundations, will result in high levels of underwater noise. Increased vessel traffic during construction may also result in increased noise levels.	Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the distance between the designated site and potential source of underwater noise, it is considered that the potential for a significant effect to migratory fish is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 	Thanet Extension is located within 0 km of the cSAC. There is potential for a significant effect.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Transboundary harbour porpoise sites (22 sites)	The range applied to UK harbour porpoise sites for Screening of effect is 26 km. Only one site falls within that range (Bancs de Flandres SCI, 23 km), with potential for significant effect limited to that site.	Potential for LSE (single site only)	N/A	LSE conclusion remains unchanged post Sweetman
		Transboundary harbour seal sites (7 sites)	All the designated sites fall in the foraging range of harbour seal, with potential for a significant effect.	Potential for LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Transboundary grey seal sites (10 sites)	All the designated sites fall in the foraging range of grey seal, with potential for a significant effect.	Potential for LSE	N/A	LSE conclusion remains unchanged post Sweetman
Noise disturbance (onshore)	Noise based disturbance during construction	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and European golden plover</p> <p>No LSE for little tern</p>	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		<p>Thanet Coast & Sandwich Bay Ramsar</p> <ul style="list-style-type: none"> Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates 	<p>Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>No potential for significant effect identified for wetland invertebrates.</p>	<p>Potential for LSE for ruddy turnstone</p> <p>No LSE for wetland invertebrates</p>	N/A	LSE conclusion remains unchanged post Sweetman
		<p>Stodmarsh SPA</p> <ul style="list-style-type: none"> Great bittern (Non-breeding) Hen harrier (Non-breeding) Gadwall (Breeding) Gadwall (Non-breeding) Northern shoveler (Non-breeding) Waterbird assemblage Breeding bird assemblage 	<p>The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any Zone of Influence (Zol), none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.</p>	No LSE	N/A	LSE conclusion remains unchanged post Sweetman
		<p>Stodmarsh Ramsar</p> <p>Ramsar Criterion 2:</p> <ul style="list-style-type: none"> Six British Red Data Book wetland invertebrates; two nationally rare plants, five nationally scarce species; a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler – non-breeding and hen harrier – non-breeding) 			N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		<p>Stodmarsh SAC</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Desmoulin`s whorl snail 	Designated species not considered sensitive to noise disturbance	No LSE	N/A	LSE conclusion remains unchanged post Sweetman
Spread of non-native, invasive species	There is a risk of spread of non-native invasive species, via accidental transport and release from sources including construction and installation vessels/ vehicles, machinery, construction products and from the construction process itself. The release of such non-native, invasive species may lead to impacts on the species and habitats present resulting in reduced diversity, abundance and biomass.	<p>Sandwich Bay SAC –</p> <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) <p>Thanet Coast & Sandwich Bay SPA</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) <p>Thanet Coast & Sandwich Bay Ramsar</p> <p>Ramsar Criterion 6 - Species/ populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding) <p>Thanet coast SAC –</p> <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	<p>A number of mitigation measures and best practice approaches will be implemented during the construction phase to reduce the potential for release and spread of non-native, invasive species and to provide a process to deal with any should they occur. This will include the development of a Code of Construction Practice (CoCP), an onshore CEMP (Construction environment Management Plan) and BMS (Biodiversity Mitigation Strategy) which will set out measures to follow published guidelines and best working practice for the prevention of the release and spread of non-native, invasive species.</p>	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Visual disturbance (onshore)	Visual disturbance during construction	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and European golden plover</p> <p>No LSE for little tern</p>	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates	<p>Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>No potential for significant effect identified for wetland invertebrates.</p>	<p>Potential for LSE for ruddy turnstone</p>	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		<p>Stodmarsh SPA</p> <ul style="list-style-type: none"> • Great bittern (Non-breeding) • Hen harrier (Non-breeding) • Gadwall (Breeding) • Gadwall (Non-breeding) • Northern shoveler (Non-breeding) • Waterbird assemblage • Breeding bird assemblage 	<p>The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any ZOI, none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.</p>	No LSE	N/A	LSE conclusion remains unchanged post Sweetman
	<p>Stodmarsh Ramsar</p> <p>Ramsar Criterion 2:</p> <ul style="list-style-type: none"> • Six British Red Data Book wetland invertebrates; • two nationally rare plants, • five nationally scarce species; • a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler – non-breeding and hen harrier – non-breeding) 	N/A			LSE conclusion remains unchanged post Sweetman	
	<p>Stodmarsh SAC</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Desmoulin`s whorl snail 	Designated species not considered sensitive to visual disturbance.			No LSE	N/A
Collision risk	The increased vessel traffic during construction may result in an	<p>Southern North Sea cSAC</p> <ul style="list-style-type: none"> • Harbour porpoise 	Given the high vessel density surrounding the project boundary the increase in vessel	No LSE	No	LSE conclusion remains

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
	increased collision risk to marine mammals.	Transboundary harbour porpoise sites (22 sites) Transboundary harbour seal sites (7 sites) Transboundary grey seal sites (10 sites)	movements during construction is not considered significant. In addition. All sites designated for seals are located at least 24 km from Thanet Extension, with the risk of injury therefore considered low.			unchanged post Sweetman
Change in prey availability and behaviour	Changes in communities as a result of habitat disturbance/ loss, suspended sediment and smothering may result in reduced prey resource.	Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise Transboundary harbour porpoise sites (22 sites) Transboundary harbour seal sites (7 sites) Transboundary grey seal sites (10 sites) Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Little tern (Breeding) Outer Thames Estuary SPA <ul style="list-style-type: none"> Red-throated diver Alde-Ore Estuary SPA <ul style="list-style-type: none"> Lesser black-backed gull Alde-Ore Estuary Ramsar <ul style="list-style-type: none"> Lesser black-backed gull Foulness (Mid-Essex Coast Phase 5) SPA <ul style="list-style-type: none"> Sandwich tern Flamborough and Filey Coast pSPA <ul style="list-style-type: none"> Gannet, kittiwake, guillemot & razorbill 	Given large foraging ranges of the species concerned, the short term and temporary nature of any effect and conclusions of the PEIR regarding fish and benthic ecology, the potential for an effect is considered negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> Kittiwake 				
		St Abb’s Head to Fast Castle SPA <ul style="list-style-type: none"> Kittiwake, herring gull, guillemot & razorbill 				
Direct disturbance and displacement (offshore)	Potential for disturbance and displacement of species will be species dependant, but up to 4 – 6 km for the most sensitive species.	Outer Thames Estuary SPA <ul style="list-style-type: none"> Red-throated diver 	Displacement extent of named species could extend to distance between Thanet Extension and SPA.	Potential for LSE in named species	N/A	LSE conclusion remains unchanged post Sweetman
		Flamborough and Filey Coast pSPA Potential for direct disturbance and displacement for guillemot and razorbill, not for gannet and kittiwake (drawing on experience from post-construction studies at operating OWFs)				
		St Abb’s Head to Fast Castle SPA Potential for direct disturbance and displacement for guillemot and razorbill, not for herring gull and kittiwake (drawing on experience from post-construction studies at operating OWFs)				
		Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> Kittiwake 	No potential for displacement or disturbance identified.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Little tern (Breeding) 				
		Alde-Ore Estuary SPA <ul style="list-style-type: none"> Lesser black-backed gull 				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Foulness (Mid-Essex Coast Phase 5) SPA <ul style="list-style-type: none"> Sandwich tern 				
Operation and Maintenance						
Physical loss of habitat	<p>Offshore, the footprint/ presence of structures (i.e. WTGs, substations, possible scour protection and permanent moorings) will reduce the area of available habitat.</p> <p>Onshore, habitat loss relates to the potential for a permanent or temporary loss of use of habitat during maintenance (designated habitat and/ or functionally connected habitat), in addition to any permanent habitat loss of a designated site already occurring as a result of construction.</p>	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential for overlap between Annex I habitats offshore (reefs) and cable corridor. Intertidally, the potential for habitat loss will be linked to the installation methods, with different installation methods currently being explored.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 				
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	Potential for overlap between supporting intertidal habitats and project structures and cable corridor.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 	Potential for overlap between supporting intertidal habitats and project structures and cable corridor.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 	No potential for overlap with Annex I features, given the distance from the project.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of long term physical loss of habitat (i.e. within the project boundary) associated with the construction of the project (up to 10 km) it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Southern North Sea cSAC <ul style="list-style-type: none"> Harbour porpoise 	The cSAC extends for some 36,951km ² , with the combined habitat loss of seabed habitat (including WTG foundations, all cable protection, all cable crossings, defined in Table 5.10 of the PEIR) totals approximately 0.35km ² , not all of which will fall within the cSAC. This equates to approximately 0.001% of the cSAC. The potential for a significant effect is considered to be negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman
EMF	There is potential for EMF to affect benthic habitats.	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential for overlap with subtidal features only (Annex 1 reefs).	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	Given the proposed construction methods for the relevant section of the cable route, no potential for overlap with designated features or the supporting habitat of designated species.	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		<p>Thanet Coast & Sandwich Bay Ramsar</p> <p>Ramsar Criterion 6 - Species/ populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 				
		<p>Sandwich Bay SAC</p> <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 				
Temporary habitat disturbance	The impacts are likely to be similar to those for construction but the magnitude will be less. The frequency and duration of these impacts will be determined by the O&M requirements of the site.	<p>Thanet coast SAC –</p> <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential significant overlap with Annex I habitats (reefs). Given the baseline vessel traffic in the vicinity it is likely that damage from anchors will be negligible.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		<p>Margate and Long Sands SAC –</p> <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 	Given the distance between the project and the SAC, no potential for overlap with Annex I habitats.	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		<p>Sandwich Bay SAC –</p> <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Potential overlap with Annex I habitats or supporting intertidal habitats.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
	<p>Thanet Coast & Sandwich Bay SPA</p> <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 					
	<p>Thanet Coast & Sandwich Bay Ramsar</p> <p>Ramsar Criterion 6 - Species/ populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 					
		<p>Vlaamse Banken relevant species:</p> <ul style="list-style-type: none"> Twait shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the extent of physical effects associated with the construction of the project (up to 10 km) it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Release of sediment into suspension, with subsequent deposition.	Should scour occur at the site, this would result in a release of suspended sediment into the water column. Re-deposition of sediments out of the water column may result in smothering of benthic prey species. However, the degree of sediment disturbance will be much reduced when compared to the construction phase.	Thanet coast SAC – <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	Minor amounts of sediment may be released into suspension, with subsequent deposition, during the operation and maintenance phase. Although such quantities are typically like to be small, localised and intermittent, should cable repairs be required, there is potential for further sediment to be released, with Annex I habitats, or habitats supporting SPA/ Ramsar site qualifying features, potentially being within the range of effect.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) 				
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding) 				
		Margate and Long Sands SAC – <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. 				
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twait shad • River lamprey • Sea lamprey 	Minor amounts of sediment may be released into suspension, with subsequent deposition, during the operation and maintenance phase. Such quantities are like to be small, localised and intermittent and are not considered to be of significance.	No LSE	No	LSE conclusion remains unchanged post Sweetman
Change in prey availability and behaviour	Changes in the benthic and fish communities resulting from O&M activities may lead to a change or loss of prey resources for marine mammals and fish. Feeding areas may also be reduced as a result of physical barriers.	Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise 	Given large foraging ranges and conclusions of the PEIR regarding fish and benthic ecology it is not likely to cause long term detrimental effects.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Transboundary harbour porpoise sites (22 sites)				
		Transboundary harbour seal sites (7 sites)				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Transboundary grey seal sites (10 sites) Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Little tern (Breeding) Outer Thames Estuary SPA <ul style="list-style-type: none"> Red-throated diver Alde-Ore Estuary SPA <ul style="list-style-type: none"> Lesser black-backed gull Alde-Ore Estuary Ramsar <ul style="list-style-type: none"> Lesser black-backed gull Foulness (Mid-Essex Coast Phase 5) SPA <ul style="list-style-type: none"> Sandwich tern Flamborough and Filey Coast pSPA <ul style="list-style-type: none"> Gannet, kittiwake, guillemot & razorbill Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> Kittiwake St Abb’s Head to Fast Castle SPA <ul style="list-style-type: none"> Kittiwake, herring gull, guillemot & razorbill 				
Changes to physical processes	The presence of manmade structures such as scour protection and foundations may result in localised changes in hydrodynamics and wave regimes. Therefore, as a	Thanet coast SAC – <ul style="list-style-type: none"> Reefs Submerged or partially submerged sea caves 	Potential for overlap between Annex I habitats/ or habitats supporting SPA/ Ramsar site qualifying features and relevant range of effect. Any potential change in physical processes is likely to be localised and small scale. Further	Potential LSE (to be revisited once the PEIR is finished)	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
	secondary affect the sediment transport pathways may be altered.	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	information will be available to assess this from the physical processes chapter in the PEIR.			
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) 				
		Margate and Long Sands SAC – <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time. 				
		Sandwich Bay SAC – <ul style="list-style-type: none"> Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Habitat features located above high water and therefore no potential for link to any change in physical processes.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> Twaite shad River lamprey Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the localised nature of any change in physical processes, it is considered that the potential for a significant effect to the habitats of the migratory fish is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Accidental pollution	There is a risk of pollution being accidentally released from sources including construction and installation vessels/ vehicles, machinery and offshore fuel storage tanks and from the construction process itself. The release of such contaminants may lead to impacts on the species or habitats present, through toxic effects resulting in reduced diversity, abundance and biomass. Offshore, there are also potential risks associated with deoxygenation and a change in temperature (the latter in relation to the cable).	<p>Thanet coast SAC –</p> <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves <p>Margate and Long Sands SAC –</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. <p>Sandwich Bay SAC –</p> <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) <p>Thanet Coast & Sandwich Bay SPA</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding); • Little tern (Breeding); • European golden plover (Non-breeding) <p>Thanet Coast & Sandwich Bay Ramsar</p> <p>Ramsar Criterion 6 - Species/ populations occurring at levels of international importance:</p> <ul style="list-style-type: none"> • Ruddy turnstone (Non-breeding) <p>Red Data Book wetland invertebrates</p>	A number of mitigation measures and best practice approaches will be implemented during the construction phase to reduce the potential for accidental pollution events and to provide a process to deal with any should they occur. This will include the development of a Code of Construction Practice (CoCP) which will set out measures to follow, published guidelines and best working practice for the prevention of pollution events. Adhering to such approaches means that significant effects on Annex I habitats or Annex II species are not anticipated – however, it is acknowledged that until these measures have been agreed, it is not possible to conclude no LSE.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise 	<p>Although it is acknowledged that measures to prevent and manage the risk of accidental pollution have not yet been agreed, it is considered that these sites fall sufficiently distant from Thanet Extension that a conclusion of no LSE can be drawn.</p>	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twaite shad • River lamprey • Sea lamprey 				
		Transboundary harbour porpoise sites (22 sites)				
		Transboundary harbour seal sites (7 sites)				
		Transboundary grey seal sites (10 sites)				
Underwater noise	Increased underwater noise from the operational WTGs and increased vessel activity for O&M operations.	Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twaite shad • River lamprey • Sea lamprey 	<p>Operational noise associated with WTGs is low and localised, with no potential for a significant effect identified.</p> <p>Regarding operational and maintenance vessel traffic noise, Thanet Extension is located in an extremely busy shipping area, with the increase in shipping for the project being negligible in comparison. No adverse effect has been identified.</p>	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise 				
		Transboundary harbour porpoise sites (22 sites)				
		Transboundary harbour seal sites (7 sites)				
		Transboundary grey seal sites (10 sites)				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Noise disturbance (onshore)	Noise based disturbance during operational maintenance.	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and European golden plover</p> <p>No LSE for little tern</p>	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates	<p>Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>No potential for significant effect identified for wetland invertebrates.</p>	<p>Potential for LSE for ruddy turnstone</p>	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman		
		<p>Stodmarsh SPA</p> <ul style="list-style-type: none"> • Great bittern (Non-breeding) • Hen harrier (Non-breeding) • Gadwall (Breeding) • Gadwall (Non-breeding) • Northern shoveler (Non-breeding) • Waterbird assemblage • Breeding bird assemblage 	<p>The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any ZOI, none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.</p>	<p>No LSE</p>	<p>N/A</p>	<p>LSE conclusion remains unchanged post Sweetman</p>		
	<p>Stodmarsh Ramsar</p> <p>Ramsar Criterion 2:</p> <ul style="list-style-type: none"> • Six British Red Data Book wetland invertebrates; • two nationally rare plants, • five nationally scarce species; • a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler – non-breeding and hen harrier – non-breeding) 	<p>No LSE</p>					<p>N/A</p>	<p>LSE conclusion remains unchanged post Sweetman</p>
	<p>Stodmarsh SAC</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Desmoulin`s whorl snail 							

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Visual disturbance (onshore)	Visual disturbance during operational maintenance.	Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding); Little tern (Breeding); European golden plover (Non-breeding) 	<p>Ruddy turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>Little tern – not recorded in the surveys of the array and 4 km buffer and the array is beyond this species’ mean maximum foraging range of 6.3 km measured from its [former] breeding location at Sandwich Bay (this species no longer breeds within the SPA but it is still a notified feature of that SPA and may return to breed in the future). Therefore no potential for LSE.</p> <p>Golden plover - given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p>	<p>Potential for LSE for ruddy turnstone and European golden plover</p> <p>No LSE for little tern</p>	N/A	LSE conclusion remains unchanged post Sweetman
		Thanet Coast & Sandwich Bay Ramsar Ramsar Criterion 6 - Species/ populations occurring at levels of international importance: <ul style="list-style-type: none"> Ruddy turnstone (Non-breeding) Red Data Book wetland invertebrates	<p>Turnstone: given the presence of this species within the intertidal/ onshore area of interest and the proximity of functionally linked habitats within the SPA, further assessment will be undertaken in order to determine significance of effects.</p> <p>No potential for significant effect identified for wetland invertebrates.</p>	<p>Potential for LSE for ruddy turnstone</p>	N/A	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		<p>Stodmarsh SPA</p> <ul style="list-style-type: none"> • Great bittern (Non-breeding) • Hen harrier (Non-breeding) • Gadwall (Breeding) • Gadwall (Non-breeding) • Northern shoveler (Non-breeding) • Waterbird assemblage • Breeding bird assemblage 	<p>The SPA/ Ramsar lie approximately 9 km from the onshore extent of the Thanet Extension. Given the distance between this site and the proposed development, the lack of connectivity i.e. no functionally connected preferred foraging or breeding habitats within the Order limits or within any ZOI, none of the qualifying features would be susceptible to direct or indirect effects resulting from disturbance.</p>	No LSE	N/A	LSE conclusion remains unchanged post Sweetman
	<p>Stodmarsh Ramsar</p> <p>Ramsar Criterion 2:</p> <ul style="list-style-type: none"> • Six British Red Data Book wetland invertebrates; • two nationally rare plants, • five nationally scarce species; • a diverse assemblage of rare wetland birds (gadwall – breeding; gadwall – non-breeding; Great Bittern – non-breeding; Northern Shoveler – non-breeding and hen harrier – non-breeding) 	N/A			LSE conclusion remains unchanged post Sweetman	
	<p>Stodmarsh SAC</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Desmoulin`s whorl snail 	Designated species not considered sensitive to visual disturbance			No LSE	N/A

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
Introduction of hard substrate	It is likely that the manmade structures placed on the seabed will be colonised by a range of marine species resulting in a localised increase in biodiversity. These structures also have the potential to act as artificial reefs however they may also facilitate the spread of non-native species.	Thanet coast SAC – <ul style="list-style-type: none"> • Reefs • Submerged or partially submerged sea caves 	Potential for overlap between Annex I habitats and project structures (depending on cable burial method). There is the potential for positive effects on the site through increased biodiversity. Given the presence of TOWF and other local OWFs, the potential for non-native species to occur is already present.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Margate and Long Sands SAC – <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. 	Annex I habitats located within range of relevant physical effect and there is potential for effect from non-native species.	Potential LSE	N/A	LSE conclusion remains unchanged post Sweetman
		Sandwich Bay SAC – <ul style="list-style-type: none"> • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) • Dunes with <i>Salix repens</i> spp. <i>Argentea</i> (<i>Salicion arenaria</i>) 	Habitat features located above high water and therefore no potential for link to subtidal marine non native species.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		Vlaamse Banken relevant species: <ul style="list-style-type: none"> • Twaite shad • River lamprey • Sea lamprey 	The SAC is located at least 39 km from Thanet Extension. None of the cited species have occurred in site specific surveys. Given the localised nature the additional hard structures, it is considered that the potential for a significant effect to the SAC is negligible.	No LSE	No	LSE conclusion remains unchanged post Sweetman
Collision risk	The increased vessel traffic during O&M may results in an increased collision risk to marine mammals.	Southern North Sea cSAC <ul style="list-style-type: none"> • Harbour porpoise Transboundary harbour porpoise sites (22 sites)	Given the high vessel density surrounding the project boundary the increase in vessel movements during operation and maintenance is not considered significant. All sites designated for seals are located at least 24 km from Thanet	No LSE	No	LSE conclusion remains unchanged post Sweetman

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman		
		Transboundary harbour seal sites (7 sites)	Extension, with the risk of injury therefore considered low.					
		Transboundary grey seal sites (10 sites)						
Direct disturbance and displacement (offshore)	Potential for disturbance and species will be species dependant, but up to 4-6 km for the most sensitive species.	Outer Thames Estuary SPA • Red-throated diver	Displacement extent of named species could extend to distance between Thanet Extension and SPA.	Potential for LSE in named species	N/A	LSE conclusion remains unchanged post Sweetman		
		Flamborough and Filey Coast pSPA • Guillemot, razorbill						
		St Abb’s Head to Fast Castle SPA • Guillemot, razorbill (not kittiwake or herring gull)						
				Thanet Coast & Sandwich Bay SPA • Little tern (Breeding);	No potential for displacement or disturbance identified.	No LSE	No	LSE conclusion remains unchanged post Sweetman
				Alde-Ore Estuary SPA • Lesser black-backed gull				
				Alde-Ore Estuary Ramsar • Lesser black-backed gull				
				Foulness (Mid-Essex Coast Phase 5) SPA • Sandwich tern				
		Flamborough Head and Bempton Cliffs SPA • Kittiwake						
Collision risk	Modelling of collision risk and post-construction studies at operating OWFs.	Foulness (Mid-Essex Coast Phase 5) SPA • Sandwich tern	Scale of collision mortality predicted might result in population decline in named species.	Potential for LSE in named species	N/A	LSE conclusion remains unchanged post Sweetman		
		Alde-Ore Estuary SPA • Lesser black-backed gull		[screening to be refined when the				

Potential Impact	Justification	Site and relevant Feature(s)	Consideration of LSE	Conclusion on LSE within the Screening Report	Does the LSE screening take Mitigation into account? (Y/N)	LSE Post Sweetman
		Alde-Ore Estuary Ramsar <ul style="list-style-type: none"> • Lesser black-backed gull 		quantitative CRM outputs from the MExcel based Band 2012 model become available]		
		Flamborough and Filey Coast pSPA <ul style="list-style-type: none"> • Gannet, kittiwake (not guillemot and razorbill) 				
		Flamborough Head and Bempton Cliffs SPA <ul style="list-style-type: none"> • Kittiwake 				
		Outer Thames Estuary SPA <ul style="list-style-type: none"> • Red-throated diver 	No likely significant effect anticipated.	No LSE	No	LSE conclusion remains unchanged post Sweetman
		St Abb’s Head to Fast Castle SPA <ul style="list-style-type: none"> • Guillemot, razorbill 				
		Thanet Coast & Sandwich Bay SPA <ul style="list-style-type: none"> • Little tern (Breeding) 				
Barrier effect	Post-construction studies at operating OWFs.	[none]	Barrier effect not assessed as significant.	No LSE	No	LSE conclusion remains unchanged post Sweetman
Decommissioning						
The potential for LSE during the decommissioning phase are considered to be similar and potentially less than those outlined in the construction phase.						