



Hornsea Project Four: Environmental Statement (ES)

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Volume A4, Annex 6.5: Compensation EIA Annex Part 1

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Non-Technical Summary

Orsted Hornsea Project Four Limited (hereafter the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. The Applicant is proposing a suite of 'without prejudice' Compensation Measures that could be implemented in the event that the Secretary of State (SoS) concludes that there would be an Adverse Effect on Integrity (AEoI) on the Flamborough and Filey Coast (FFC) Special Protection Area (SPA) as a result of Hornsea Four alone and/ or in combination with other plans or projects. For full details on the background to Hornsea Four and the compensation measures see [Volume A4, Annex 6.1: Compensation Project Description](#) and [Section 4](#) below.

The 'without prejudice' Compensation Measures are being considered to provide compensation for a number of species of seabird and across a number of locations where the measures could be located, termed 'Areas of Search' (AoS), with these summarised below. Note that fish habitat enhancement is referred to as a resilience measure.

Compensation Measure	Option	Location	Location ID	Kittiwake	Gannet	Guillemot	Razorbill
Offshore nesting	New	southern North Sea	A1				
Offshore nesting	Repurposed	southern North Sea	A1				
Onshore nesting	New	Cayton Bay to Newbiggin by the Sea	B1				
		Suffolk Coast	B2				
Bycatch	-	Thames Estuary	C1				
		South coast of England: Broadstairs to Plymouth	C2				
Predator eradication	-	Isles of Scilly	D1				
		Rathlin Island, Moyle, Northern Ireland	D2				
		Torquay, Devon	D3				
		Guernsey and Alderney	D4				
Fish habitat enhancement	Seagrass	Rathlin Island, Moyle, Northern Ireland	E1				
		Isles of Scilly	E2				
		Celtic Sea, Wales	E3				
		Plymouth Sound to Helford River	E4				
		Solent	E5				
		Essex Estuaries	E6				
		Humber Estuary	E7				

The process of identifying the type, location and extent of potential compensation measures has considered a number of alternatives to date. Consideration of these commenced in spring 2020, with the preparation of a long list of options. These were consulted on in June 2020, with the subsequently revised short list presented to stakeholders for consultation in autumn 2020. Further work since then has

refined the compensation and resilience measures included here for assessment. The consideration of alternatives is described in more detail in [Section 3](#). It is expected that further work will continue to refine the compensation measures under consideration.

To ensure all potential impacts that may result from the installation/ construction, implementation/ operation/ maintenance, and decommissioning, a Compensation Impacts Register has been established (see [Section 6.3](#) and [Volume A4, Annex 6.3: Compensation Impacts Register](#) for more detail). This is presented as an Excel spreadsheet and includes the following:

- All potential impacts associated with each Compensation Measure, with a unique identification reference which can be traced through the subsequent steps/documents;
- Sets the scope of the Compensation Measures EIA with appropriate justification;
- States the magnitude, sensitivity and significance for all potential impacts associated with all activities, in all phases of development of each Compensation Measure;
- Identifies Commitments to reduce or eliminate LSE; and,
- Defines the Maximum Design Scenario (MDS) for any given impact.

The Impact Register covers the breadth of Environmental Impact Assessment (EIA) topics (encompassing natural environment and human environment) and across all stages of each of the compensation and resilience measures.

A cornerstone of the Hornsea Four assessment process is the establishment of the Compensation Measures Commitments Register (see [Section 4.1.3](#) and [Volume A4, Annex 6.4: Compensation Commitments Register](#)). As advocated in EIA guidance (e.g. IEMA 2004), it is only necessary to assess potential effects arising from the final design, incorporating all primary and tertiary mitigation (only pre-mitigation effects and residual effects need to be both set out where secondary mitigation is required). In this respect, the Applicant has considered the Commitments in making an initial assessment of the likely significant effects.

The Commitments Register includes Commitments that provide the justification for potential effects to be scoped out of the assessment and are sufficient to ensure that all the impacts in the Impacts Register can be mitigated sufficiently to ensure no potential likely significant effect will result in all cases. As such, the potential effects to all receptors and for all the compensation or resilience measures are therefore **not significant** in terms of the EIA Regulations ([Volume A1, Chapter 5: Environmental Impact Assessment Methodology](#)).

The assessment provided in this document is based on the current understanding of the location, scope and nature of the proposed Compensation Measures. It should be noted, however, that ultimately, the Compensation Measures will not be consented through the Hornsea Four DCO application process and will be subject to (where necessary) standalone EIA and HRA processes as part of their own consenting process (for example a Marine Licence application and/or Planning Application). As part of that consenting process, further assessment work will be undertaken, based on refined design and methodology details.

Table of Contents

Non-Technical Summary	i
1 Introduction	10
1.1 Project Background.....	10
1.2 Purpose of this Document	14
1.3 Structure of this Document	14
2 Policy and Legislation	14
3 Consideration of Alternatives	14
4 Project Description.....	17
4.1 Project Description	17
5 Consultation.....	31
6 EIA Methodology.....	31
6.1 Introduction	31
6.2 Overview of Process.....	32
6.3 Compensation Impacts Register.....	33
6.4 Compensation Measures Commitments	34
6.5 Characterisation of the Existing Environment (Baseline)	34
6.6 Impacts, Effects Mitigation and Significance	34
6.7 Cumulative, Inter-Relationships and Transboundary Effects.....	35
7 EIA – New Offshore Artificial Nesting Structures.....	35
7.1 Introduction	35
7.2 Baseline	35
7.3 Assessment.....	49
8 EIA – Repurposed Offshore Artificial Nesting Structures.....	53
8.1 Introduction	53
8.2 Baseline	53
8.3 Assessment.....	53
9 EIA – New Onshore Artificial Nesting Structures	57
9.1 Introduction	57
9.2 Baseline	57
9.3 Assessment.....	69
9.4 Summary: New Onshore Artificial Nesting Structures EIA.....	69
10 EIA – Bycatch Reduction Technology	69
10.1 Introduction	69
10.2 Assessment and Baseline.....	69

11	EIA – Predator Eradication.....	70
11.1	Introduction	70
11.2	Baseline	70
11.3	Assessment.....	82
11.4	Summary: Predator Eradication EIA.....	82
12	EIA – Resilience Measure – Fish Habitat Enhancement (Seagrass).....	82
12.1	Introduction	82
12.2	Baseline	83
12.3	Assessment.....	154
13	Conclusions	158
14	References	159

List of Tables

Table 1:	Potential ‘Without Prejudice’ Compensation Measures for Hornsea Four.....	12
Table 2:	Long list of compensation options for kittiwake.	15
Table 3:	Long list of compensation for auk.	15
Table 4:	Maximum design parameters for a new offshore nesting platform.....	20
Table 5:	Onshore nesting structure design principles.	23
Table 6:	Summary of baseline environment in relation to the Area of Search (Southern North Sea) for new and repurposed offshore nesting structures.....	36
Table 7:	New Offshore Artificial Nesting Structures – Impacts Scoped Out of Assessment.....	50
Table 8:	Repurposed Offshore Artificial Nesting Structures – Impacts Scoped Out of Assessment.....	54
Table 9:	Summary of baseline environment in relation to the Area of Search (Clayton Bay to Blyth) for new onshore nesting structures.	58
Table 10:	Summary of baseline environment in relation to the Area of Search (Suffolk coast) for new onshore nesting structures.	59
Table 11:	Summary of baseline environment in relation to the D1 (Isles of Scilly), D2 (Rathlin Island, Northern Island), D3 (Torquay Devon) and D4 (Guernsey and Alderney) Areas of Search for predator eradication.	71
Table 12:	Summary of baseline environment in relation to the Area of Search E1 (Rathlin Island) for resilience measure - fish habitat enhancement (seagrass).	84
Table 13:	Summary of baseline environment in relation to the Area of Search E2 (Isles of Scilly) for resilience measure - fish habitat enhancement (seagrass).	93
Table 14:	Summary of baseline environment in relation to the Area of Search E3 (Celtic Sea) for resilience measure - fish habitat enhancement (seagrass).	103
Table 15:	Summary of baseline environment in relation to the Area of Search E4 (Plymouth Sound to Helford River) for resilience measure - fish habitat enhancement (seagrass).	114
Table 16:	Summary of baseline environment in relation to the Area of Search E5 (The Solent) for resilience measure - fish habitat enhancement (seagrass).	124
Table 17:	Summary of baseline environment in relation to the Area of Search E6 (Essex Estuaries) for resilience measure - fish habitat enhancement (seagrass).	134
Table 18:	Summary of baseline environment in relation to the Area of Search E7 (Humber Estuary) for resilience measure - fish habitat enhancement (seagrass).....	144

Table 19: Resilience Measure – Fish Habitat Enhancement (Seagrass) – Impacts Scoped Out of Assessment. 155

List of Figures

Figure 1: Compensation Measures Areas of Search Location Plan. 13

Figure 2: Looming Eye Buoy (Source: The Independent)..... 26

Figure 3: A commercially available net light (Source: Fishtek) 26

Figure 4: Compensation Measures EIA Process..... 33

Figure 5: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Physical Processes. 39

Figure 6: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Benthic. . 40

Figure 7: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Fish..... 41

Figure 8: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Marine Mammals. 42

Figure 9: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Ornithology..... 43

Figure 10: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Commercial Fisheries..... 44

Figure 11: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Shipping and Navigation..... 45

Figure 12: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Aviation. 46

Figure 13: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea SLVIA. ... 47

Figure 14: Compensation Measures Area of Search Offshore Nesting A1: Southern North Sea Infrastructure and Other Users. 48

Figure 15: Baseline statutory designation for AoS B1 North (Clayton Bay to Newbiggin by the Sea). ... 60

Figure 16: Baseline statutory designation for AoS B1 South (Clayton Bay to Newbiggin by the Sea). ... 61

Figure 17: Baseline non-statutory designation for AoS B1 North (Clayton Bay to Newbiggin by the Sea). 62

Figure 18: Baseline non-statutory designation for AoS B1 South (Clayton Bay to Newbiggin by the Sea). 63

Figure 19: Baseline historic environment designation for AoS B1 North (Clayton Bay to Newbiggin by the Sea)..... 64

Figure 20: Baseline historic environment designation for AoS B1 South (Clayton Bay to Newbiggin by the Sea)..... 65

Figure 21: Baseline statutory designation for AoS B2 (Suffolk Coast)..... 66

Figure 22: Baseline non-statutory designation for AoS B2 (Suffolk Coast)..... 67

Figure 23: Baseline historic environment designation for AoS B2 (Suffolk Coast). 68

Figure 24: Baseline statutory designation for AoS D1 (Isles of Scilly). 74

Figure 25: Baseline non-statutory designations for AoS D1 (Isles of Scilly). 75

Figure 26: Baseline historic environment designations for AoS D1 (Isles of Scilly)..... 76

Figure 27: Baseline statutory and non-statutory designations for AoS D2 (Rathlin Island, Northern Island)..... 77

Figure 28: Baseline statutory designation for AoS D3 (Torquay Devon)..... 78

Figure 29: Baseline non-statutory designations for AoS D3 (Torquay Devon)..... 79

Figure 30: Baseline historic environment designations for AoS D3 (Torquay Devon). 80

Figure 31: Baseline designation for AoS D4 (Guernsey and Alderney)..... 81

Figure 32: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Physical Processes	86
Figure 33: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Benthic.	87
Figure 34: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Fish and Shellfish.	88
Figure 35: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Marine Mammals.	89
Figure 36: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Ornithology.....	90
Figure 37: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Commercial Fisheries.....	91
Figure 38: Resilience Measures Areas of Search Seagrass E1: Rathlin Island, Northern Ireland Shipping	92
Figure 39: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Physical Processes.	95
Figure 40: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Benthic.	96
Figure 41: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Fish Ecology.	97
Figure 42: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Marine Mammal 1.	98
Figure 43: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Marine Mammal 2.	99
Figure 44: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Ornithology.	100
Figure 45: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Commercial Fisheries.	101
Figure 46: Resilience Measures Areas of Search Seagrass E2: Isles of Scilly Shipping.	102
Figure 47: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Marine Processes.....	105
Figure 48: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Benthic.	106
Figure 49: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Fish.	107
Figure 50: Compensation Measures Areas of Search Seagrass E3: Celtic Sea, Wales Marine Mammals 1.	108
Figure 51: Compensation Measures Areas of Search Seagrass E3: Celtic Sea, Wales Marine Mammals 2.	109
Figure 52: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Ornithology.	110
Figure 53: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Commercial Fisheries.	111
Figure 54: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Shipping and Navigation.	112
Figure 55: Resilience Measures Areas of Search Seagrass E3: Celtic Sea, Wales Designations.....	113
Figure 56: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Marine Processes.	116
Figure 57: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Benthic.....	117
Figure 58: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Fish.....	118
Figure 59: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Marine Mammals.	119
Figure 60: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Ornithology. ...	120
Figure 61: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Commercial Fisheries.	121
Figure 62: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Shipping and Navigation.	122
Figure 63: Resilience Measures Areas of Search Seagrass E4: Helford River, Cornwall Designations... ..	123
Figure 64: Resilience Measures Areas of Search Seagrass E5: The Solent Marine Processes.	126
Figure 65: Resilience Measures Areas of Search Seagrass E5: The Solent Benthic.	127
Figure 66: Resilience Measures Areas of Search Seagrass E5: The Solent Fish.....	128
Figure 67: Resilience Measures Areas of Search Seagrass E5: The Solent Marine Mammals.	129

Figure 68: Resilience Measures Areas of Search Seagrass E5: The Solent Ornithology.	130
Figure 69: Resilience Measures Areas of Search Seagrass E5: The Solent Commercial Fisheries.	131
Figure 70: Resilience Measures Areas of Search Seagrass E5: The Solent Shipping and Navigation.	132
Figure 71: Resilience Measures Areas of Search Seagrass E5: The Solent Designations.	133
Figure 72: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Marine Processes.	136
Figure 73: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Benthic.	137
Figure 74: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Fish.	138
Figure 75: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Marine Mammals.	139
Figure 76: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Ornithology.	140
Figure 77: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Commercial Fisheries. ...	141
Figure 78: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Shipping and Navigation.	142
Figure 79: Resilience Measures Areas of Search Seagrass E6: Essex Estuaries Designations.	143
Figure 80: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Marine Processes.	146
Figure 81: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Benthic.	147
Figure 82: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Fish.	148
Figure 83: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Marine Mammals.	149
Figure 84: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Ornithology.	150
Figure 85: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Commercial Fisheries. ...	151
Figure 86: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Shipping and Navigation.	152
Figure 87: Resilience Measures Areas of Search Seagrass E7: Humber Estuary Designations.	153

Glossary

Term	Definition
Area of Search	A term used to identify the locations for each of the proposed primary Compensation Measures.
Commitment	A term used interchangeably with mitigation and enhancement measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in EIA terms. Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or ES). Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.
Compensation Commitment Register	An Excel spreadsheet which identifies all of the commitments identified for consideration when assessing/ implementing the proposed compensation measures. The compensation commitments relate to both onshore and offshore, and includes the construction, operation and decommissioning phases of development for the proposed Compensation Measures. Document reference: Volume A4, Annex 6.4: Compensation Commitments Register .
Compensation Impacts Register	An Excel spreadsheet which identifies all of the potential effects that the project team have identified that could possibly result from the construction, operation and decommissioning of the Compensation Measures, relating to each technical topic under consideration in the EIA process. See Volume A4, Annex 6.3 Compensation Impacts Register for more details.
Compensation Measures	The measures that have been developed by the Applicant pursuant to the HRA Derogation Provisions “without prejudice” to the Applicants position of no Adverse Effect on Site Integrity at the Flamborough and Filey Coast in respect of the qualifying features. The Compensation Measures are: [offshore and onshore nesting; predator eradication; bycatch and fish habitat enhancement measures.] Each a Compensation Measure and together Compensation Measures.
Cumulative effects	The combined effect of Hornsea Four in combination with the effects from a number of different projects, on the same single receptor/resource. Cumulative impacts are those that result from changes caused by other past, present or reasonably foreseeable actions together with Hornsea Project Four.
Design Envelope	A description of the range of possible elements that make up the Hornsea Project Four design options under consideration, as set out in detail in the project description. This envelope is used to define Hornsea Project Four for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the “Rochdale Envelope” approach.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).

Term	Definition
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the value, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Impact Assessment (EIA) Report.
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Landfall	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all construction works, including the offshore and onshore ECC, intertidal working area and landfall compound. Where the offshore cables come ashore east of Fraisthorpe.
Maximum Design Scenario (MDS)	The maximum design parameters of each Hornsea Four compensation measure (both on and offshore) considered to be a worst case for any given assessment.
Mitigation	A term used interchangeably with Commitment(s) by Hornsea Four. Mitigation measures (Commitments) are embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, or PEIR or ES).
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
UKHO	UK Hydrographic Office

Acronyms

Term	Definition
AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
AEoI	Adverse Effect on Integrity
AfL	Agreement for Lease
AIAA	Areas of Intense Air Activity

Term	Definition
AONB	Area of Outstanding Natural Beauty
AoS	Area of Search
AQMA	Air Quality Management Areas
AWDS	Above Water Deterrents
BEIS	Department for Business, Energy & Industrial Strategy
BAP	Biodiversity Action Plan
CBRA	Cable Burial Risk Assessment
CCS	Carbon Capture and Storage
DCB	Dogger Bank Creyke Beck
DCO	Development Consent Order
DP	Dynamic Positioning
ECC	Export Cable Corridor
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
ES	Environmental Statement
FFC	Flamborough and Filey Coast
HEMS	health emergency medical services
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
JNCC	Joint Nature Conservation Committee
JUV	Jack Up Vehicles
LAT	Lowest Astronomical Tide
LSE	Likely Significant Effect
LW	Low Water
MBES	Multi-Beam Echo Sounder
MCZ	Marine Conservation Zone
MDS	Maximum Design Scenario
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MPA	Marine Protected Area
NFFO	National Federation of Fisherman's Organisations
O&G	Oil and Gas
O&M	Operations and Maintenance
OOEG	Offshore Ornithology Export Topic Group
PEIR	Preliminary Environmental Information Report
PEMMP	Project Environmental Marine Management Plan
PINS	The Planning Inspectorate
PLA	Port of London Authority
PSA	Particle Size Analysis
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SoS	Secretary of State
SPA	Special Protection Area
SNCBs	Statutory Nature Conservation Bodies
SoS	Secretary of State

Term	Definition
SPA	Special Protection Area
SSS	Side-Scan Sonar
TCE	The Crown Estate
TPOs	Tree Preservation Orders
UK	United Kingdom
UKHO	UK Hydrographic Office
UXO	Unexploded Ordnance
WSI	Marine Written Scheme of Archaeological Investigation

Units

Unit	Definition
dB	Decibel (sound pressure)
ft	Feet (distance)
Ha	Hectares (distance)
Hz	Hertz (frequency)
km	Kilometre (distance)
Km ²	Kilometre squared (distance)
m	Metre (distance)
m ²	Metre squared (distance)
nm	Nautical Mile (distance)

1 Introduction

1.1 Project Background

- 1.1.1.1 Orsted Hornsea Project Four Limited (hereafter the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and connection to the electricity transmission network. Detailed information on the project design can be found in [Volume A1, Chapter 1: Project Description](#), with detailed information on the site selection process and consideration of alternatives described in [Volume A1, Chapter 3: Site Selection and Consideration of Alternatives](#).
- 1.1.1.2 The Hornsea Four Agreement for Lease (AfL) area was 846 km² at the Scoping phase of project development. In the spirit of keeping with Hornsea Four's approach to Proportionate Environmental Impact Assessment (EIA), the project has given due consideration to the size and location (within the existing AfL area) of the final project that is being taken forward to Development Consent Order (DCO) application. This consideration is captured internally as the "Developable Area Process", which includes Physical, Biological and Human constraints in refining the developable area, balancing consenting and commercial considerations with technical feasibility for construction.
- 1.1.1.3 The combination of Hornsea Four's Proportionality in EIA and Developable Area Process has resulted in a marked reduction in the array area taken forward at the point of DCO application. Hornsea Four adopted a major site reduction from the array area presented at Scoping (846 km²) to the Preliminary Environmental Information Report (PEIR) boundary (600 km²), with a further reduction adopted for the Environmental Statement (ES) and DCO application (468 km²) due to the results of the PEIR, technical considerations and stakeholder feedback. The evolution of the Hornsea Four Order Limits is detailed in [Volume A1, Chapter 3: Site Selection and Consideration of Alternatives](#) and [Volume A4, Annex 3.2: Selection and Refinement of the Offshore Infrastructure](#).
- 1.1.1.4 The Applicant is submitting a DCO application to the Planning Inspectorate (PINS), supported by a range of plans and documents including an ES which sets out the results of the EIA of Hornsea Four and its associated infrastructure. The Applicant is also submitting a Report to Inform Appropriate Assessment (RIAA) ([B2.2: Report to Inform Appropriate Assessment](#)) which sets out the information necessary for the competent authority (the Secretary of State (SoS) for the Department for Business, Energy & Industrial Strategy (BEIS)) to undertake an Appropriate Assessment (AA) to determine if there is any Adverse Effect on Integrity (AEol) on the national site network as a result of the development of Hornsea Four (alone and or in-combination). Should the conclusion of that AA be AEol (or there is uncertainty around this), that would raise the requirement for the Applicant to consider subsequent stages of the Habitats Regulation Assessment (HRA) process (typically referred to as the derogations), which brings a requirement, among other considerations, to secure compensatory measures.
- 1.1.1.5 In accordance with the Habitats Regulations, the RIAA ([B2.2: Report to Inform Appropriate Assessment](#)) considers whether Hornsea Four could result in an AEol on a conservation site of European importance (European site). The Applicant's evidence presented within the RIAA

concluded that Hornsea Four will not have an AEol on any European site.

- 1.1.1.6 During the consideration of the DCO application for Hornsea Three Offshore Wind Farm (Hornsea Three), the SoS clarified the importance of i) identifying the potential for AEol of designated sites during the pre-application period and ii) considering the need for derogation of the Habitats Regulations during examination, where there is potential for AEol. The SoS further expected Applicants and Statutory Nature Conservation Bodies (SNCBs) to engage constructively during the pre-application period and on these matters, including possible compensatory measures, for consideration during examination. The SoS was clear that this does not require that an agreement is reached between the Applicant and the SNCBs on the potential for significant adverse impacts on designated sites, and that evidence relating to derogation can be provided on a "without prejudice" basis, as the final decision on such matters remains with the SoS.
- 1.1.1.7 As such, the Applicant is proposing a suite of Compensation Measures that could be implemented in the event that the SoS concludes that there would be an AEol on the Flamborough and Filey (FFC) Coast Special Protection Area (SPA) as a result of Hornsea Four. These Compensation Measures are set out in a 'without prejudice' Derogation Case which forms part of the DCO Application ([B2.5: Without Prejudice HRA Derogation Case](#)). The Compensation Measures are proposed "without prejudice" to the Applicant's conclusion of no AEol on the FFC SPA in the RIAA.
- 1.1.1.8 The potential Compensation Measures are set out in [Table 1](#) with further details on the measures set out in [B2.5: Without Prejudice HRA Derogation Case](#). The Compensation Measures are proposed to be located in numerous areas of the UK and beyond, including British dependency islands (see [Figure 1](#)).

Table 1: Potential 'Without Prejudice' Compensation Measures for Hornsea Four.

Compensation Measure	Option	Location	Location ID	Kittiwake	Gannet	Guillemot	Razorbill
Offshore nesting	New	southern North Sea	A1				
Offshore nesting	Repurposed	southern North Sea	A1				
Onshore nesting	New	Cayton Bay to Newbiggin by the Sea	B1				
		Suffolk Coast	B2				
Bycatch	-	Thames Estuary	C1				
		South coast of England: Broadstairs to Plymouth	C2				
Predator eradication	-	Isles of Scilly	D1				
		Rathlin Island, Moyle, Northern Ireland	D2				
		Torquay, Devon	D3				
		Guernsey and Aldernery	D4				
Fish habitat enhancement	Seagrass	Rathlin Island, Moyle, Northern Ireland	E1				
		Isles of Scilly	E2				
		Celtic Sea, Wales	E3				
		Plymouth Sound to Helford River	E4				
		Solent	E5				
		Essex Estuaries	E6				
		Humber Estuary	E7				

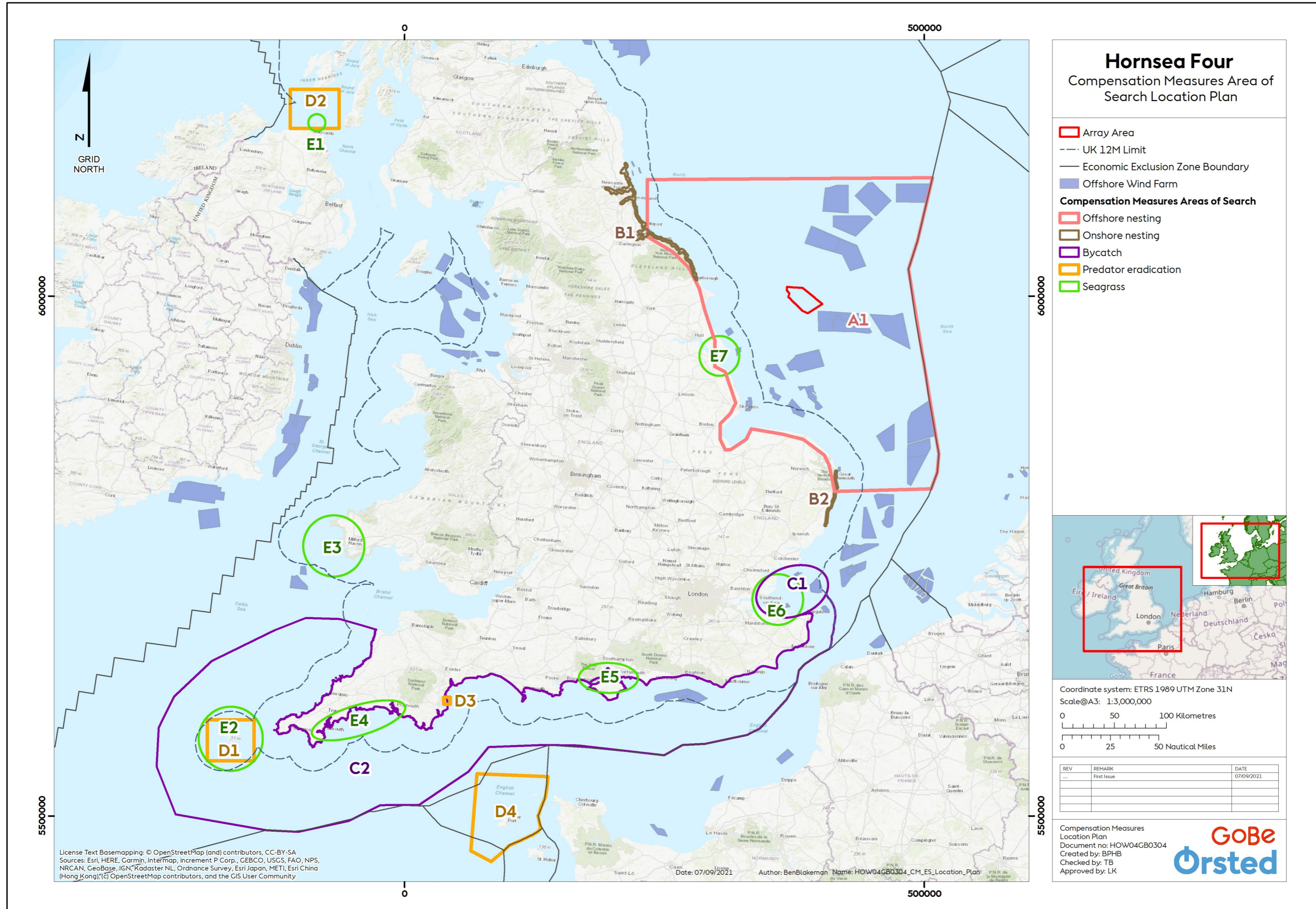


Figure 1: Compensation Measures Areas of Search Location Plan.