



FIVE ESTUARIES OFFSHORE WIND FARM

VOLUME 5, REPORT 4.4: SUMMARY OF DESIGNATED SITES (CLEAN)

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Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	Mar-24	ES	GoBe	GoBe	VE OWFL
B	Mar-25	Deadline 7	GoBe	GoBe	VE OWFL



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DEFINITION OF ACRONYMS

Term	Definition
ECC	Export Cable Corridor
EMS	Environmental Management System
FCS	Favourable Conservation Status
HRA	Habitat Regulations Assessment
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
O&M	Operation and Maintenance
RIAA	Report to Inform Appropriate Assessment
RIS	Ramsar Information Sheet
SAC	Special Area of Conservation
SCI	Site of Community Importance
SNCB	Statutory Nature Conservation Bodies
SPA	Special Protection Area
VE	Five Estuaries



1 INTRODUCTION

- 1.1.1 A summary information on each designated site screened in for potential LSE alone and/ or in combination is provided within this document, including the designated feature(s), key literature sources describing the site and the features/ effects screened in under potential LSE. The conservation objectives for each site are also provided.



2 SOUTHERN NORTH SEA SAC

DISTANCE TO:

- > Array: 0 km
- > Offshore export cable corridor (ECC): 0 km.
- > Onshore ECC: 27.52 km

2.1.1 The Southern North Sea SAC, located to the east of England, stretches from the central North Sea (north of Dogger Bank) to the Straits of Dover in the south, covering an area of 36,951 km²¹. A major portion of the site lies offshore, though it does extend into coastal areas of Norfolk and Suffolk crossing the 12 nautical mile boundary. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammals Technical Baseline;
- > JNCC and Natural England SAC Selection Assessment Document (dated January 2017)²;
- > JNCC and Natural England Conservation Objectives and Advice on Operations for Harbour Porpoise (*Phocoena phocoena*) SAC: Southern North Sea (dated March 2019)³;
- > Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (dated June 2020)⁴;
- > JNCC Natura 2000 Standard Data Form (dated 26th March 2019)⁵; and
- > JNCC: A Conservation Literature Review for the Harbour Porpoise (*Phocoena phocoena*) (dated December 2015)⁶.

2.1.2 The site is designated for the following Annex II species only:

- > Harbour porpoise (*Phocoena phocoena*).

2.1.3 The site assessment in the recent citation assigns a grade of 'A' conservation, which is deemed 'excellent'⁷.

2.1.4 Following the formal designation of the site in February 2019, the Conservation Objectives and Advice on Operations (2019) and 'Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs' (2020) have now been finalised by the SNCBs and therefore this document presents best available advice for impacts assessment of offshore wind activities.

¹ <http://jncc.defra.gov.uk/page-7243>

² <http://jncc.defra.gov.uk/PDF/SouthernNorthSeaSelectionAssessmentDocument.pdf>

³ http://jncc.defra.gov.uk/pdf/SNorthSea_ConsAdvice.pdf

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889842/SACNoiseGuidanceJune2020.pdf

⁵ <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030395.pdf>

⁶

http://jncc.defra.gov.uk/pdf/JNCCReport566_AConservationLiteratureReviewForTheHarbourPorpoise.pdf

⁷ <https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030395.pdf>



2.1.5 Potential LSE has been identified for harbour porpoise with respect to Five Estuaries under the following scenarios (alone and in-combination unless stated):

- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction, operation & maintenance and decommissioning);
- > Collision risk (construction, operation & maintenance and decommissioning);
- > Changes to prey (construction, operation & maintenance and decommissioning); and
- > Accidental pollution and changes in water quality (construction and decommissioning).

2.1.6 The Conservation Objectives for the site⁸ are as follows:

“To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that:

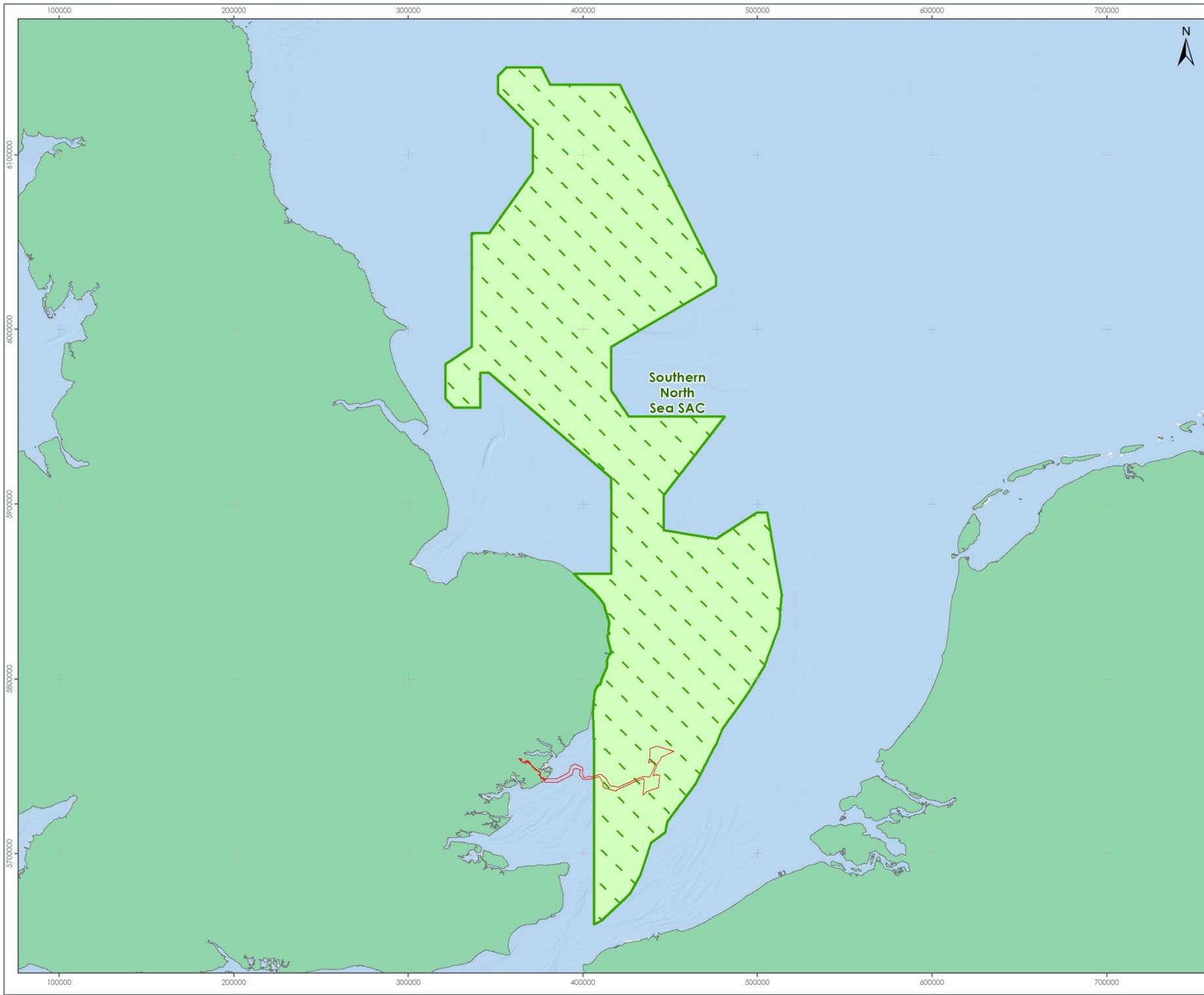
Harbour porpoise is a viable component of the site;

There is no significant disturbance of the species; and



The condition of supporting habitats and processes, and the availability of prey is maintained.

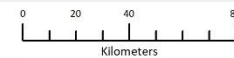
⁸ It is noted that the conservation objectives listed in the June 2020 Guidance on Significant Disturbance

(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889842/SACNoiseGuidanceJune2020.pdf) have slightly different wording to the phrase ‘best possible contribution’ instead stating ‘appropriate contribution’ however the term used in the citation is applied here.



LEGEND

-  Order Limits
-  Special Area of Conservation



Data sources:
Eri, Gornif, GESCO, NOAA NGDC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Southern North Sea SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **2.1**

SCALE: 1:2,000,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N



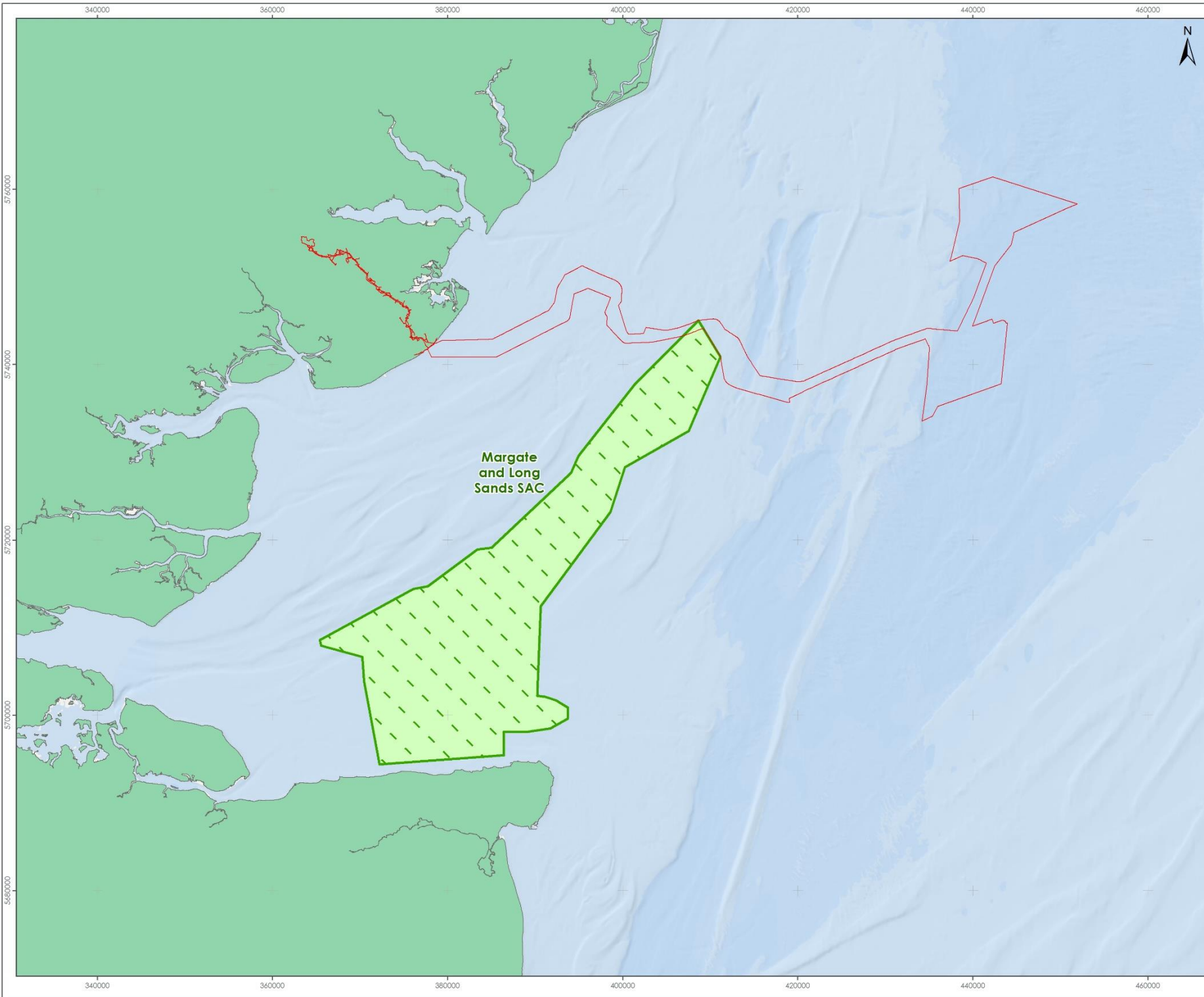
3 MARGATE AND LONG SANDS SAC

DISTANCE TO:

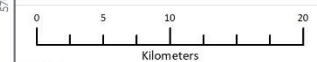
- > Array: 23.61 km
 - > Offshore export cable corridor (ECC): 0km
 - > Onshore ECC: 21.01 km
- 3.1.1 The site starts to the north of the Thanet coast of Kent, proceeding in a north-easterly direction to the outer reaches of the Thames Estuary. The boundary of the site has been drawn to include the flanks of the banks and the intervening troughs, which are important for the structure and function of the sandbanks and support notable faunal communities. Key literature sources, including relevant project literature, are as follows:
- > Volume 2, Chapter 5: Benthic Ecology
- 3.1.2 The site is designated for the following Annex II species only:
- > Sandbanks which are slightly covered by sea water all the time
- 3.1.3 Potential LSE has been identified for sandbanks which are slightly covered by sea water all the time with respect to Five Estuaries under the following scenarios (alone and in-combination unless stated):
- > Physical habitat loss/ disturbance (construction, operation & maintenance and decommissioning);
 - > Suspended sediment/ deposition (construction, operation & maintenance and decommissioning);
 - > Invasive Non-Native Species (INNS) (construction, operation & maintenance and decommissioning);
 - > EMF (operation and maintenance only); and
 - > Changes to physical processes (operation and maintenance only).
- 3.1.4 The Conservation Objectives for the site⁹ are as follows:
- “The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:*
- the extent and distribution of qualifying natural habitats and habitats of the qualifying species;*
- the structure and function (including typical species) of qualifying natural habitats;*
- the structure and function of the habitats of the qualifying species;*
- the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;*

⁹ [Marine site detail \(naturalengland.org.uk\)](https://naturalengland.org.uk)

the populations of each of the qualifying species; and the distribution of qualifying species within the site.”



- LEGEND**
- Order Limits
 - Special Area of Conservation



Data Source:
Eti, Gornitz, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
Margate and Long Sands SAC
in relation to Five Estuaries

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 3.1

SCALE: 1:100000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N

4 OUTER THAMES ESTUARY SPA

DISTANCE TO:

- > Array: 17.24 km
- > Offshore export cable corridor (ECC): 0 km.
- > Onshore ECC: 1.85 km

- 4.1.1 Located off the southeast coast of England, the Outer Thames Estuary SPA is covers three areas of the Southern North Sea, namely the outer estuary of the River Thames as well as the coastal waters off Suffolk and east Norfolk, and an offshore area further to the northeast of Norfolk. The SPA consists of areas of mostly shallower waters between 10 – 30 m (reaching to 50m towards the Eastern boundary of the SPA) with high tidal current streams and a range of sediments dominated by sandy and silt substrates. These features make it a key foraging area for wintering diving species, specifically red-throated divers. The coastal stretches of the SPA consist of shingle and sand beaches, low cliffs, and mudflat-lined estuaries.
- 4.1.2 The SPA is 17.11 km from the VE array area. Site and citation information can be found in the Outer Thames SPA Citation and Conservation Objectives.¹⁰
- 4.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment or not.
- > Red-throated diver (non-breeding), 6,466 individuals (1989-2006/07). Screened in for potential disturbance and displacement during the construction and decommissioning stages alone and in-combination. The VE array area is beyond the maximum expected extent of displacement/disturbance for red-throated divers (see SNCBs, 2022 for recent evidence and SNCB advice on red-throated diver displacement). Therefore, red-throated diver was screened in for disturbance and displacement due to work activity and vessel movements within the preferred ECC only.
 - > Common tern (breeding), 532 individuals (2011-2015). In the screening report, common tern was screened in for risk of collision during Operation and Maintenance (O&M). However, it has subsequently been screened out owing to low numbers recorded within the array (abundance estimate of 3.52 recorded in one month only across the two survey years); and
 - > Little tern (breeding), 746 individuals (2011-2015). Based on initial information, the screening report screened in little tern for:
 - > Risk of disturbance and displacement due to work activity and vessel movements within the preferred offshore ECC only during construction. Little tern in Outer Thames Estuary SPA breed on Scroby Sands intertidal sand bank¹¹, located 79km from the ECC. This is well outside of

¹⁰ European Site Conservation Objectives for Outer Thames Estuary SPA (UK9020309). <http://publications.naturalengland.org.uk/publication/4927106139029504> (Accessed October 2022).

¹¹ Site details for Outer Thames Estuary SPA. <https://designatedsites.naturalengland.org.uk/> (Accessed December 2022).

the reported foraging ranges for the species (Thaxter *et al.*, 2012, 6.3+-2.4km (MMF+-SD); Woodward *et al.*, 2019, 5km (MMF)). In addition, little tern were not detected during the bird surveys of the VE site (March 2019 – February 2021). The species can thus be considered highly unlikely to have connectivity with the VE ECC, and as such, LSE can be discounted in relation to both alone and in-combination effects.

- > Risk of collision on migration during O&M. Evidence shows that little tern are a strictly coastal, rather than marine species; they are the most inshore of all tern species, found in shallow waters on passage (BirdLife International, 2022). WWT & MacArthur Green (2014) found that little tern migrate within 10km of the shoreline. In addition, little tern were not detected during the bird surveys of the VE site (March 2019 – February 2021). Based on the information outlined above, the species can thus be considered highly unlikely to have connectivity with the VE array area, and as such, LSE can be discounted in relation to both alone and in-combination effects.

4.1.4 The Conservation Objectives¹⁰ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

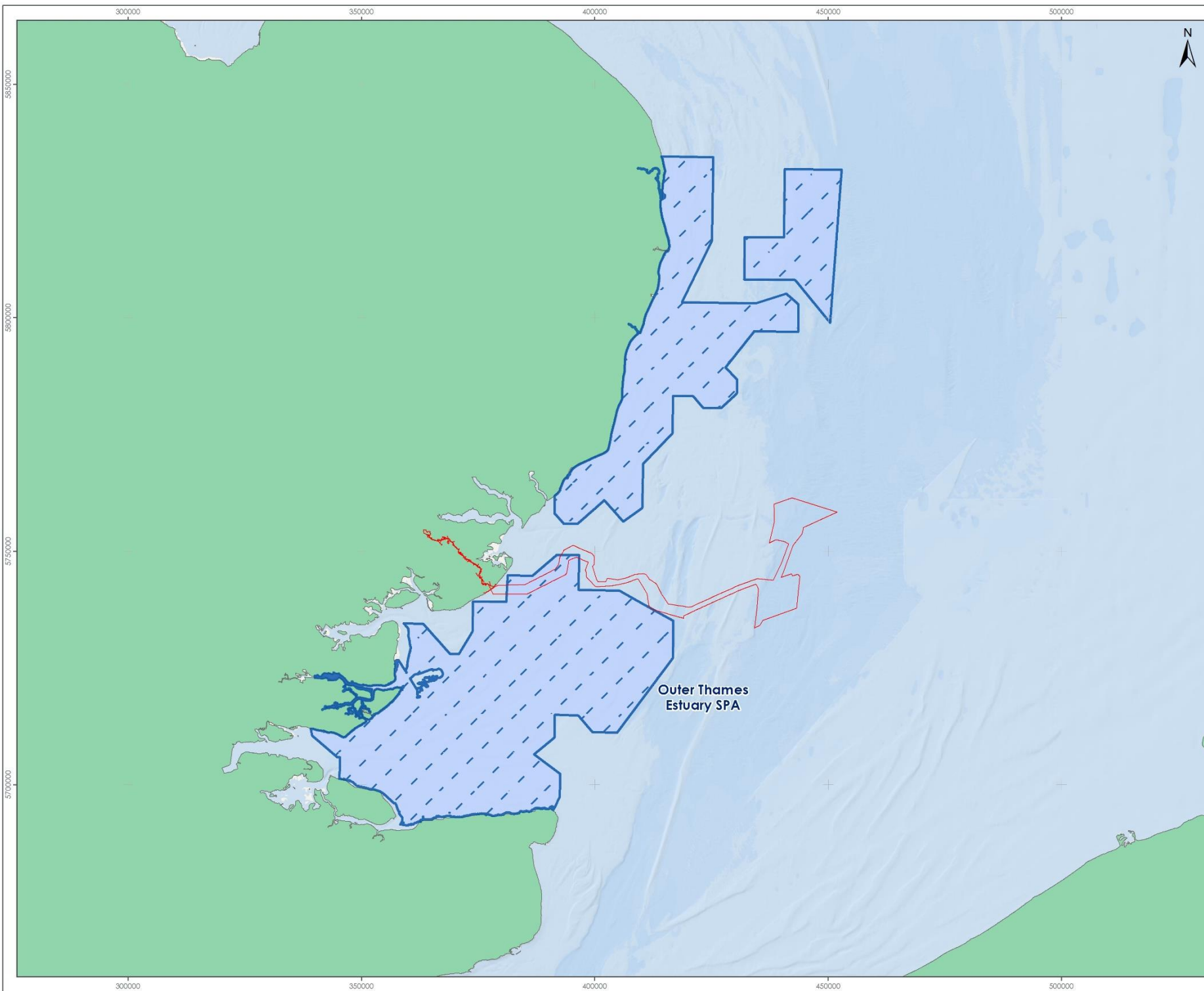
The extent and distribution of the habitats of the qualifying features;

The structure and function of the habitats of the qualifying features;

The supporting processes on which the habitats of the qualifying features rely;

The population of each of the qualifying features; and,

The distribution of the qualifying features within the site”.



LEGEND

-  Order Limits
-  Special Protection Area



Data Source:
SfL, Gemini, OESCO, NDAAHODC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Outer Thames Estuary SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPH	WH

DRAWING NUMBER: 4.1

SCALE	UNIT: KM	PLOT: A3	EXTENT: WGS84	PROJECTION: UTM31N
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5 ESSEX ESTUARIES SAC

DISTANCE TO:

- > Array: 64.38 km
- > Offshore export cable corridor (ECC): 9.02 km
- > Onshore ECC: 7.37 km

5.1.1 The Essex Estuaries EMS is the second largest estuarine site on the east coast of England. It contributes to the essential range and variation of estuaries in the UK as the best example of a coastal plain estuary system on the British North Sea coast. Covering an area of 472 square kilometres, this relatively undeveloped estuary complex contains the major estuaries of the Colne, Blackwater, Crouch and Roach, as well as extensive open coast tidal flats at Foulness, Maplin and the Dengie. The intertidal mudflats and sandflats within the European marine site support a wide range of typical estuarine and marine communities on sediments ranging from the finer estuarine muds and muddy sands to coarser sands and gravels. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 5: Benthic Ecology

5.1.2 The site is designated primarily for the following Annex I habitats¹²:

- > Estuaries
- > Mudflats and sandflats not covered by seawater at low tide
- > Salicornia and other annuals colonizing mud and sand
- > Spartina swards (*Spartinion maritimae*)
- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- > Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)

5.1.3 Annex I habitats present at the site as a qualifying feature, but not a primary reason for selection of this site:

- > Sandbanks which are slightly covered by sea water all the time

5.1.4 Potential LSE has been identified for Sandbanks which are slightly covered by sea water all the time with respect to Five Estuaries under the following scenarios (alone and in-combination unless stated):

- > Physical habitat loss/ disturbance (construction, operation & maintenance and decommissioning);
- > Suspended sediment/ deposition (construction, operation & maintenance and decommissioning);
- > INNS (construction, operation & maintenance and decommissioning);
- > EMF (operation and maintenance only); and
- > Changes to physical processes (operation and maintenance only).

¹² [Alde, Ore and Butley Estuaries - Special Areas of Conservation \(jncc.gov.uk\)](http://jncc.gov.uk)

5.1.5 The Conservation Objectives for the site¹³ are as follows:

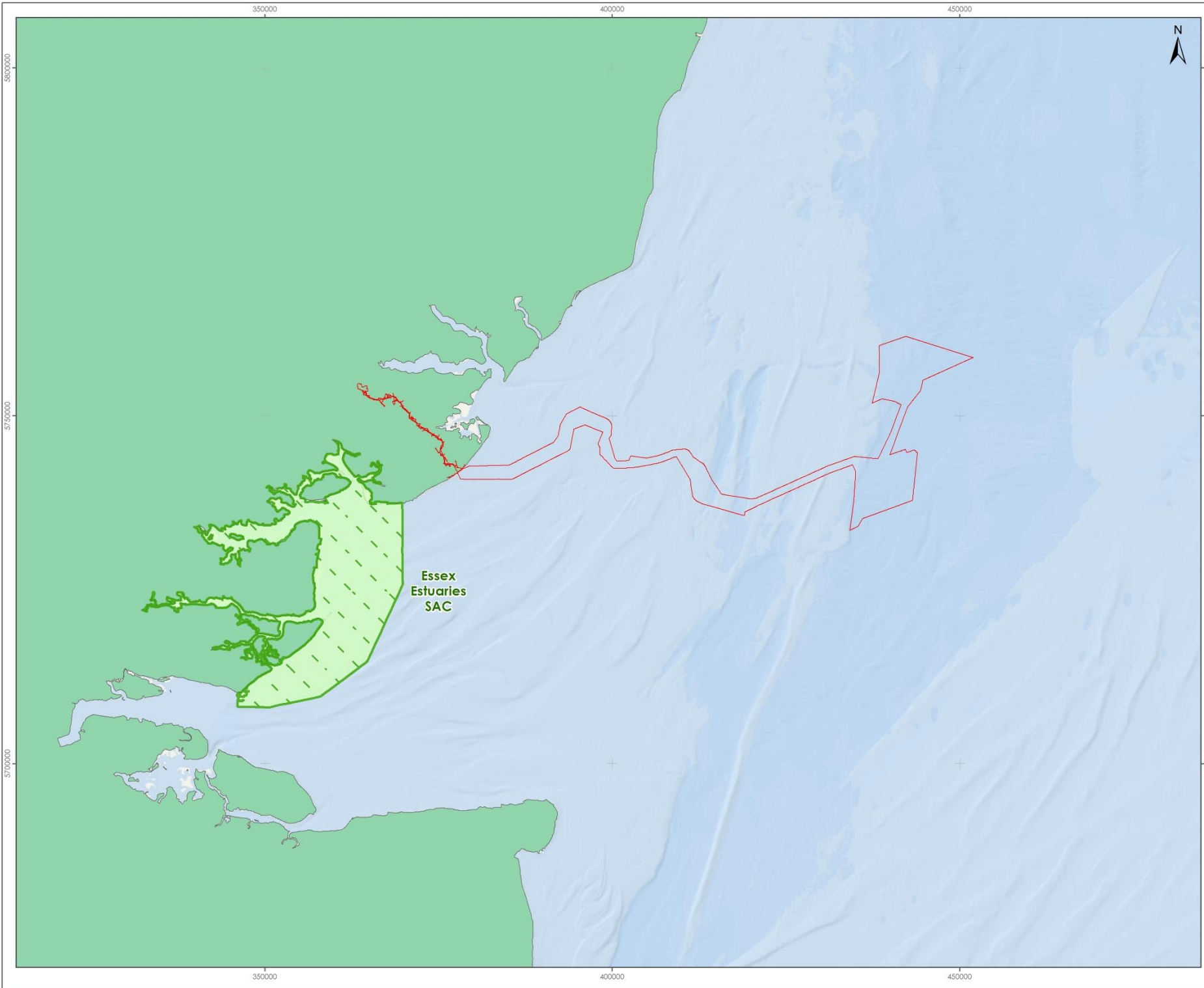
“The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

The extent and distribution of qualifying natural habitats;

The structure and function (including typical species) of qualifying natural habitats; and

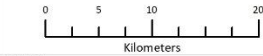
The supporting processes on which qualifying natural habitats rely.”

¹³ [UK0013690 EssexEstuaries SACv2018.pdf](#)



LEGEND

-  Order Limits
-  Special Area of Conservation



Data Source:
Eli, Garmin, GEBCO, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Essex Estuaries SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **5.1**

SCALE: 1:500,000 PLOT SIZE: A3 EXTENT: WG584 PROJECTION: UTM31N



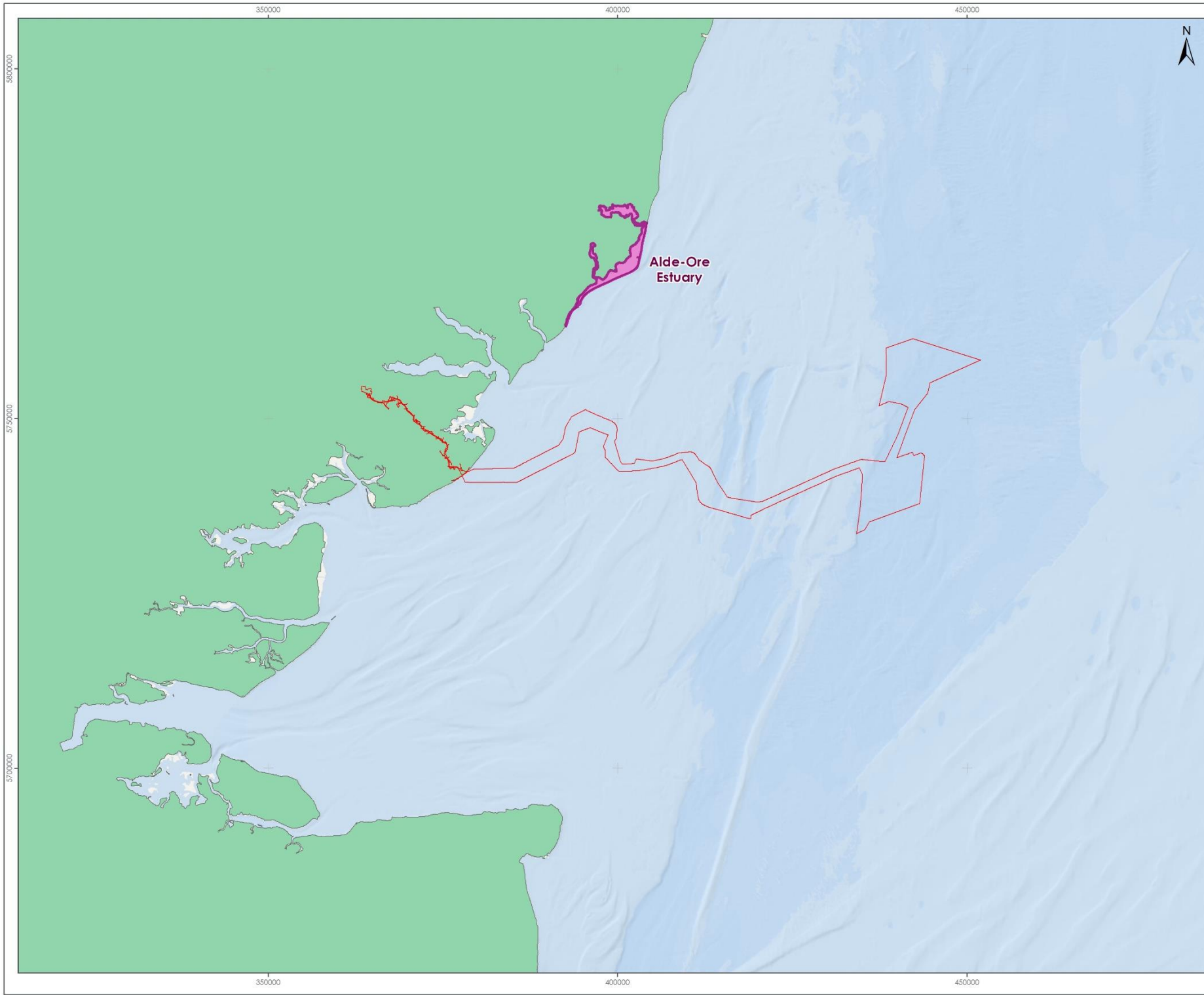
6 ALDE-ORE ESTUARY RAMSAR

DISTANCE TO:

- > Array: 37.44 km
 - > Offshore export cable corridor (ECC): 12.27 km
 - > Onshore ECC: 23.65 km
- 6.1.1 The Alde Ore Estuary Ramsar is located on the east coast of Suffolk, and is made up of the estuaries of the rivers Alde, Butley and Ore, which includes Havergate Island and Orfordness. The site has a variety of habitats, including saline lagoons, saltmarsh, intertidal mudflats, vegetated shingle and semi-improved marshes.
- 6.1.2 The Ramsar is 37.31 km from the VE array area. Key site information can be found in the JNCC Ramsar Information Sheet (RIS) and Ramsar Sites Information Service.¹⁴
- 6.1.3 Listed below are the qualifying species, specifying whether it was screened in for assessment or not.
- > Lesser black-backed gull (breeding), 5,790 Apparently Occupied Nests (AON)(Seabird 2000 census). Screened in for risk of collision during O&M;
 - > Avocet (wintering), 1,187 individuals (1998-99, 2002-03). Screened in risk of collision on migration during O&M; and
 - > Redshank (wintering), 2,368 individuals (1998-99, 2002-03). Screened in for risk of collision on migration during O&M.
- 6.1.4 The Ramsar criteria for which the site is designated, along with qualifying species:
- > Ramsar criterion 2: The site supports a number of nationally scarce plant species and British Red Data Book invertebrates;
 - > Ramsar criterion 3: The site supports a notable assemblage of breeding and wintering wetland birds; and
 - > Ramsar criterion 6: Species/populations occurring at levels of international importance.
- > Lesser black-backed gull (breeding)
 - > Avocet (wintering); and
 - > Redshank (wintering).

¹⁴ JNCC RAMSAR Information Sheet and Ramsar Sites Information Service, accessible from <https://designatedsites.naturalengland.org.uk/>. (Accessed October 2022).

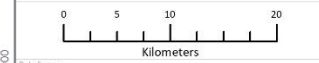
- 6.1.5 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.



LEGEND

Order Limits

Ramsar Site



Data Source:
ESR, Gemini, GEBCO, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Alde-Ore Estuary Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **6.1**

SCALE: 1:100,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



7 FOULNESS (MID-ESSEX COAST PHASE 5) RAMSAR

DISTANCE TO:

- > Array: 67 km
- > Offshore export cable corridor (ECC): 18 km
- > Onshore ECC: 18 km

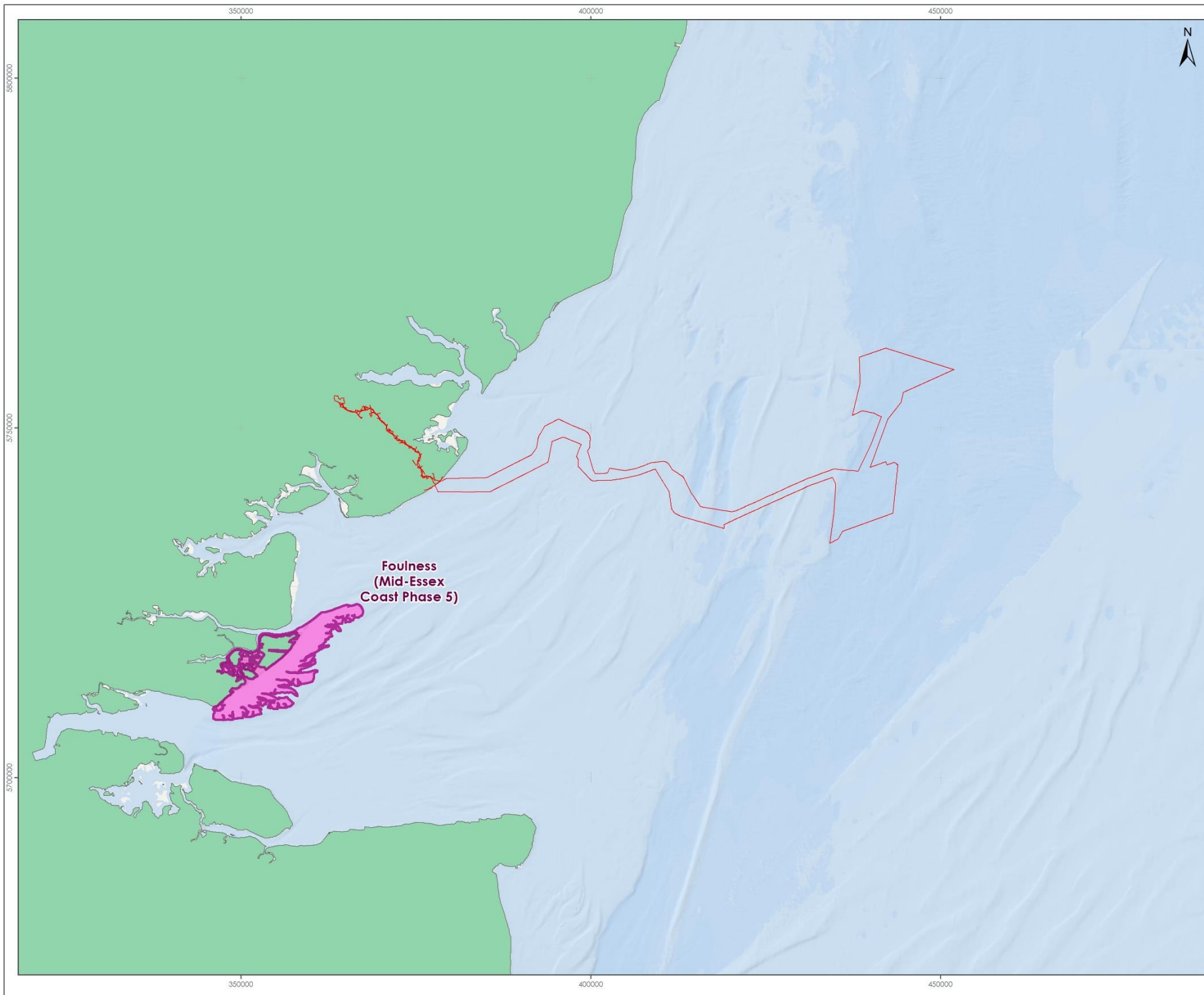
7.1.1 Foulness is an open coast system at the wide northern mouth of the Thames estuary. It is part of an open coast estuarine system comprising grazing marsh, saltmarsh, intertidal mudflats and sandflats which support nationally rare and nationally scarce plants, and nationally and internationally important populations of breeding, migratory and wintering waterfowl. Key literature sources, including relevant project literature, are as follows:

7.1.2 The site is designated for the following Ramsar criteria¹⁵:

- > Ramsar criterion 1: This site qualifies by virtue of the extent and diversity of saltmarsh habitat present. This and four other sites in the Mid-Essex Coast Ramsar site complex, include a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain
- > Ramsar criterion 2: The site supports a number of nationally scarce plant species and British Red Data Book invertebrates
- > Ramsar criterion 3: The site supports a notable assemblage of breeding and wintering wetland birds.
- > Ramsar criterion 4: Assemblages of international importance:
 - > Species with peak counts in winter:
 - > 82148 waterfowl (5 year peak mean 1998/99-2002/2003)
- > Ramsar criterion 6: species/populations occurring at levels of international importance:
 - > Species with peak counts in spring/autumn:
 - > Common redshank , (*Tringa totanus tetanus*), 2586 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3)
 - > Species with peak counts in winter:
 - > Dark-bellied brent goose, (*Branta bernicla bernicla*), 6475 individuals, representing an average of 3% of the population (5 year peak mean 1998/9- 2002/3)
 - > Eurasian oystercatcher, (*Haematopus ostralegus ostralegus*), Europe & NW Africa -wintering 14674 individuals, representing an average of 1.4% of the population (5 year peak mean 1998/9- 2002/3)

- > Grey plover , (*Pluvialis squatarola*), E Atlantic/W Africa -wintering 4343 individuals, representing an average of 1.7% of the population (5 year peak mean 1998/9-2002/3)
- > Red knot , (*Calidris canutus islandica*), W & Southern Africa (wintering) 22439 individuals, representing an average of 4.9% of the population (5 year peak mean 1998/9-2002/3)
- > Bar-tailed godwit , (*Limosa lapponica lapponica*), W Palearctic 4095 individuals, representing an average of 3.4% of the population (5 year peak mean 1998/9-2002/3)

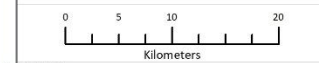
7.1.3 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.



LEGEND

 Order Limits

 Ramsar Site



Data Sources:
Esri, Garmin, GEBCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
Foulness (Mid Essex Coast Phase 5)
Ramsar in relation to Five Estuaries

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 7.1

SCALE: 1:600,000	PLOT SIZE: A3	EXTENT: WGS84	PROJECTION: UTM31N
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8 ABBERTON RESERVOIR SPA

DISTANCE TO:

- > Onshore ECC: 11.4 km

- 8.1.1 The Abberton Reservoir is a large storage reservoir owned by Essex & Suffolk Water lying about four miles south of Colchester. It is the largest freshwater body in Essex and one of the most important reservoirs in Britain for wildfowl. The reservoir is less than five miles from the coast and many birds move between it and nearby intertidal areas and grazing marshes along the Colne and Blackwater estuaries.
- 8.1.2 Site and citation information can be found in the Abberton Reservoir SPA Citation and Conservation Objectives¹⁶.
- 8.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.
- > Cormorant (breeding);
 - > Coot (non-breeding);
 - > Gadwall (non-breeding);
 - > Goldeneye (non-breeding);
 - > Great crested grebe (non-breeding);
 - > Mute swan (non-breeding);
 - > Pochard (non-breeding);
 - > Shoveler (non-breeding);
 - > Teal (non-breeding);
 - > Tufted duck (non-breeding);
 - > Wigeon (non-breeding);
 - > Waterbird assemblage
 - > All of the above are screened in for:
 - > Loss of foraging and roosting habitat outside the SPA (construction);
 - > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
 - > Water quality: pollution from site run-off affecting prey availability (construction and decommissioning);
 - > Decreases in water quantity (construction); and
 - > Decrease in air quality (construction and decommissioning).
- 8.1.4 The Conservation Objectives for the site are:

¹⁶ <https://publications.naturalengland.org.uk/publication/5673002612031488>

“Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the

site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

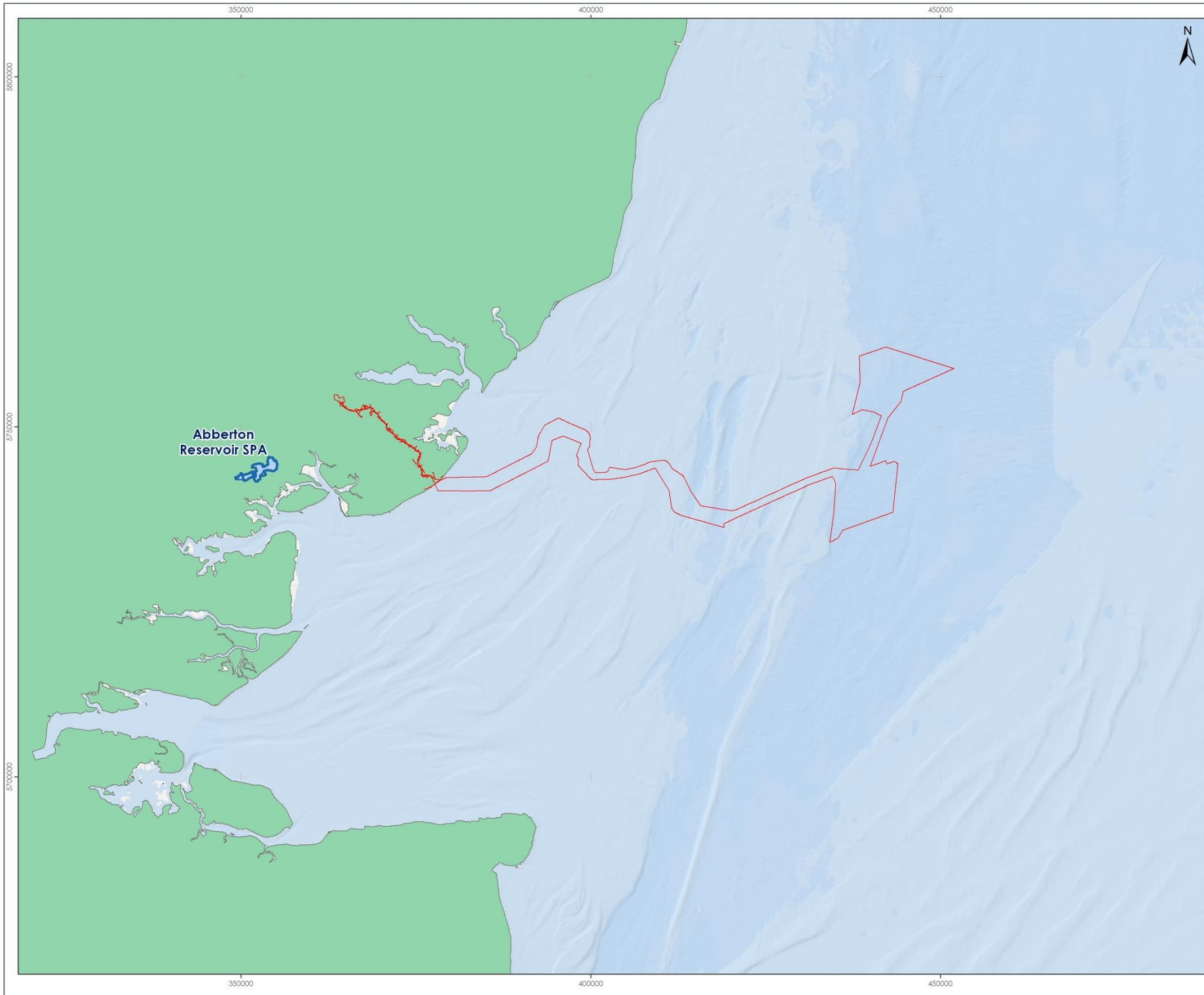
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

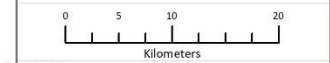
The distribution of the qualifying features within the site.”



LEGEND

 Order Limits

 Special Protection Area



Data Source:
Eti, Gornitz, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Abberton Reservoir SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **8.1**

SCALE	1:100,000	PLOT SIZE	A3	EXTENT	WGS84	PROJECTION	UTM31N
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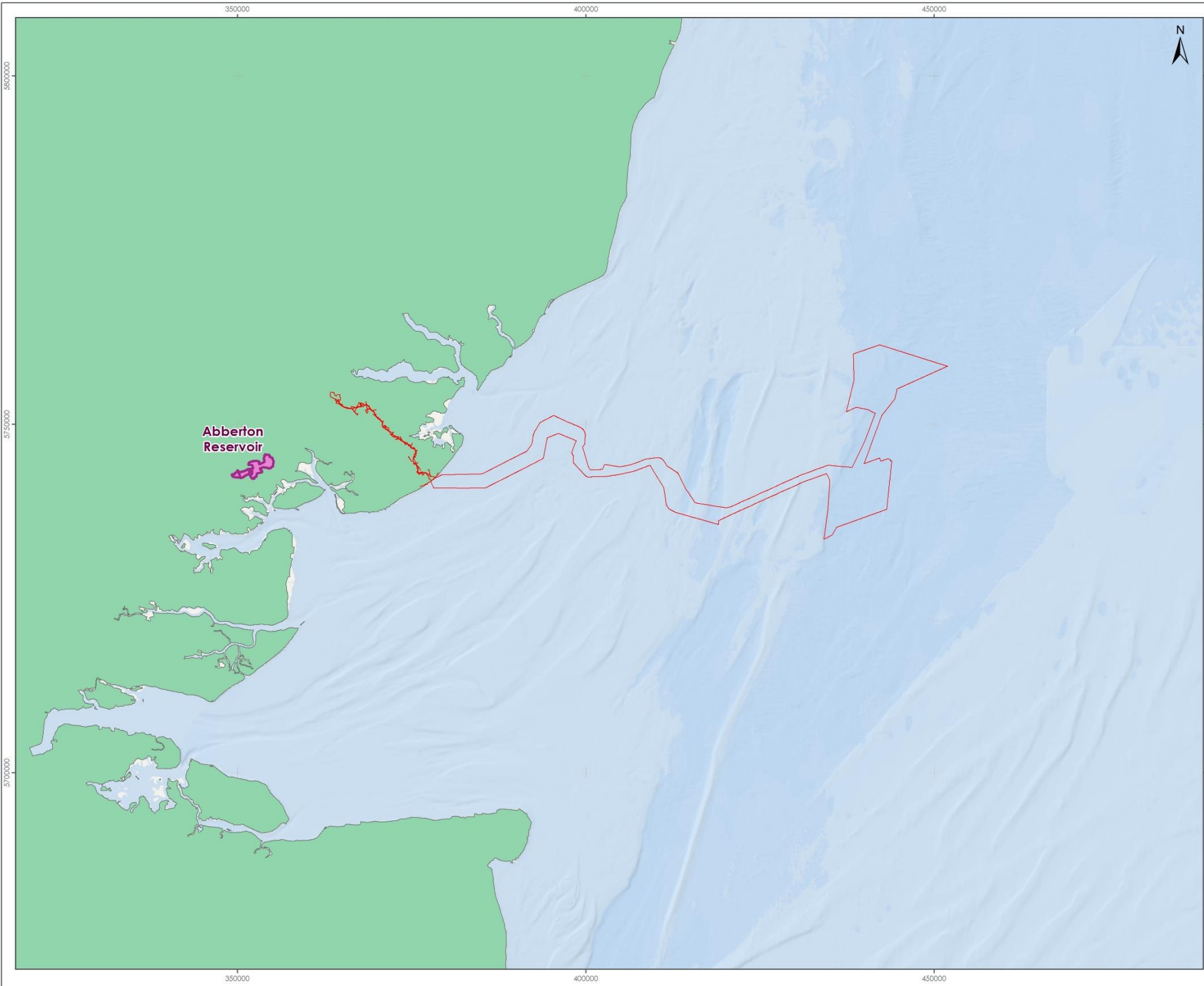
9 ABBERTON RESERVOIR RAMSAR

DISTANCE TO:

- > Onshore ECC: 11.4 km
- 9.1.1 The Abberton Reservoir is a large storage reservoir owned by Essex & Suffolk Water lying about four miles south of Colchester. It is the largest freshwater body in Essex and one of the most important reservoirs in Britain for wildfowl. The reservoir is less than five miles from the coast and many birds move between it and nearby intertidal areas and grazing marshes along the Colne and Blackwater estuaries.
- 9.1.2 The Abberton Reservoir Ramsar is 11.4 km from the VE onshore ECC. Site and citation information can be found in the Abberton Reservoir RIS¹⁷. The receptor group 'onshore ecology' is relevant to the site. Key literature sources, including relevant project literature, are as follows:
 - > Volume 3, Chapter 4: Onshore Biodiversity and Nature Conservation;
 - > Abberton Reservoir Ramsar RIS.
- 9.1.3 The Ramsar criteria for which the site is designated, along with qualifying species:
 - > Ramsar criterion 5: Assemblages of international importance;
 - > Waterbird assemblage
 - > Ramsar criterion 6: Species/populations occurring at levels of international importance.
 - > Wintering;
 - > Gadwall;
 - > Shoveler; and
 - > Wigeon.
- 9.1.4 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.
- 9.1.5 Potential for LSE has been identified for all the above species under the following scenarios:
 - > Loss of foraging and roosting habitat outside the SPA (construction);
 - > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);

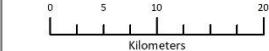
¹⁷ <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://jncc.gov.uk/jncc-assets/RIS/UK11001.pdf>

- > Water quality: pollution from site run-off affecting prey availability (construction and decommissioning);
- > Decreases in water quantity (construction); and
- > Decrease in air quality (construction and decommissioning).



LEGEND

- Order Limits
- Ramsar Site



Data Sources: Eir, Garmin, GBCC, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Abberton Reservoir Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 9.1

SCALE: 1:50000 PLOT SIZE: A3 DATA: WGS84 PROJECTION: UTM31N



10 ALDE-ORE ESTUARY SPA

DISTANCE TO:

- > Array: 37.44 km
- > Offshore export cable corridor (ECC): 12.27 km
- > Onshore ECC: 23.65 km

10.1.1 The Alde Ore Estuary SPA is located on the east coast of Suffolk, and is made up of the estuaries of the rivers Alde, Butley and Ore, which includes Havergate Island and Orfordness. The site has a variety of habitats, including saline lagoons, saltmarsh, intertidal mudflats, vegetated shingle and semi-improved marshes.

10.1.2 The SPA is 37.31 km from the VE array area. Site and citation information can be found in the Alde-Ore Estuary SPA Citation and Conservation Objectives¹⁸, as well as the JNCC SPA data form¹⁹.

10.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Avocet (breeding and non-breeding), 766 wintering individuals (1991-92, 1995-96) and 104 breeding pairs (1990-1994). Screened in for risk of collision on migration during O&M;
- > Lesser black-backed gull (breeding), 11,580 individuals (2000). Screened in for risk of collision during O&M;
- > Redshank (non-breeding), 1,919 individuals (1991-92, 1995-96). Screened in for risk of collision on migration during O&M;
- > Ruff (non-breeding), 3 individuals (1991-92, 1995-96). Screened in for risk of collision on migration during O&M;
- > Sandwich tern (breeding), 170 pairs (1992-1996). Based on initial information, sandwich tern was screened in for:
 - > Direct disturbance and displacement during O&M;
 - > Risk of collision during O&M; and
 - > Barrier effect during O&M.
- > However, the species was subsequently screened out owing to low numbers recorded within the array; only two individuals were recorded throughout the entirety two survey years (both birds recorded in year one, in April and October respectively, no birds recorded in year two). Furthermore, Alde Ore Estuary SPA is beyond mean max foraging range (but within mean max foraging range $\pm 1SD$) of the VE array.

¹⁸ European Site Conservation Objectives for Alde-Ore Estuary SPA (UK9009112). <http://publications.naturalengland.org.uk/publication/5170168510545920> (Accessed October 2022).

¹⁹ Alde-Ore Estuary SPA data form, accessible from <https://jncc.gov.uk/our-work/list-of-spas/> (Accessed October 2022).

- > Marsh harrier (breeding), 3 pairs (1993-1997). Based on initial information, marsh harrier was screened in for risk of collision on migration during O&M in the screening report. However, Alde-Ore Estuary SPA lies directly to the west of the VE array. With migratory marsh harrier migrating to Southern Europe and sub-Saharan Africa (i.e. in a southerly direction) (Wright *et al.* 2012), it can be considered highly unlikely that migrating marsh harrier from this SPA have connectivity with the VE array located to the east, and as such, LSE can be discounted in relation to both alone and in-combination effect; and
- > Little tern (breeding), 48 pairs (1993-94,1996-98). Based on initial information, little tern was screened in for risk of collision on migration during O&M in the screening report. However, evidence shows that little tern are a strictly coastal, rather than marine species; they are the most inshore of all tern species, are found in shallow waters on passage, foraging no further than 15km offshore (BirdLife International, 2022). WWT & MacArthur Green (2014) found that little tern migrate within 10km of the shoreline. The species can therefore be considered highly unlikely to have connectivity with the VE array area on migration, and as such, LSE can be discounted in relation to both alone and in-combination effects.

10.1.4 The Conservation Objectives¹⁸ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

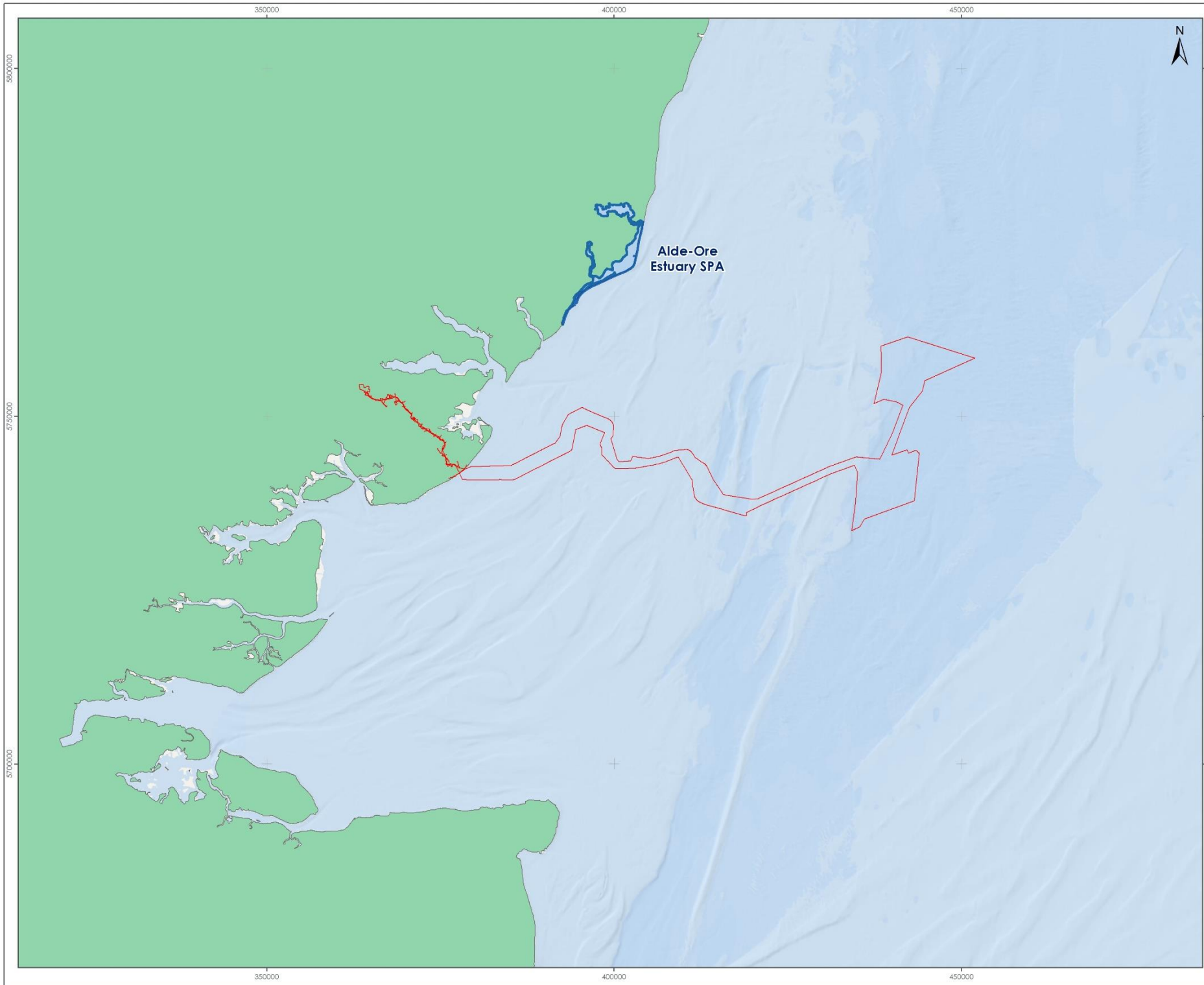
The extent and distribution of the habitats of the qualifying features;

The structure and function of the habitats of the qualifying features;

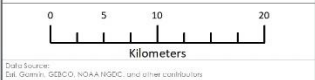
The supporting processes on which the habitats of the qualifying features rely;

The population of each of the qualifying features; and,

The distribution of the qualifying features within the site”.



- LEGEND**
- Order Limits
 - Special Protection Area



PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Alde-Ore Estuary SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BFHB	WH

DRAWING NUMBER: 10.1

SCALE: 1:500,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N



11 BANCS DES FLANDRES SCI

DISTANCE TO:

- > Array: 49 km
- > Offshore export cable corridor (ECC): 53 km.
- > Onshore ECC: 78 km

11.1.1 The Bancs des Flandres SCI (Bank of Flanders) was first proposed in 2010, with the site information sourced dated May 2019²⁰. The site is wholly marine and located in French waters and extends for some 112,919 ha. The receptor group 'marine mammals' is relevant to the Bancs des Flandres SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Bancs des Flandres SCI site information (in French)²¹.

11.1.2 The site is designated for the following Annex I habitat:

- > Sandbanks which are slightly covered by sea water all the time.

11.1.3 The following Annex II species:

- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

11.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only, under the following scenarios:

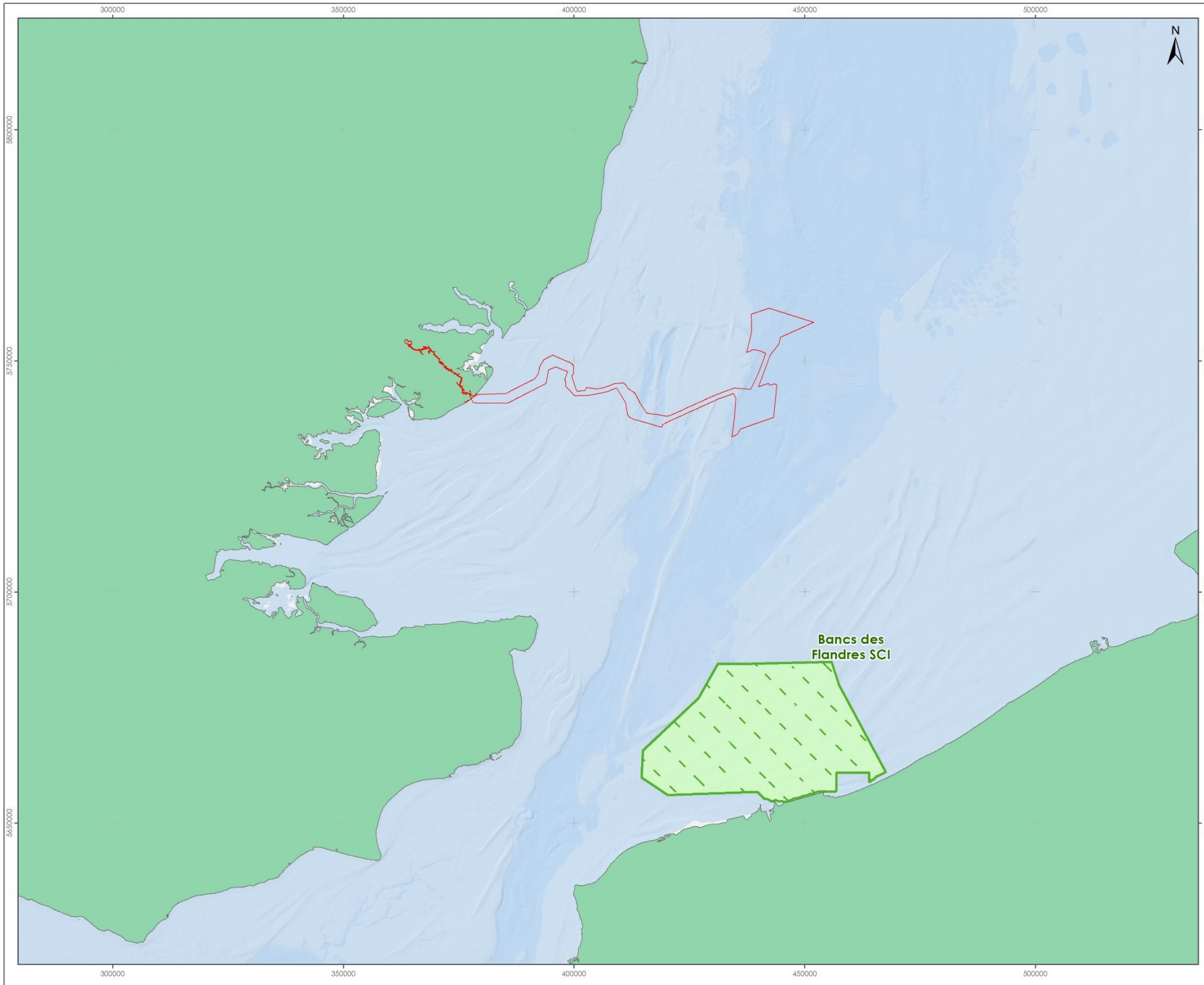
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

11.1.5 No draft Conservation Objectives have been sourced for the Bancs des Flandres SCI, with no management plan available and the information indicating that an objectives document is yet to be produced²². Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

²⁰ <https://inpn.mnhn.fr/site/natura2000/FR3102002>

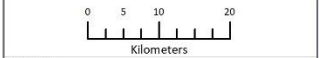
²¹ <https://inpn.mnhn.fr/site/natura2000/FR3102002/tab/gestion>

²² <https://inpn.mnhn.fr/site/natura2000/FR3102002/tab/gestion>



LEGEND

- Order Limits
- Site of Community Importance



Data Source:
Eti, Gornitz, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Bancs des Flandres SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **11.1**

SCALE	UNIT	PLAT	PROJ	PROJ	PROJ
1:10000	UTM	A3	WGS84	UTM31N	



12 BLACKWATER ESTUARY (MID-ESSEX COAST PHASE 4) SPA

DISTANCE TO:

- > Array: 77.81 km
- > Offshore export cable corridor (ECC): 21.08 km.
- > Onshore ECC: 14.36 km

12.1.1 The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and silt flats, including several islands, shingle and shell beaches and extensive areas of saltmarsh. The SPA is 77.7 km from the VE array area. Site and citation information can be found in the Blackwater Estuary (Mid-Essex Coast Phase 4) SPA Citation and Conservation Objectives.²³

12.1.2 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Non-breeding:
 - > Black-tailed godwit
 - > Dark-bellied Brent goose
 - > Dunlin
 - > Grey plover
 - > Hen harrier
 - > Waterbird assemblage
- > Breeding:
 - > Little tern
 - > Pochard
 - > Ringed plover

12.1.3 Each of the above species is screened in for the following:

- > Loss of foraging and roosting habitat outside the SPA (construction);
- > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
- > Pollution from site run-off affecting prey availability (construction and decommissioning);
- > Decreases in water quantity (construction); and
- > Decrease in air quality (construction and decommissioning).

12.1.4 The Conservation Objectives for the site are:

²³ <https://publications.naturalengland.org.uk/publication/4888693533835264>

“Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

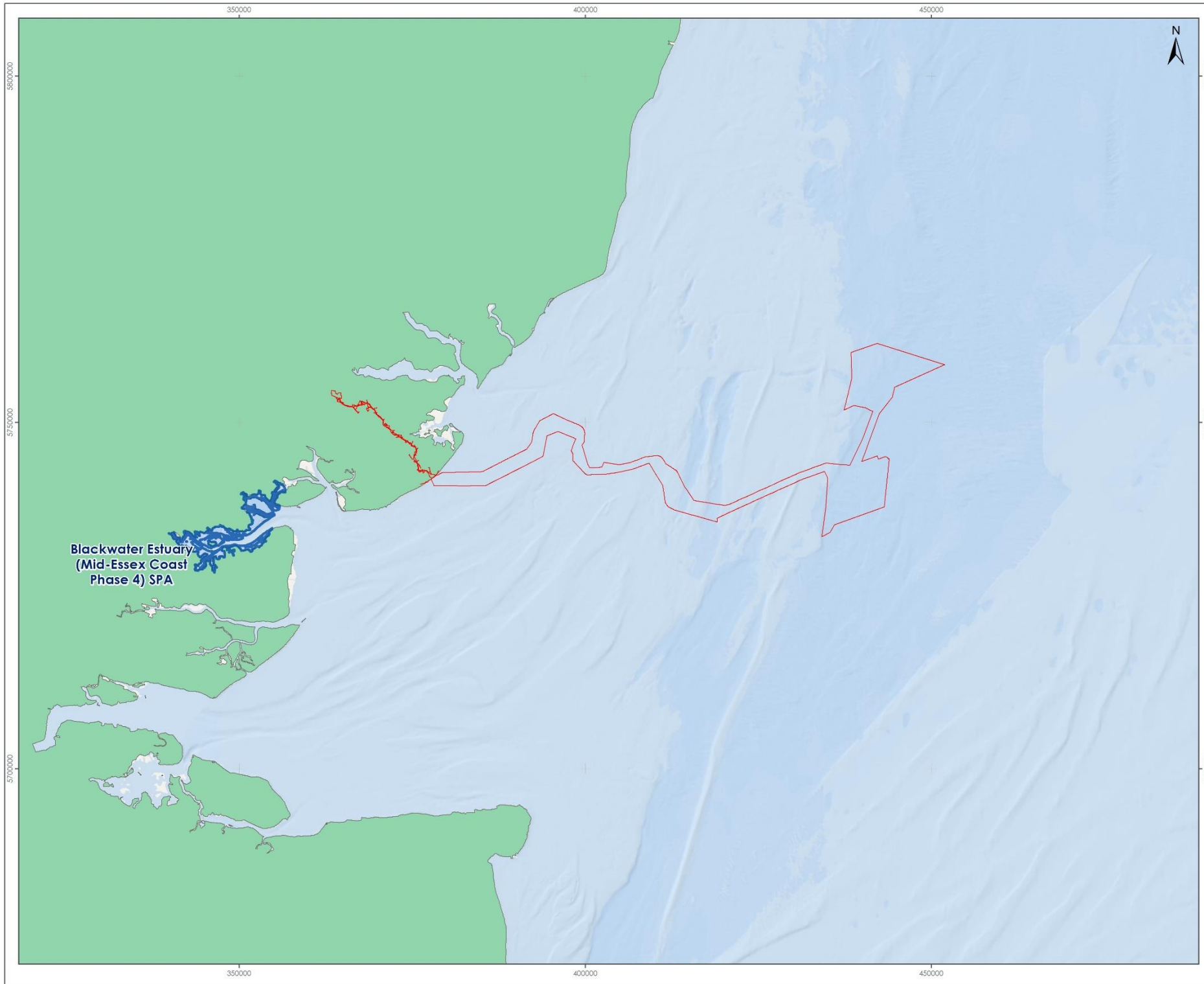
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

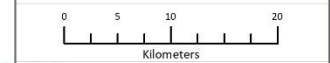
The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

The distribution of the qualifying features within the site.”



- LEGEND**
- Order Limits
 - Special Protection Area



Data Source:
Bnl, Garmin, GBCC, NDA/NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Blackwater Estuary SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPB	WH

DRAWING NUMBER: **12.1**

SCALE: 1:500,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



13 BLACKWATER ESTUARY (MID-ESSEX COAST PHASE 4) RAMSAR

DISTANCE TO:

- > Array: 77.81 km
- > Offshore export cable corridor (ECC): 21.08 km.
- > Onshore ECC: 14.36 km

13.1.1 The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and silt flats, including several islands, shingle and shell beaches and extensive areas of saltmarsh. The Ramsar is 77.7 km from the VE array area. Site and citation information can be found in the Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar RIS²⁴. The receptor group 'onshore ecology' is relevant to the site. Key literature sources, including relevant project literature, are as follows:

- > Volume 3, Chapter 4: Onshore Biodiversity and Nature Conservation;
- > Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar RIS.

13.1.2 The Ramsar criteria for which the site is designated, along with qualifying species:

- > Ramsar criterion 1: Qualifies by virtue of the extent and diversity of saltmarsh habitat present. This site, and the four others in the Mid-Essex Coast complex, includes a total of 3,237 ha that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.
- > Ramsar criterion 2: The invertebrate fauna is well represented and includes at least 16 British Red Data Book species. In descending order of rarity these are: Endangered: a water beetle *Paracymus aeneus*; Vulnerable: a damselfly *Lestes dryas*, the flies *Aedes flavescens*, *Erioptera bivittata*, *Hybomitra expollicata* and the spiders *Heliophanus auratus* and *Trichopterna cito*; Rare: the beetles *Baris scolopacea*, *Philonthus punctus*, *Graptodytes bilineatus* and *Malachius vulneratus*, the flies *Campsicemus magius* and *Myopites eximia*, the moths *Idaea ochrata* and *Malacosoma castrensis* and the spider *Euophrys*.
- > Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.
- > Ramsar criterion 5: Assemblages of international importance;
- > Waterfowl
- > Ramsar criterion 6: Species/populations occurring at levels of international importance.
- > Wintering:
 - > Black-tailed godwit,
 - > Dark-bellied brent goose
 - > Dunlin
 - > Grey plover

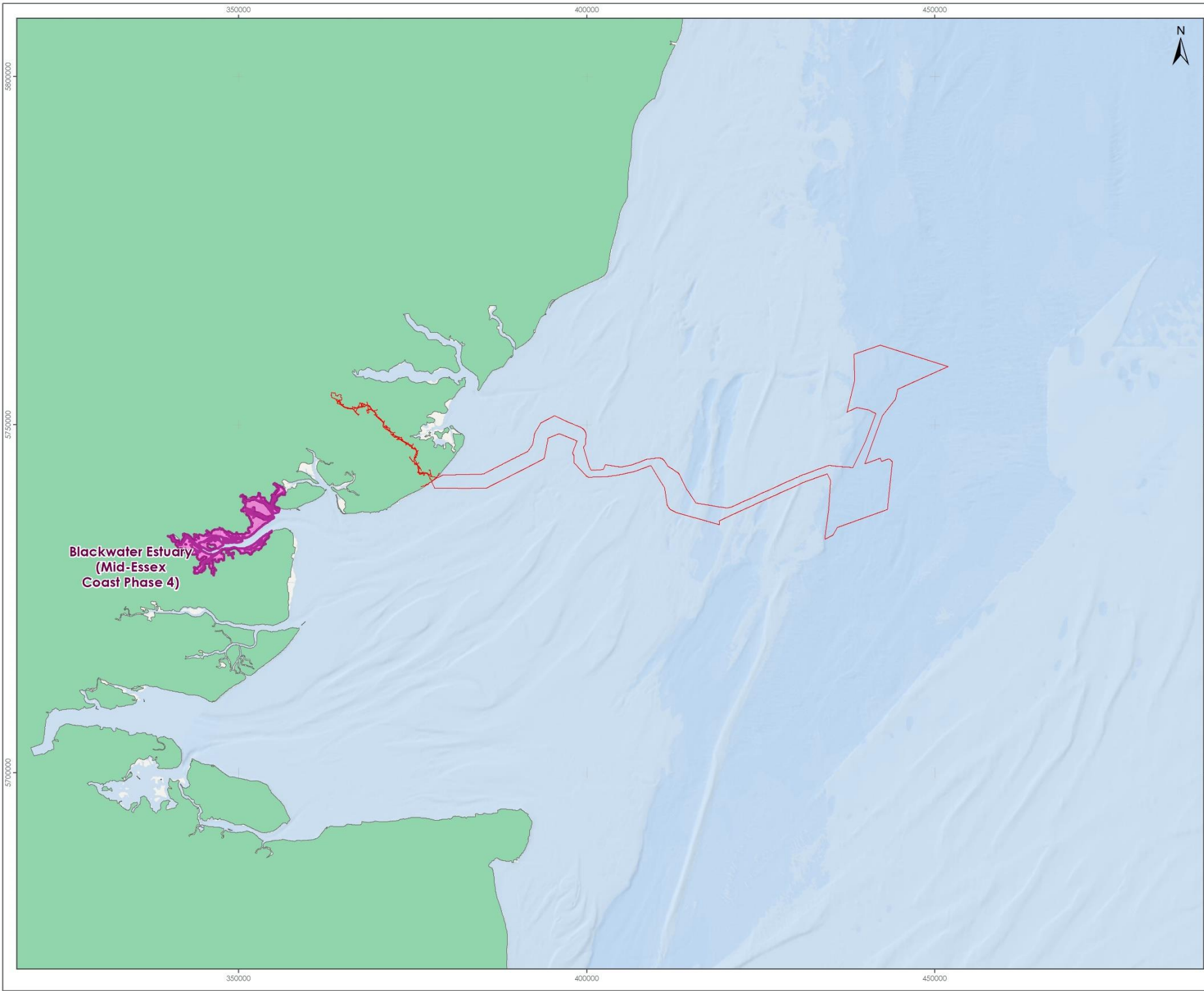
²⁴ <https://jncc.gov.uk/jncc-assets/RIS/UK11007.pdf>

- > Waterbird assemblage
- > Saltmarsh
- > Wetland invertebrate assemblage

13.1.3 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.

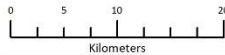
13.1.4 Wetland plant assemblage Potential for LSE has been identified for all the species considered under Ramsar Criterion 6 under the following scenarios:

- > Loss of foraging and roosting habitat outside the SPA (construction);
- > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
- > Pollution from site run-off affecting prey availability (construction and decommissioning);
- > Decreases in water quantity (construction);
- > Decrease in air quality (construction and decommissioning); and
- > Impacts on supporting populations of plants and invertebrates outside the Ramsar (construction and decommissioning).



LEGEND

- Order Limits
- Ramsar Site



Data Source:
 Eir, Garmin, GBICO, NOAA NGDC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Blackwater Estuary Ramsar
 in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 13.1

SCALE: 1:50,000 | GRID: A3 | DATUM: WGS84 | PROJECTION: UTM31N



14 BERWICKSHIRE AND NORTH NORTHUMBERLAND COAST SAC

DISTANCE TO:

- > Array: 445.9 km
 - > Offshore export cable corridor (ECC): 434.21 km.
 - > Onshore ECC: 418.96 km
- 14.1.1 The Berwickshire and North Northumberland Coast SAC covers a varied stretch of coastline, encompassing around 65,226 km². The receptor group 'marine mammals' is relevant to the Berwickshire and North Northumberland Coast SAC. Key literature sources, including relevant project literature, are as follows:
- > Volume 2, Chapter 7: Marine Mammals;
 - > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline;
 - > The Natural England and SNH Regulation 33 Advice for the Berwickshire and North Northumberland Coast European Marine Site (2000)²⁵;
 - > Berwickshire and North Northumberland Coast Conservation Objectives (dated November 2018)²⁶;
 - > Berwickshire and North Northumberland Coast SAC citation (dated July 2014²⁷); and
 - > SNH advice on Feature condition²⁸.
- 14.1.2 The site is designated for the following Annex I habitats:
- > Large shallow inlets and bays;
 - > Mudflats and sandflats not covered by seawater at low tide;
 - > Reefs; and
 - > Submerged and partially submerged sea caves.
- 14.1.3 Together with the following Annex II species:
- > Grey seal (*Halichoerus grypus*).
- 14.1.4 Of these, potential for LSE has been identified for grey seal (*Halichoerus grypus*) only (with no condition of the feature sourced), under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and

²⁵ <http://publications.naturalengland.org.uk/file/3495936>

²⁶ <http://publications.naturalengland.org.uk/file/5347333881724928>

²⁷ <http://publications.naturalengland.org.uk/file/4527238296895488>

²⁸ <https://sitelink.nature.scot/site/8207>

- > Disturbance at haul out (construction, operations and maintenance and decommissioning).
- 14.1.5 The citation describes the site as being representative of grey seal breeding colonies in the south-east of its breeding range in the UK, supporting around 2.5% of annual UK pup production (noting that other sources give different numbers, e.g. the Regulation 33 document²⁹ cites 3%). The Regulation 33 document notes that the UK holds some 33% of the world population of grey seals and 95% of the European population. The Berwickshire and North Northumberland SAC population is one of the largest breeding colonies on the North Sea coast, with the area around the Farne Islands being the preferred food source for grey seals in this area. SNH lists the feature condition as 'favourable'.
- 14.1.6 The Advice on Activities is provided in the Regulation 33 Advice (dating from 2000), which for grey seal is a need to manage activities resulting in deterioration or disturbance to habitats or species resulting from the following:
- > Visual disturbance and/or disturbance by noise; and
 - > Synthetic toxic contamination.
- 14.1.7 The relevant site improvement plan is dated April 2015³⁰, with measures linked to grey seal including public access to the site (disturbance) and direct threat from a third party. The measures identified were managing visitor access to the site and the provision of visitor information.
- 14.1.8 The Conservation Objectives for the site³¹ are as follows:
- “With regard to the SAC and the natural habitats and/or species for which the site has been designated, and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*
- the extent and distribution of qualifying natural habitats and habitats of the qualifying species;*
- the structure and function (including typical species) of qualifying natural habitats;*
- the structure and function of the habitats of the qualifying species;*
- the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;*
- the populations of qualifying species; and*
- the distribution of qualifying species within the site.”*

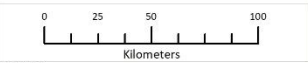
²⁹ <http://publications.naturalengland.org.uk/file/3495936>

³⁰ <http://publications.naturalengland.org.uk/file/4788230077546496>

³¹ <http://publications.naturalengland.org.uk/file/5347333881724928>



- LEGEND**
- Order Limits
 - Special Area of Conservation



Data Source:
BfI, Garmin, GBCC, NDA/NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
Berwickshire and North Northumberland Coast SAC in relation to Five Estuaries

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPB	WH

DRAWING NUMBER: **14.1**

SCALE: 1:2,000,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



15 COLNE ESTUARY (MID-ESSEX COAST PHASE 2) SPA

DISTANCE TO:

- > Array: 66.63 km
- > Offshore export cable corridor (ECC): 10.89 km.
- > Onshore ECC: 7.3 km

15.1.1 The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and silt flats, including several islands, shingle and shell beaches and extensive areas of saltmarsh. The SPA is 66.5 km from the VE array area. Site and citation information can be found in the Colne Estuary (Mid-Essex Coast Phase 2) SPA Citation and Conservation Objectives.³²

15.1.2 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Over winter:
 - > Dark-bellied brent goose
 - > Hen harrier
 - > Pochard
 - > Redshank
 - > Ringed plover
 - > Waterbird assemblage
- > During the breeding season:
 - > Little tern

15.1.3 Each of the above species is screened in for the following:

- > Loss of foraging and roosting habitat outside the SPA (construction);
- > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
- > Pollution from site run-off affecting prey availability (construction and decommissioning);
- > Decreases in water quantity (construction); and
- > Decrease in air quality (construction and decommissioning).

15.1.4 The Conservation Objectives for the site are:

“Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

The extent and distribution of the habitats of the qualifying features

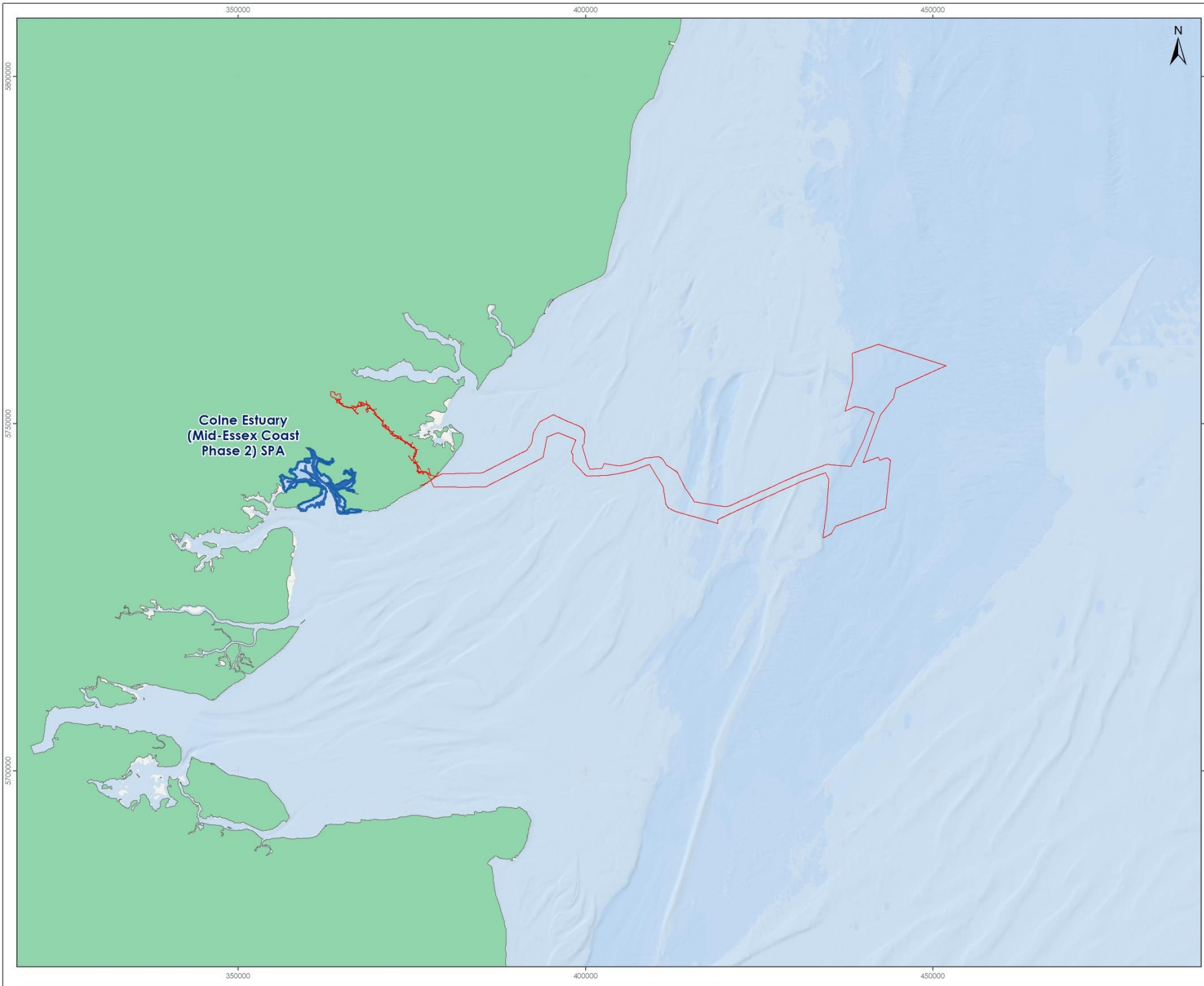
³² <https://publications.naturalengland.org.uk/publication/5664206519009280>

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

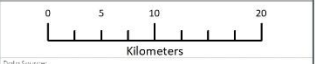
The population of each of the qualifying features, and,

The distribution of the qualifying features within the site.”



LEGEND

- Order Limits
- Special Protection Area



Data Source: Os, Garmin, GEBCO, NOAA, NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Colne Estuary SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **15.1**

SCALE: 1:500,000 | PLOT SIZE: A3 | DATE: 14/03/2024 | PROJECT: FIVE ESTUARIES OFFSHORE WINDFARM

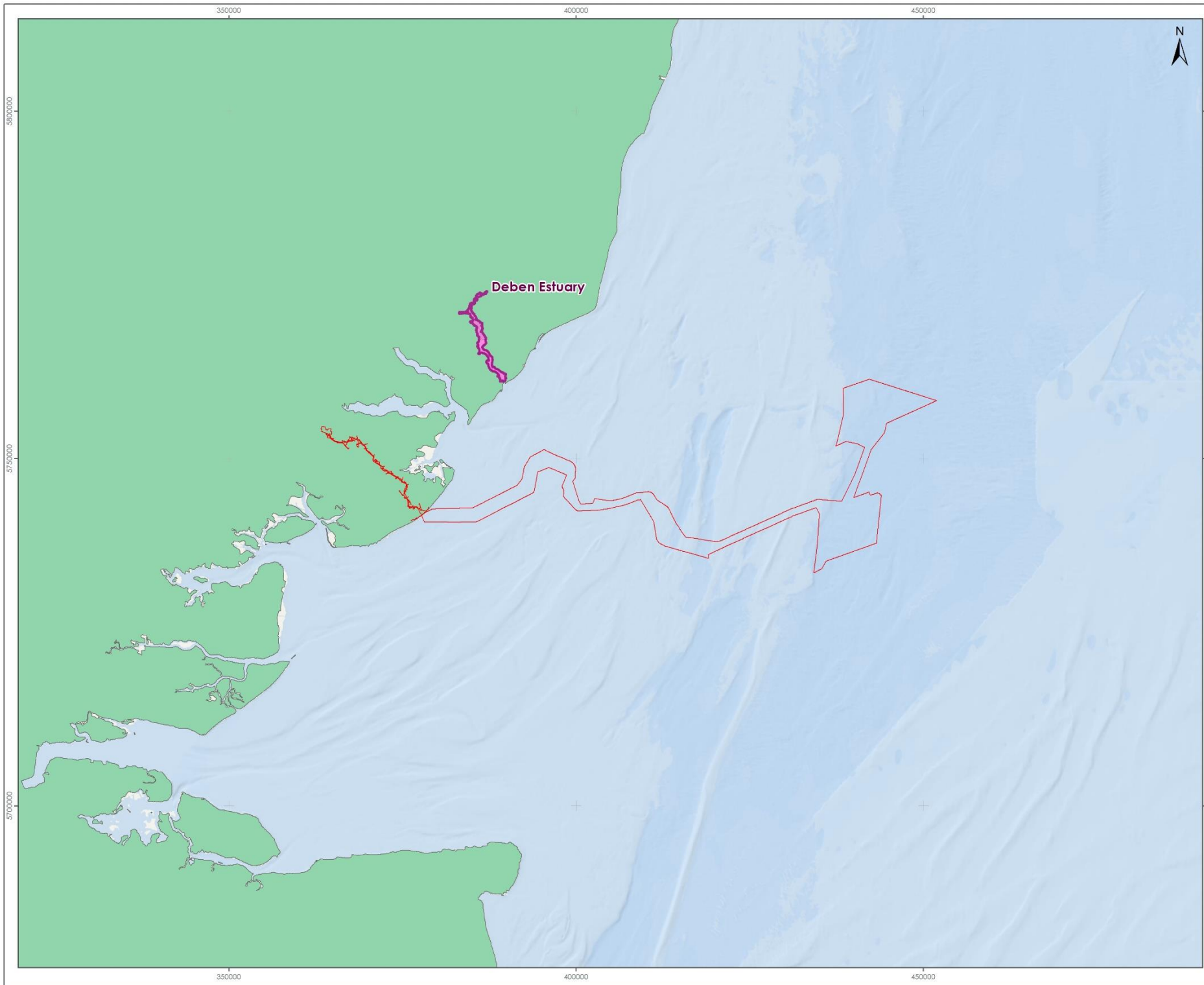


16 DEBEN ESTUARY RAMSAR

DISTANCE TO:

- > Array: 48.45 km
 - > Offshore export cable corridor (ECC): 11.39 km.
 - > Onshore ECC: 19.65 km
- 16.1.1 Deben Estuary Ramsar is located in East Anglia, on the east coast of Suffolk. It is a sheltered estuary with areas of saltmarsh and intertidal mudflats displaying the most complete range of saltmarsh community types in Britain.
- 16.1.2 Key site information can be found in the JNCC RIS and Ramsar Sites Information Service.³³
- 16.1.3 Dark-bellied brent goose (wintering) is the qualifying species at this site (1,953 individuals (1998-99 to 2002-03)). Screened in for risk of collision on migration during O&M.
- 16.1.4 Listed below are the Ramsar criteria for which the site is designated, along with qualifying species. For each bird species, it is specified whether it was screened in for assessment.
- > Ramsar criterion 2: supports a population of the mollusc *Vertigo angustior*; and
 - > Ramsar criterion 6: species/populations occurring at levels of international importance;
 - > Dark-bellied brent goose (wintering).

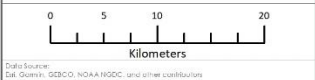
³³ JNCC RAMSAR Information Sheet and Ramsar Sites Information Service, accessible from <https://designatedsites.naturalengland.org.uk/>. (Accessed October 2022)



LEGEND

Order Limits

Ramsar Site



Data Sources:
Eut. Ocean; GEBCO; NOAA NODC; and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Deben Estuary Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BFHB	WH

DRAWING NUMBER: 16.1

SCALE: 1:500,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N



17 DEBEN ESTUARY SPA

DISTANCE TO:

- > Array: 48.45 km
- > Offshore export cable corridor (ECC): 11.39 km.
- > Onshore ECC: 19.65 km

17.1.1 The Deben Estuary SPA is located on the east coast of England, within Suffolk. The SPA is a sheltered and narrow estuary which extends for approximately 18km. Shifting gravel and sandbanks shield the mouth of the estuary. This SPA has tidal areas, as well as areas beyond the influence of the tide.

17.1.2 The SPA is 48.32 km from the VE array area. Site and citation information can be found in the Deben Estuary SPA Citation and Conservation Objectives³⁴.

17.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Avocet (non-breeding), 57 individuals during the wintering period (1988-89 to 1992-93). Screened in for risk of collision on migration during O&M; and
- > Dark-bellied brent goose (non-breeding), 1,889 individuals (1988-89 to 1992-93). Screened in for risk of collision on migration during O&M.

17.1.4 The Conservation Objectives¹¹ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

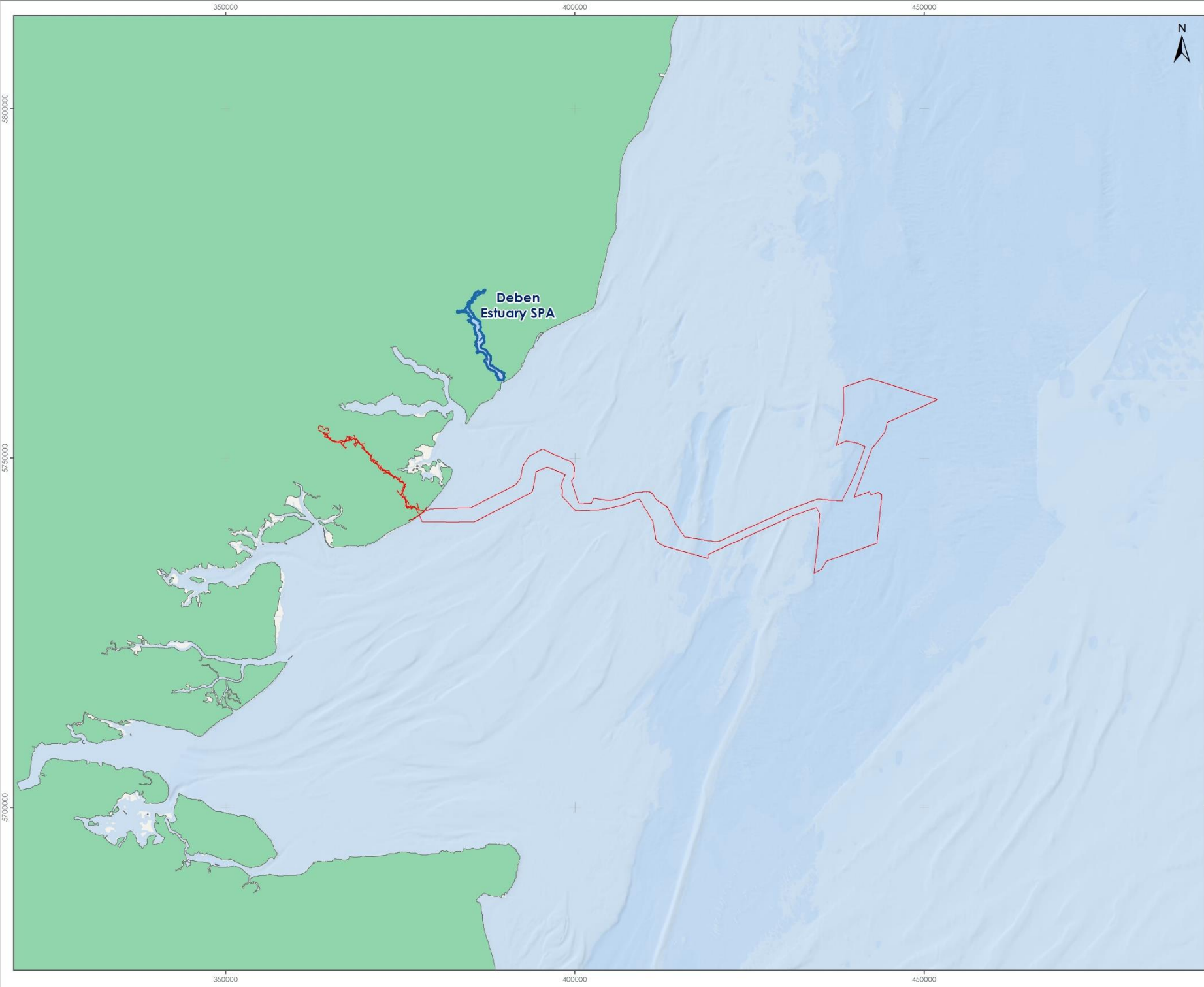
The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

The distribution of the qualifying features within the site”.

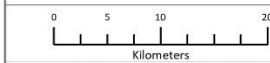
³⁴ European Site Conservation Objectives for Deben Estuary SPA (UK9009261).

<http://publications.naturalengland.org.uk/publication/5749484436848640>. Accessed October 2022



LEGEND

-  Order Limits
-  Special Protection Area



Data Source: Esri, Garmin, GEBCO, NOAA/NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Deben Estuary SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **17.1**

SCALE: 1:500,000 EASTING: A3 DATUM: WGS84 PROJECTION: UTM31N



18 VLAAMSE BANKEN SAC

DISTANCE TO:

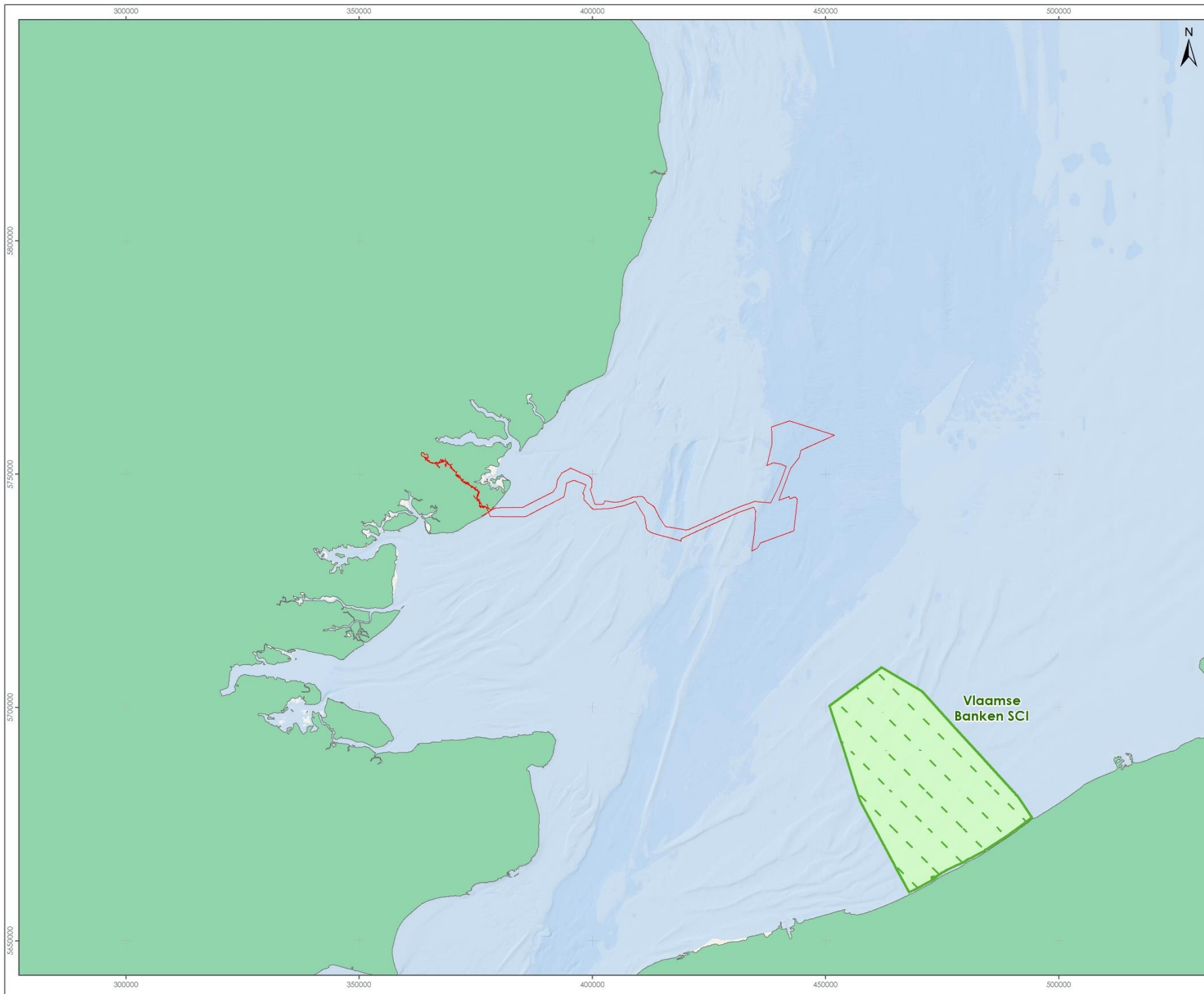
- > Array: 34.75 km
 - > Offshore export cable corridor (ECC): 40.44 km.
 - > Onshore ECC: 83.67 km
- 18.1.1 The Vlaamse Banken SCI is located in Belgian waters and extends for some 109,940 ha³⁵. The receptor groups 'marine mammals' and 'migratory fish' are relevant to the Vlaamse Banken SAC. Key literature sources, including relevant project literature, are as follows:
- > Volume 2, Chapter 7: Marine Mammals;
 - > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
 - > Vlaamse Banken SCI site information³⁶.
- 18.1.2 The site is designated for the following Annex I habitat:
- > Sandbanks which are slightly covered by sea water all the time;
 - > Reefs.
- 18.1.3 The following Annex II species:
- > Twaite shad (*Alosa fallax*);
 - > River lamprey (*Lampetra fluviatilis*);
 - > Sea lamprey (*Petromyzon marinus*);
 - > Harbour porpoise (*Phocoena phocoena*);
 - > Harbour (common) seal (*Phoca vitulina*); and
 - > Grey seal (*Halichoerus grypus*).
- 18.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and
 - > Disturbance at haul out (construction, operations and maintenance and decommissioning).
- 18.1.5 Potential for LSE has been identified for twaite shad (*Alosa fallax*) under the following scenarios:
- > Increase in underwater noise (construction and decommissioning).

³⁵ <http://natura2000.eea.europa.eu/natura2000/SDF.aspx?site=BEMNZ0001#3>

³⁶ <http://natura2000.eea.europa.eu/natura2000/SDF.aspx?site=BEMNZ0001#3>

18.1.6 Additional information for the Vlaamse Banken SCI can be found in the Natura 2000 data form³⁷; no information on conservation status or conservation targets for the site features have been sourced. Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

³⁷ <http://natura2000.eea.europa.eu/natura2000/SDF.aspx?site=BEMNZ0001#3>



LEGEND

- Order Limits
- Site of Community Importance



Data Source:
Eel, Garvin, GEBCO, NOAA NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Vlaamse Banken SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **18.1**

SCALE: 1:50,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N

**FIVE
ESTUARIES**
OFFSHORE WIND FARM

19 COLNE ESTUARY (MID-ESSEX COAST PHASE 2) RAMSAR

DISTANCE TO:

- > Array: 66.62 km
- > Offshore export cable corridor (ECC): 10.89 km.
- > Onshore ECC: 7.3 km

19.1.1 A short, branching estuary with five tidal arms flowing into the main river channel. The site includes an intertidal zone of mudflat communities. The Colne Estuary Ramsar is 7.2 km from the VE onshore ECC. Site and citation information can be found in the Colne Estuary RIS³⁸. The receptor group 'onshore ecology' is relevant to the site. Key literature sources, including relevant project literature, are as follows:

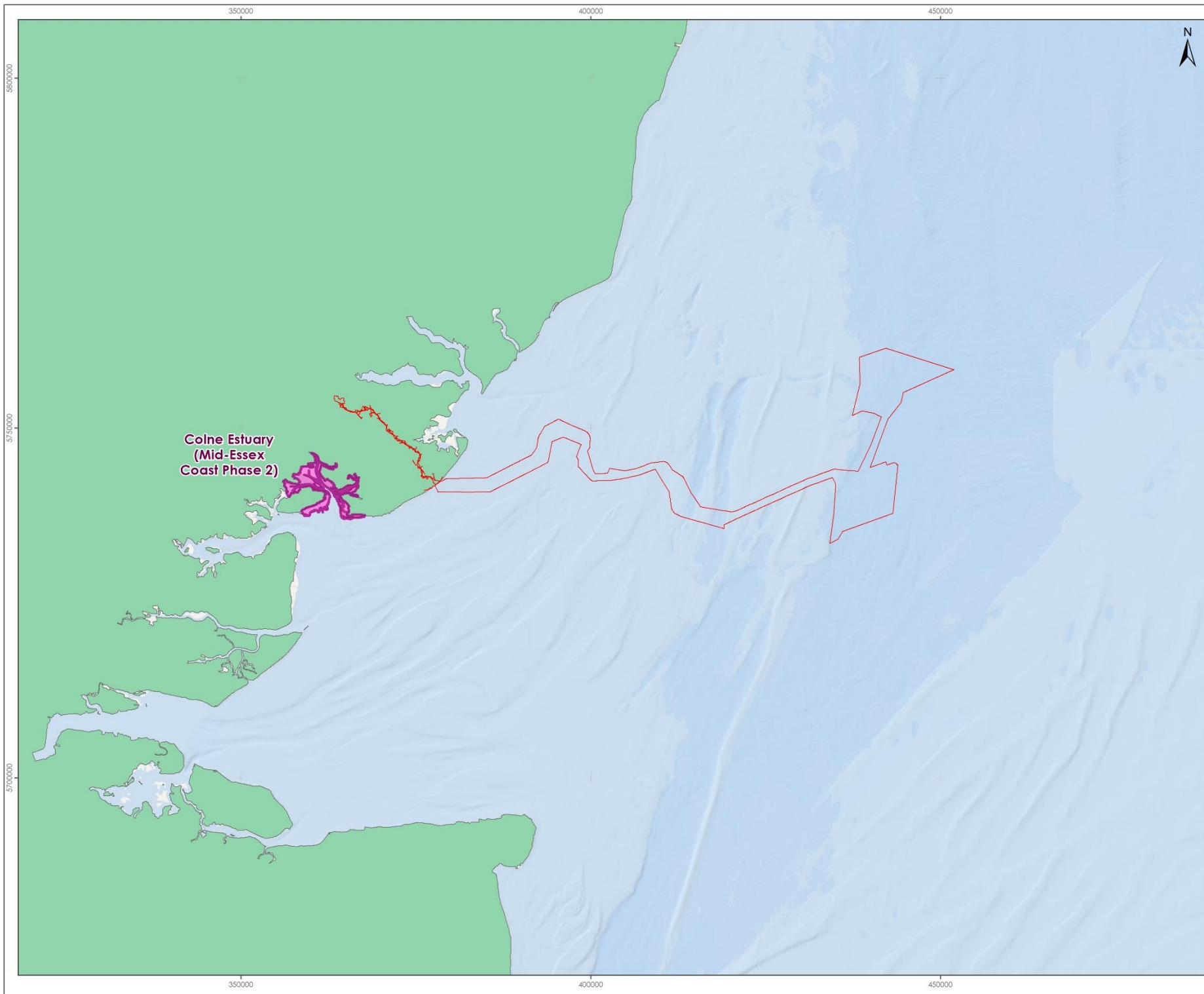
- > Volume 3, Chapter 4: Onshore Biodiversity and Nature Conservation;
- > Colne Estuary Ramsar RIS.

19.1.2 The Ramsar criteria for which the site is designated, along with qualifying species:

- > Ramsar criterion 1: The site is important due to the extent and diversity of saltmarsh present. This site, and the four other sites in the Mid-Essex Coast complex, includes a total of 3,237ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.
- > Ramsar criterion 2: The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species.
- > Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.
- > Ramsar criterion 5: Assemblages of international importance;
- > Waterfowl
- > Ramsar criterion 6: Species/populations occurring at levels of international importance.
- > Over winter:
 - > Dark-bellied brent goose;
 - > Redshank;
 - > Waterbird assemblage;
 - > Wetland invertebrate assemblage;
 - > Wetland plant assemblage; and
 - > Saltmarsh.

³⁸ chrome-extension://efaidnbmnnnnibpcajpcglclefindmkaj/https://jncc.gov.uk/jncc-assets/RIS/UK11015.pdf

- 19.1.3 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.
- 19.1.4 Potential for LSE has been identified for all the above species considered under Ramsar criterion 5 and 6 under the following scenarios:
- > Loss of foraging and roosting habitat outside the SPA (construction);
 - > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
 - > Water quality: pollution from site run-off affecting prey availability (construction and decommissioning);
 - > Decreases in water quantity (construction); and
 - > Decrease in air quality (construction and decommissioning).



LEGEND

Order Limits

Ramsar Site



Data Source:
SfL, Geosyn, GESCO, NOAA/NOEC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Colne Estuary Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **19.1**

SCALE: 1:50000 PLOT SIZE: A3 DATA: WGS84 PROJECTION: UTM31N

**FIVE
ESTUARIES**
OFFSHORE WIND FARM

20 THANET COAST AND SANDWICH BAY SPA

DISTANCE TO:

- > Array: 57.69 km
- > Offshore export cable corridor (ECC): 45.81 km.
- > Onshore ECC: 47.19 km

20.1.1 The Thanet Coast and Sandwich Bay is located across the north and east Kent coast stretching from Swalecliffe to Deal. The site starts at Long Rock, Swalecliffe and barring small stretches (Hampton to the end of Neptunes arm at Herne Bay, Viking Bay and Ramsgate Main sands to the end of Ramsgate harbour) spans the entirety of the coastline in a narrow band. The site expands to incorporate the whole of Pegwell Bay and the River Stour up to the industrial estate at Sandwich. An additional section in the Lydden valley is also included. A large proportion of the site is intertidal consisting of large areas of intertidal mud and sand flats at Pegwell, Minnis and Sandwich Bay, with shingle and rocky shores, saltmarsh habitats, lagoons and intertidal shingle habitats.

20.1.2 The SPA is 57.64 km from the VE array area. Site and citation information can be found in the Thanet Coast and Sandwich Bay SPA Citation and Conservation Objectives.³⁹

20.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Golden plover (non-breeding), 1,980 individuals (1985-86 to 1989-90). Not screened in (LSE can be discounted, see screening report for details);
- > Turnstone (non-breeding) 1,340 individuals (1986-87 to 1990-91). Not screened in (LSE can be discounted, see screening report for details); and
- > Little tern (breeding), 30 pairs (1990). Based on initial information, little tern was screened in for risk of collision on migration during O&M in the screening report. However, evidence shows that little tern are a strictly coastal, rather than marine species; they are the most inshore of all tern species, are found in shallow waters on passage, foraging no further than 15km offshore (BirdLife International, 2022). WWT & MacArthur Green (2014) found that little tern migrate within 10km of the shoreline. In addition, little tern migrate to and from west Africa (Wright *et al.* 2012), and as the SPA is located south of VE, the species can therefore be considered highly unlikely to have connectivity with the VE array area on migration, and as such, LSE can be discounted in relation to both alone and in-combination effects.

20.1.4 The Conservation Objectives³⁹ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is

³⁹ European Site Conservation Objectives for Thanet Coast & Sandwich Bay SPA (UK9012071).
<http://publications.naturalengland.org.uk/publication/6009926887407616>. (Accessed October 2022).

maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

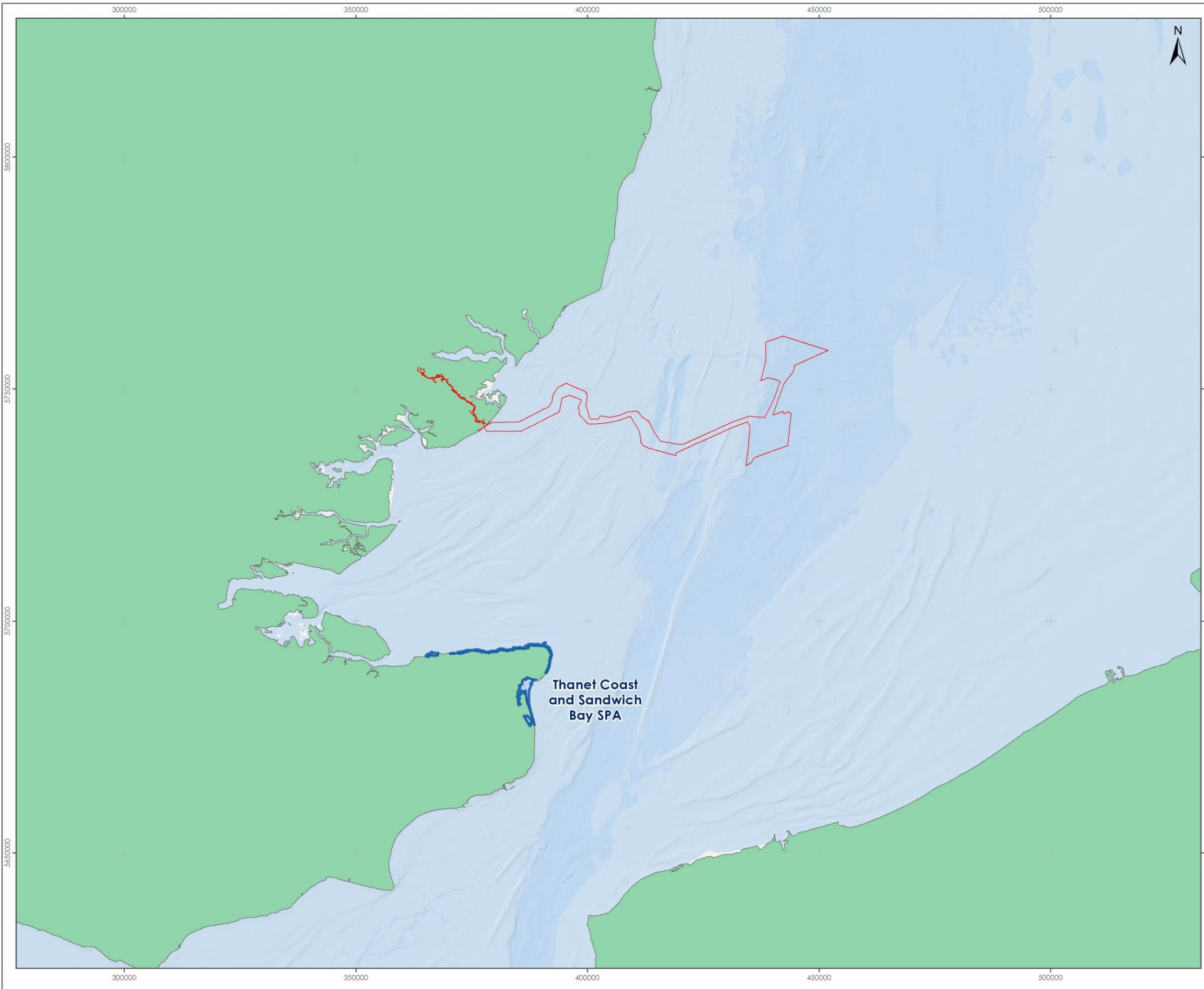
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

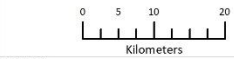
The population of each of the qualifying features, and,

The distribution of the qualifying features within the site”.



LEGEND

-  Order Limits
-  Special Protection Area



Data Source:
Est. Garmin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Thanet Coast and Sandwich Bay SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **20.1**

SCALE: 1:50,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



21 DOGGERSBANK (NETHERLANDS) SAC

DISTANCE TO:

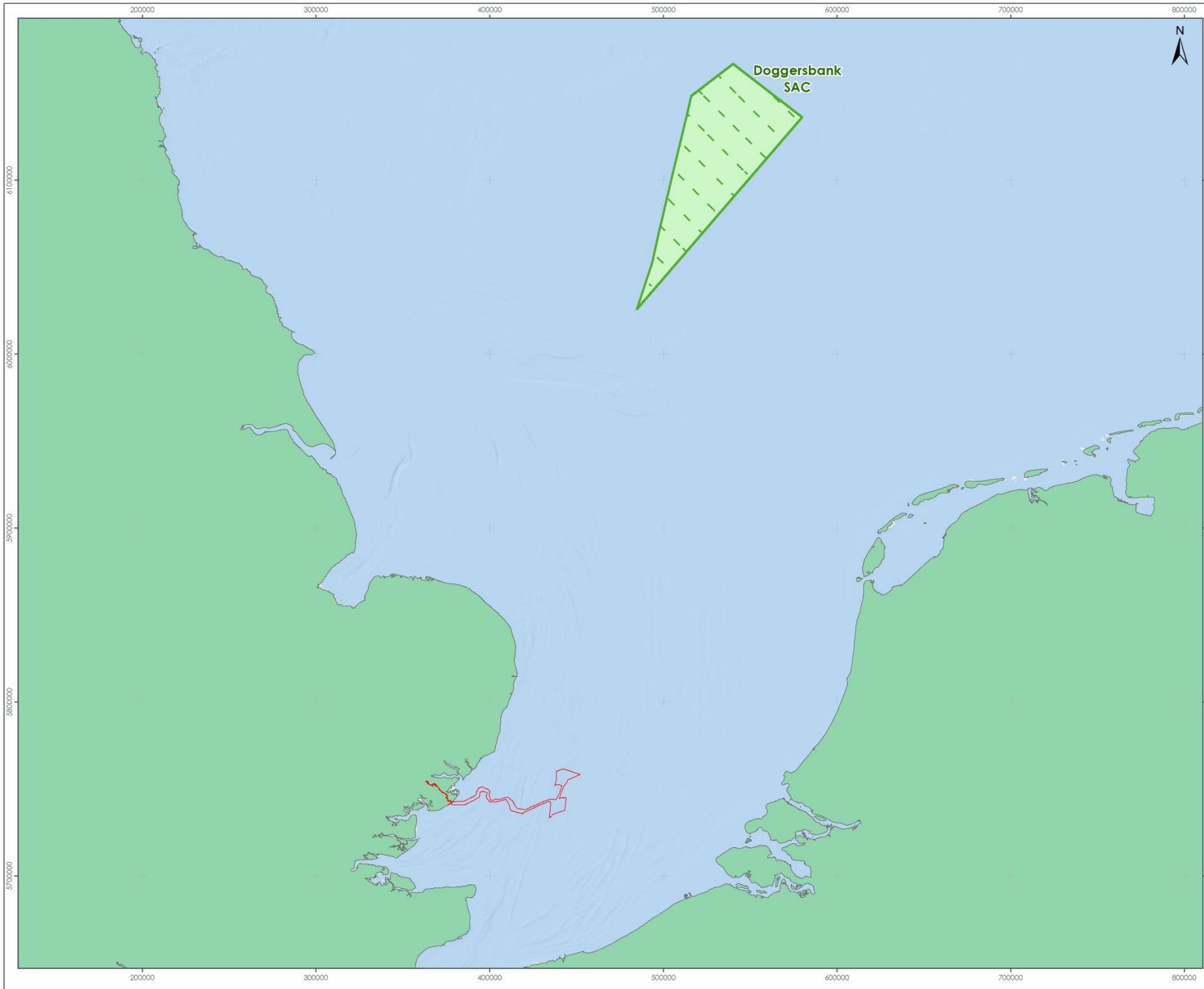
- > Array: 268 km
 - > Offshore export cable corridor (ECC): 274 km.
 - > Onshore ECC: 296 km
- 21.1.1 The Doggersbank SAC is located in the northern part of the Dutch North Sea and covers almost 4,745 km². The Dutch part of the Dogger Bank is part of the sandbank that extends over the British, Dutch, German and Danish Continental Shelves. It is an example of a shallow, permanently flooded sandbank, with the depth varying from 20 to 40 m. The receptor group 'marine mammals' is relevant to the Doggersbank SAC. Key literature sources, including relevant project literature, are as follows:
- > Volume 2, Chapter 7: Marine Mammals;
 - > Volume 4, Annex 4.7.1: Marine Mammals Technical Baseline;
 - > Doggersbank SAC site information (in Dutch)⁴⁰.
- 21.1.2 The site is designated for the following Annex I habitat:
- > Sandbanks which are slightly covered by seawater all the time.
- 21.1.3 The following Annex II species:
- > Harbour porpoise (*Phocoena phocoena*);
 - > Harbour (common) seal (*Phoca vitulina*); and
 - > Grey seal (*Halichoerus grypus*).
- 21.1.4 Due to its shallow depth, orientation and scale, Dogger Bank has a major effect on marine processes. The fauna north of the Dogger Bank differs considerably from that of the southern North Sea. Tidal currents and wave action cause intense water mixing above the shallow parts of the bank. Dogger Bank is more productive than the surrounding areas due to high benthic primary production and strong growth of organisms in the water column.
- 21.1.5 Potential for LSE has been identified for harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and
 - > Disturbance at haul out (construction, operations and maintenance and decommissioning).

⁴⁰<https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=13&id=n2k164&topic=introductie>

21.1.6 Further information for the Doggersbank SAC can be found on the Ministry of Agriculture, Nature and Food Quality website⁴¹, and includes national conservation status and conservation targets for the site features. For all relevant features national conservation status is identified as 'moderately favourable'. The targets applicable to features for which potential LSE was identified are listed below:

- > Conserve the area and quality of supporting habitat; and
- > Conserve the population size.

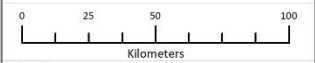
⁴¹<https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=13&id=n2k164&topic=doelstelling>



LEGEND

Order Limits

Special Area of Conservation



Data Source:
Eti, Gornitz, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Doggersbank (Netherlands) SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 21.1

SCALE: 1:2,000,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



22 FARNE ISLANDS SPA

DISTANCE TO:

- > Array: 472.54 km
- > Offshore export cable corridor (ECC): 461.41 km.
- > Onshore ECC: 446.28 km

22.1.1 The Farne Islands are a group of low-lying islands 2-6 km off the coast of Northumberland in northeast England. The islands are important as nesting areas for these birds, especially terns, gulls and auks. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Sea.

22.1.2 The SPA is 472.54 km from the VE array area. Site and citation information can be found in the Farne Island SPA Citation and Conservation Objectives.⁴²

22.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Common tern (breeding) 183 pairs (citation 1985). Not screened in (LSE can be discounted, see screening report for details).
- > Arctic tern (breeding) 2,003 pairs (2010-2014). Not screened in (LSE can be discounted, see screening report for details).
- > Roseate tern (breeding) 13 pairs (citation 1985). Not screened in (LSE can be discounted, see screening report for details).
- > Sandwich tern (breeding) 862 pairs (2010-2014). Not screened in (LSE can be discounted, see screening report for details)
- > Common guillemot (hereafter referred to as 'guillemot') (breeding) 32,875 pairs (2010-2014). Not screened in during breeding season (LSE can be discounted, see screening report for details). Screened in for risk disturbance and displacement during the non-breeding bio-season.
- > Seabird assemblage. Razorbill, whilst not a feature of the site, is part of the seabird assemblage and based on NE advice, was screened in for risk of disturbance and displacement.

22.1.4 The conservation objectives for the site are:

"With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

The extent and distribution of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

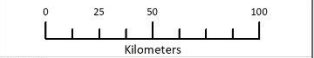
⁴² European Site Conservation Objectives for Farne Islands Special Protection Area (UK9006021)
<http://publications.naturalengland.org.uk/publication/4521874151178240> (Accessed November 2022)

The population of each of the qualifying features, and, The distribution of the qualifying features within the site.”



LEGEND

- Order Limits
- Special Protection Area



Data Source:
Eti, Gornitz, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Farne Islands SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **22.1**

SCALE: 1:2,000,000	PLOT SIZE: A3	EXTENT: WGS84	PROJECTION: UTM31N
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23 GREATER WASH SPA

DISTANCE TO:

- > Array: 62.70 km
- > Offshore export cable corridor (ECC): 69.41 km.
- > Onshore ECC: 89.71 km

23.1.1 The Greater Wash SPA is located in the mid-southern North Sea between Bridlington Bay in the north and the Outer Thames Estuary SPA in the south. The SPA boundary encompasses offshore areas identified as containing high densities, or encompassing breeding season foraging ranges of the qualifying bird species. To the north, off the Holderness coast in Yorkshire, seabed habitats primarily comprise coarse sediments, with occasional areas of sand, mud and mixed sediments. Subtidal sandbanks occur at the mouth of the Humber Estuary, primarily comprising sand and coarse sediments. Offshore, soft sediments dominate, with extensive areas of subtidal sandbanks off The Wash as well as north and east Norfolk coasts. Closer inshore at The Wash and north Norfolk coast, sediments comprise a mosaic of sand, muddy sand, mixed sediments and coarse sediments, as well as occasional Annex I reefs. The area off the Suffolk coast continues the mosaic habitats mostly dominated by soft sediment.

23.1.2 The SPA is 62.77 km from the VE array area. Site and citation information can be found in the Greater Wash SPA Citation and Conservation Objectives.⁴³

23.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Red-throated diver (Non-breeding) 1,407 individuals (2002/03 - 2005/06). Not screened in (LSE can be discounted, see screening report for details).
- > Common scoter (Non-breeding) 3,449 individuals (2002/03 – 2007/08). Not screened in (LSE can be discounted, see screening report for details).
- > Little gull (Non-breeding) 1,255 individuals (2002/03 - 2005/06). In the screening report, little gull was screened in:
 - > During construction: disturbance and displacement, and changes to prey availability;
 - > O&M: disturbance and displacement, risk of collision and changes to prey availability; and
 - > During decommissioning: disturbance and displacement, and changes to prey availability.

However, this species has subsequently been screened out based on the fact that Greater Wash SPA is located >62km north of both the VE

⁴³ European Site Conservation Objectives for the Greater Wash Special Protection Area (UK9020329) <http://publications.naturalengland.org.uk/publication/4597871528116224> (Accessed November 2022)

array and ECC. As the species breeds north of the SPA, there is no interaction with the VE array and ECC.

- > Sandwich tern (Breeding) 3,852 pairs (2010-14). Not screened in (LSE can be discounted, see screening report for details).
- > Common tern (Breeding) 510 pairs (2010-14). Not screened in (LSE can be discounted, see screening report for details).
- > Little tern (Breeding) 798 pairs (2009-2013). Not screened in (LSE can be discounted, see screening report for details).

23.1.4 The Conservation Objectives for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

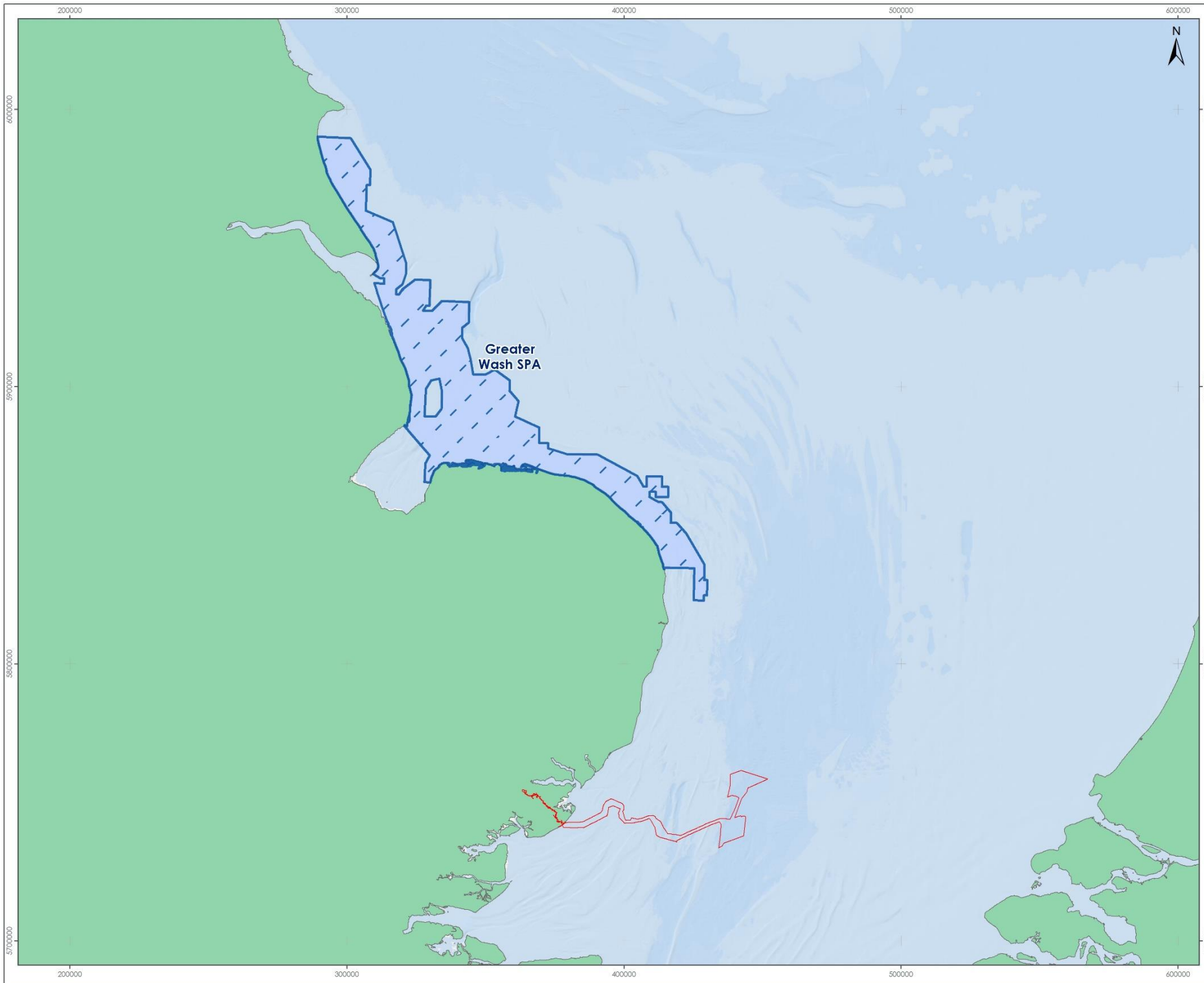
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

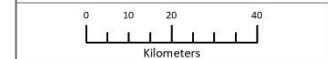
The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

The distribution of the qualifying features within the site”.



- LEGEND**
- Order Limits
 - Special Protection Area



Data Source:
Eri, Garmin, GBCC, NOAA/NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Greater Wash SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **23.1**

SHEET: 11/25/08	PLOT REF: A3	DATUM: WGS84	PROJECTION: UTM31N
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24 FLAMBOROUGH AND FILEY COAST SPA

DISTANCE TO:

- > Array: 275.5 km
- > Offshore export cable corridor (ECC): 264.61 km.
- > Onshore ECC: 251.31 km

24.1.1 The Flamborough and Filey Coast SPA straddles the border of East Yorkshire and North Yorkshire at the western coast of the North Sea. It has two sections - Flamborough to the south, and Filey to the north - both encompassing clifftop, sea cliff and intertidal rock habitats. The expanse of Filey Bay divides these two inland sections, but is not included in the designation.

24.1.2 The SPA is 275.5 km from the VE array area. Site and citation information can be found in the Flamborough and Filey Coast SPA Citation and Conservation Objectives.⁴⁴

24.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features. The citation population and most recent colony counts are shown. For each feature, it is specified whether it was screened in for assessment.

- > Gannet (breeding), 8,469 pairs (2008-2012). Screened in for:
 - > During construction: Direct disturbance and displacement;
 - > During O&M: Risk of collision; direct disturbance and displacement; and
 - > During decommissioning: Direct disturbance and displacement.
- > Kittiwake (non-breeding), 44,520 pairs (2008-2011). Screened in for risk of collision on migration during O&M.
- > Guillemot (non-breeding), 41,607 pairs (2008-2011). Not screened in during breeding season (LSE can be discounted, see screening report for details). Screened in for risk of disturbance and displacement during non-breeding season.
- > Razorbill (non-breeding), 10,570 pairs (2008-2012). Not screened in during breeding season (LSE can be discounted, see screening report for details). Screened in for risk of disturbance and displacement during non-breeding season.
- > Seabird assemblage.

24.1.4 The Conservation Objectives⁴⁴ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

⁴⁴ [European Site Conservation Objectives for Flamborough and Filey Coast SPA \(UK9006101\).](http://publications.naturalengland.org.uk/publication/5400434877399040)
<http://publications.naturalengland.org.uk/publication/5400434877399040> (Accessed October 2022).

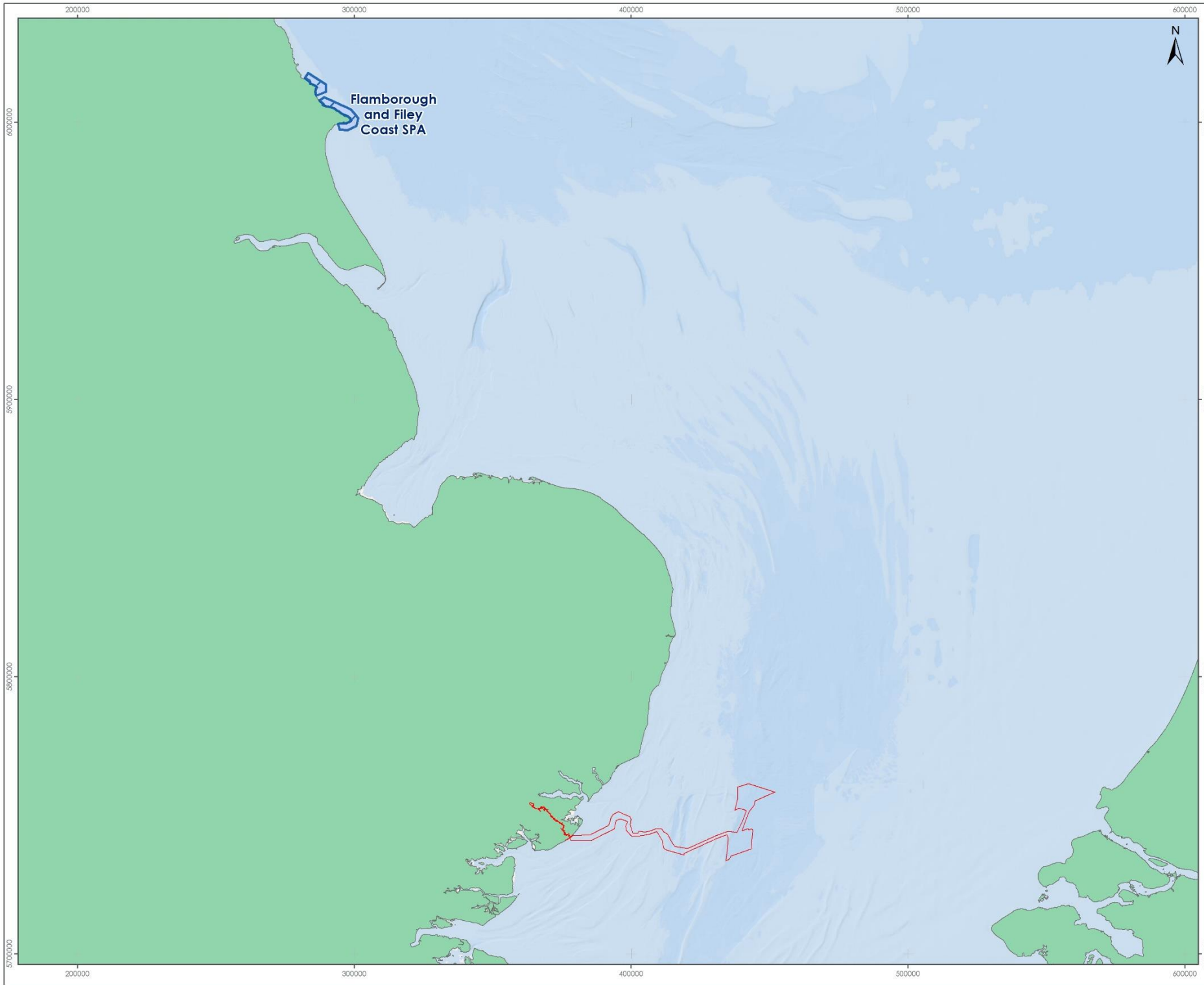
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

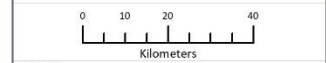
The population of each of the qualifying features, and,

The distribution of the qualifying features within the site”.



LEGEND

- Order Limits
- Special Protection Area



Data Source:
Eti, Gormly, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
Flamborough and Filey Coast SPA
in relation to Five Estuaries

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 24.1

SCALE: 1:1,250,000	PLOT SIZE: A3	EXTENT: WGS84	PROJECTION: UTM31N
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25 HAMFORD WATER SAC

DISTANCE TO:

- > Array: 54.73 km
- > Offshore export cable corridor (ECC): 4.04 km.
- > Onshore ECC: 0.82 km

25.1.1 The Hamford Water area is a large tidal embayment between Walton-on-the-Naze and Dovercourt on the north Essex coastline in eastern England. The site is a large, shallow basin, protected by The Naze headland, which supports a wide range of habitats, including tidal creeks, mud and sand flats, grasslands, beaches, a large extent of saltmarsh and multiple islands.

25.1.2 The SAC is 0.71 km from the VE onshore ECC. Site and citation information can be found in the Hamford Water SAC Citation and Conservation Objectives⁴⁵ The receptor group 'onshore ecology' is relevant to the Hamford Water SAC. Key literature sources, including relevant project literature, are as follows:

- > Volume 3, Chapter 4: Onshore Biodiversity and Nature Conservation;
- > Hamford Water SAC site information.

25.1.3 The site is designated for the following Annex II species:

- > Fisher's estuarine moth (*Gortyna borellii lunata*)

25.1.4 Potential for LSE has been identified for Fisher's estuarine moth (*Gortyna borellii lunata*) under the following scenarios:

- > Impacts on supporting populations, food plant and potential habitat outside SAC (construction and decommissioning);
- > Water quality: pollution from site run-off affecting habitat quality (construction and decommissioning);
- > Decreases in water quantity (construction and decommissioning); and
- > Decrease in air quality (construction and decommissioning).

25.1.5 The Conservation Objectives for the site⁴⁶ are as follows:

"Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

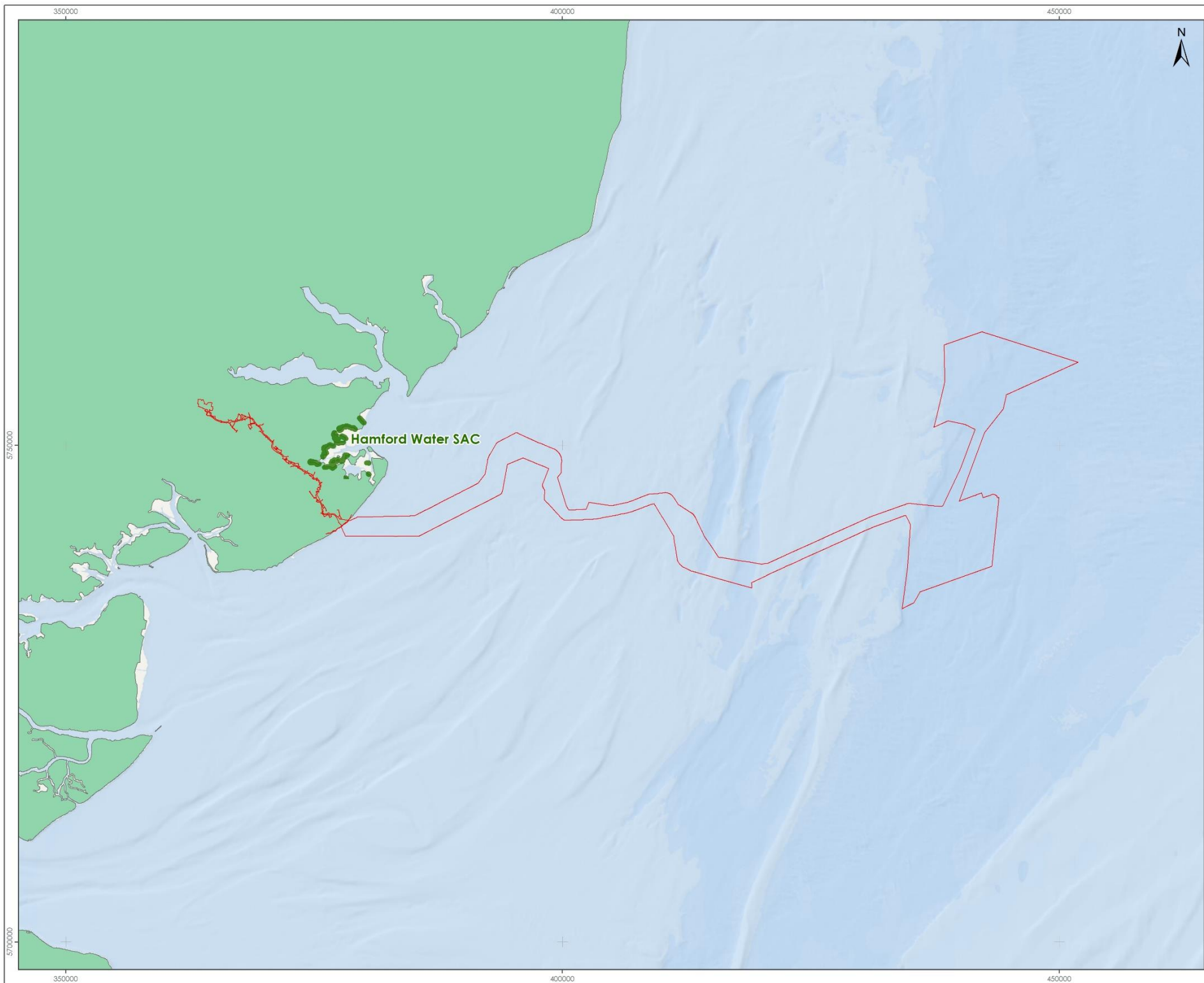
The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

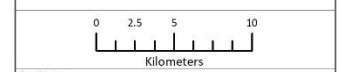
The distribution of the qualifying features within the site."

⁴⁵ <https://publications.naturalengland.org.uk/publication/6658670226046976> (Accessed April 2023).

⁴⁶ [Marine site detail \(naturalengland.org.uk\)](#)



- LEGEND**
- Order Limits
 - Special Area of Conservation



Data Source:
SOL, Geomir, GBSCD, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Hamford Water SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPB	WH

DRAWING NUMBER: **25.1**

SCALE:	1:100,000	PLOT SIZE:	A3	GRAPHIC:	WG584	PROJECTION:	UTM31N
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26 HAMFORD WATER SPA

DISTANCE TO:

- > Array: 51.17 km
- > Offshore export cable corridor (ECC): 3.16 km.
- > Onshore ECC: 0.80 km

26.1.1 The Hamford Water SPA is a large tidal embayment between Walton-on-the-Naze and Dovercourt on the north Essex coastline in eastern England. The site is a large, shallow basin, protected by The Naze headland, which supports a wide range of habitats, including tidal creeks, mud and sand flats, grasslands, beaches, a large extent of saltmarsh and multiple islands. The SPA includes a marine area in Pennyhole Bay beyond the mouth of Hamford Water, consisting of subtidal habitats and Pye Sands, an intertidal sandbank. An area of intertidal beach below the cliffs of The Naze is also included within the SPA.

26.1.2 The SPA is 51.04 km from the VE array area. Site and citation information can be found in the Hamford Water SPA Citation and Conservation Objectives.⁴⁷

26.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Little tern (breeding) 39 pairs (2010-2014). Based on initial information, the screening report screened in little tern for:
 - > Risk of disturbance and displacement due to work activity and vessel movements within the preferred offshore ECC only during construction. However, little tern were not detected during the bird surveys of the VE site (March 2019 – February 2021), and the ECC does not lie within MMF+1SD of the SPA (Thaxter *et al.*, 2012; Woodward *et al.*, 2019); and
 - > Risk of collision on migration during O&M. However, evidence shows that little tern are a strictly coastal, rather than marine species; they are the most inshore of all tern species, found in shallow waters on passage (BirdLife International, 2022). WWT & MacArthur Green (2014) found that little tern migrate within 10km of the shoreline. Furthermore, little tern migrate to and from west Africa (Wright *et al.* 2012), and the SPA is located south of VE.

Based on the information outlined above, the species can thus be considered highly unlikely to have connectivity with the VE array area and ECC, and as such, LSE can be discounted in relation to both alone and in-combination effects.

⁴⁷ [European Site Conservation Objectives for Hamford Water SPA - UK9009131.](http://publications.naturalengland.org.uk/publication/6658670226046976)
[http://publications.naturalengland.org.uk/publication/6658670226046976.](http://publications.naturalengland.org.uk/publication/6658670226046976) (Accessed October 2022).

- > A number of wintering duck and wader species considered as “onshore ecology” as part of the screening;
- > Avocet, Non-breeding;
- > Black-tailed godwit, Non-breeding;
- > Dark-bellied brent goose, Non-breeding;
- > Grey plover, Non-breeding;
- > Redshank, Non-breeding;
- > Ringed plover, Non-breeding;
- > Shelduck, Non-breeding;
- > Teal, Non-breeding;
- > All of the above species are screened in for the following:
 - > Loss of foraging and roosting habitat outside the SPA (construction);
 - > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
 - > Water quality: pollution from site run-off affecting prey availability (construction and decommissioning);
 - > Decreases in water quantity (construction); and
 - > Decrease in air quality (construction and decommissioning).

26.1.4 The Conservation Objectives⁴⁷ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

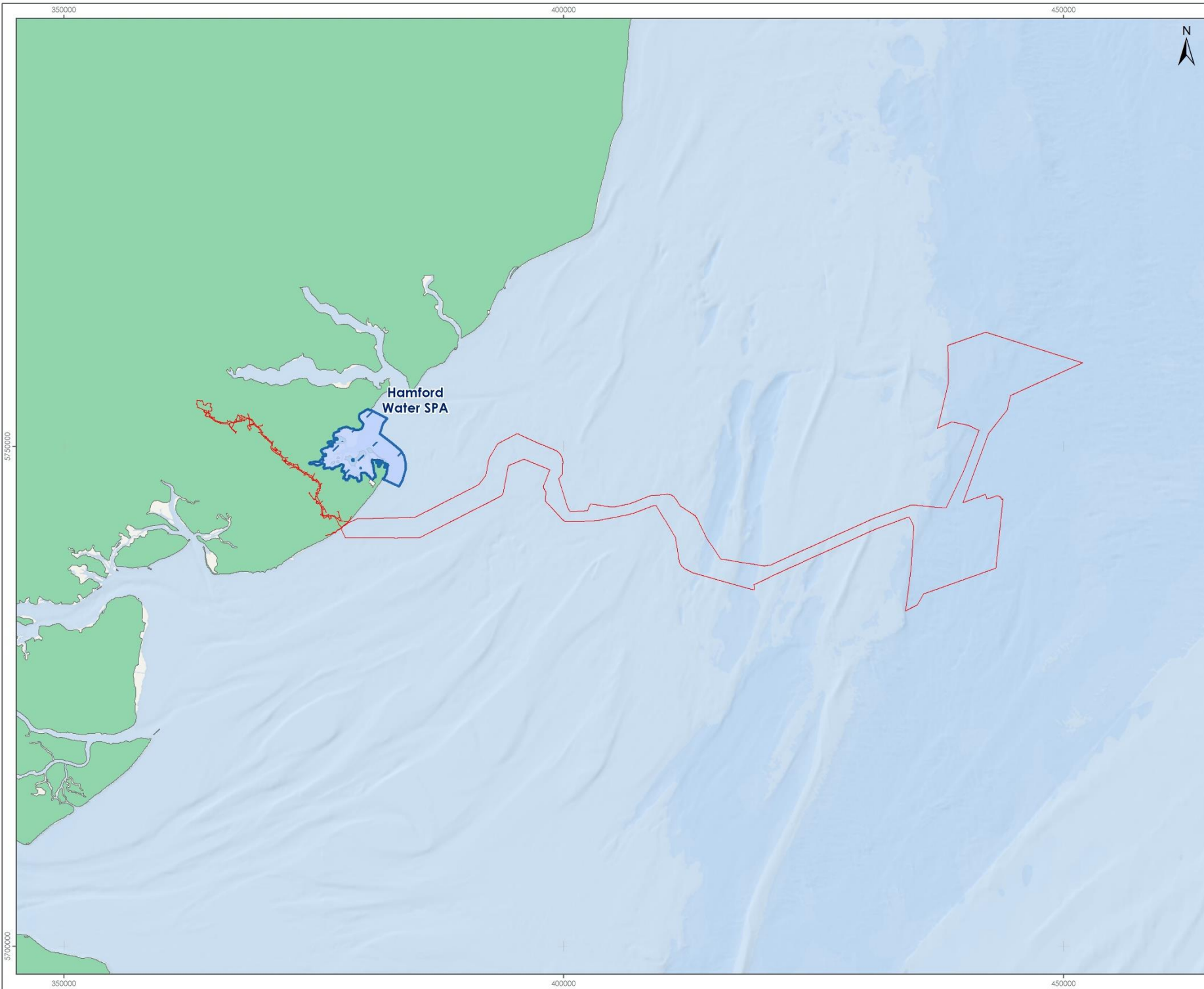
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

The distribution of the qualifying features within the site”.



- LEGEND**
- Order Limits
 - Special Protection Area



Data Source:
ES, Gemini, GEBCO, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Hamford Water SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **26.1**

SCALE: 1:250,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N

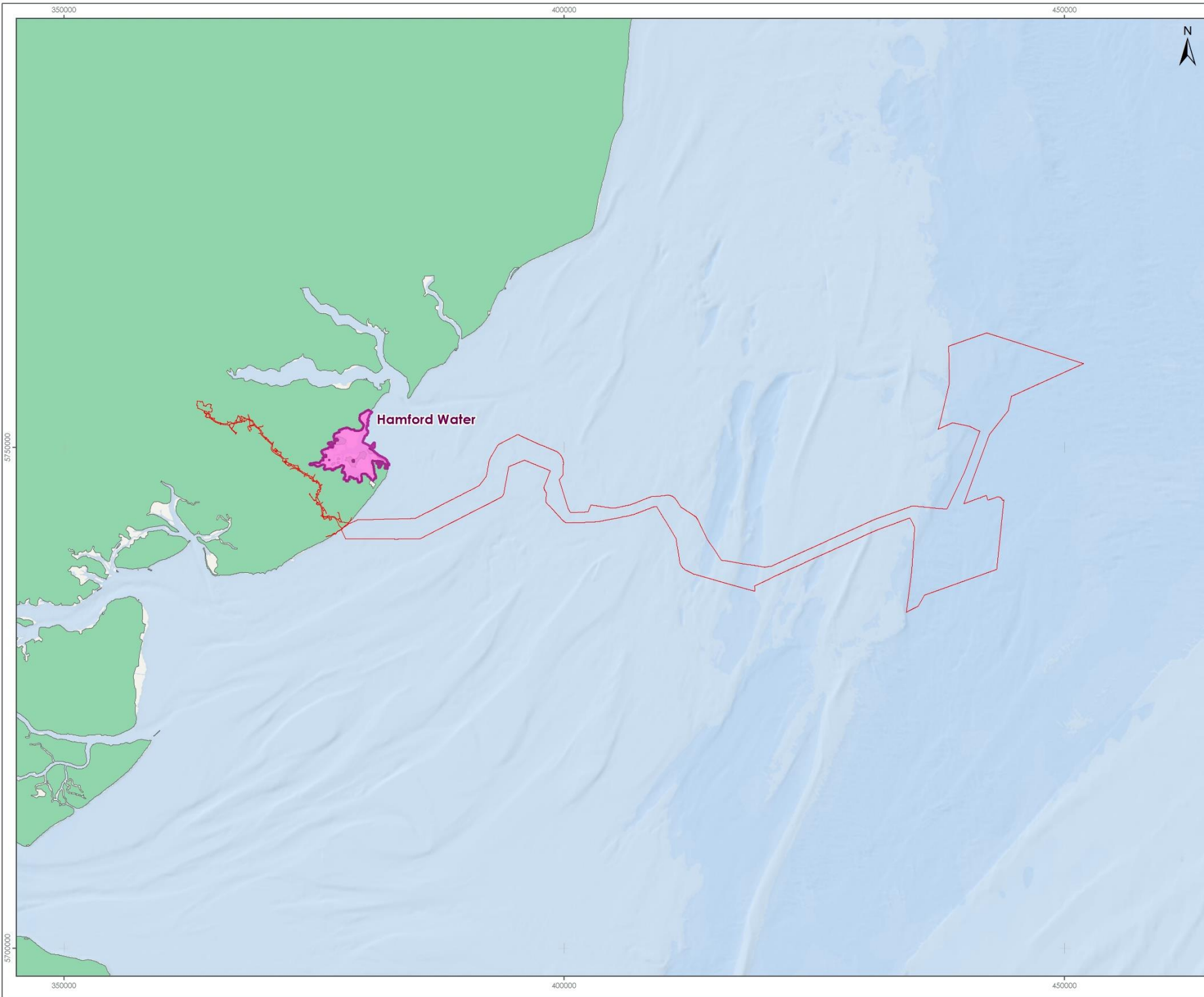


27 HAMFORD WATER RAMSAR

DISTANCE TO:

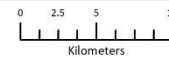
- > Array: 52.89 km
 - > Offshore export cable corridor (ECC): 3.70 km
 - > Onshore ECC: 0.81 km
- 27.1.1 The Hamford Water area is a large tidal embayment between Walton-on-the-Naze and Dovercourt on the north Essex coastline in eastern England. The site is a large, shallow basin, protected by The Naze headland, which supports a wide range of habitats, including tidal creeks, mud and sand flats, grasslands, beaches, a large extent of saltmarsh and multiple islands.
- 27.1.2 The Hamford Water Ramsar is 0.71 km from the VE onshore ECC. Site and citation information can be found in the Hamford Water RIS⁴⁸. The receptor group 'onshore ecology' is relevant to the site. Key literature sources, including relevant project literature, are as follows:
- > Volume 3, Chapter 4: Onshore Biodiversity and Nature Conservation;
 - > Hamford Water Ramsar RIS.
- 27.1.3 The site is designated for Important wintering populations of:
- > Black-tailed godwit
 - > Dark-bellied brent goose
 - > Redshank
 - > Ringed plover
- 27.1.4 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.
- 27.1.5 Potential for LSE has been identified for all the above species under the following scenarios:
- > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
 - > Water quality: pollution from site run-off affecting prey availability (construction and decommissioning);
 - > Decreases in water quantity (construction); and
 - > Decrease in air quality (construction and decommissioning).

⁴⁸ <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://jncc.gov.uk/jncc-assets/RIS/UK11028.pdf>



LEGEND

- Order Limits
- Ramsar Site



Data Source:
Eti, Google, GEBCO, NOAA NODC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Hamford Water Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **27.1**

SCALE	UNIT	PLOT SIZE	EXTENT	PROJECTION
1:100,000	A3	WG584	UTM31N	



28 DENGIE ESTUARY SPA

DISTANCE TO:

- > Array: 73.74 km
- > Offshore export cable corridor (ECC): 19.59 km.
- > Onshore ECC: 17.91 km

28.1.1 The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and silt flats, including several islands, shingle and shell beaches and extensive areas of saltmarsh. Site and citation information can be found in the Dengie (Mid-Essex Coast Phase 1) SAC Citation and Conservation Objectives⁴⁹ The receptor group 'onshore ecology' is relevant to the Dengie Estuary SAC.

28.1.2 The site is designated for the following Annex II species:

- > Dark bellied brent goose;
- > Red knot;
- > Hen harrier; and
- > Grey plover.

28.1.3 The Conservation Objectives for the site are as follows:

“Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

The extent and distribution of the habitats of the qualifying features

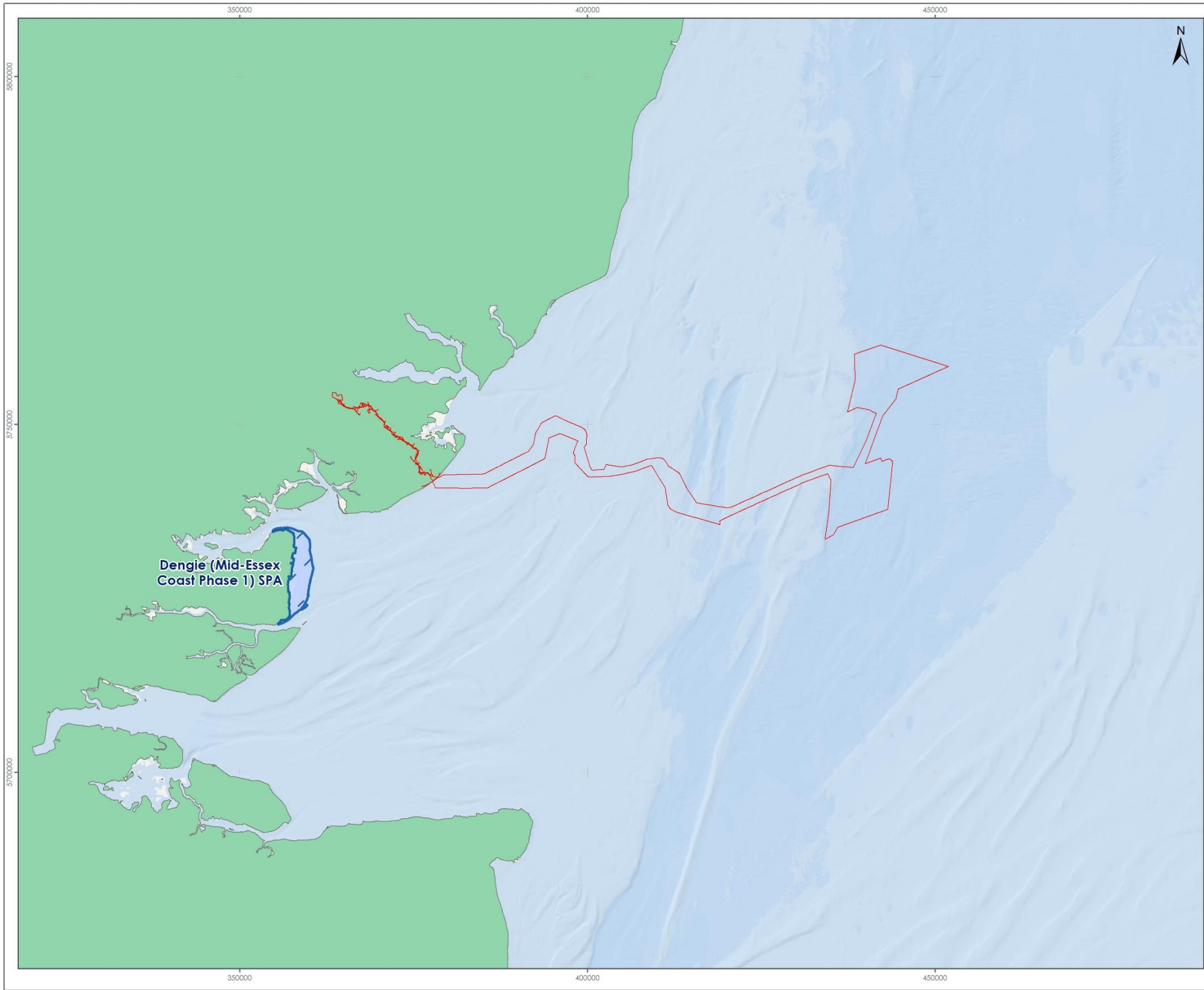
The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

The population of each of the qualifying features, and,

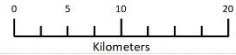
The distribution of the qualifying features within the site.”

⁴⁹ <https://publications.naturalengland.org.uk/publication/4829082877427712>



LEGEND

- Order Limits
- Special Protection Area



Data Source:
UK, Google, GEBCO, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Dengie Estuary SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BFHB	WH

DRAWING NUMBER: 28.1

SCALE: 1:800,000 | PLOT SIZE: A3 | DATUM: WGS84 | PROJECTION: UTM31N



29 DENGIE ESTUARY RAMSAR

DISTANCE TO:

- > Array: 73.74 km
- > Offshore export cable corridor (ECC): 19.59 km.
- > Onshore ECC: 17.91 km

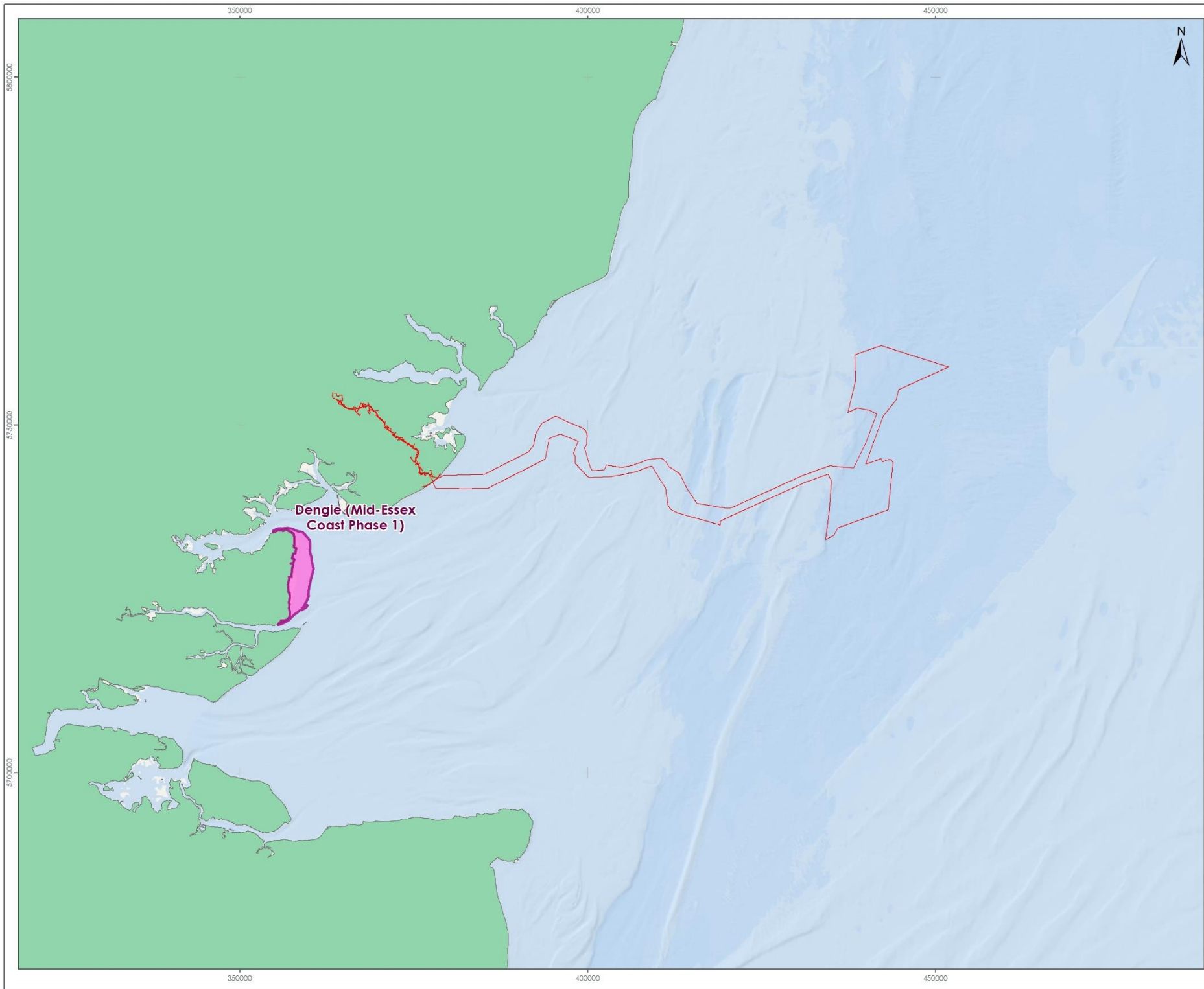
29.1.1 The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and siltflats, including several islands, shingle and shell beaches and extensive areas of saltmarsh. The Dengie component of the Mid-Essex Coast supports a number of rare plant and animal species. A range of land uses are recorded at Dengie including bait fishing, grazing, conservation, recreational hunting, and birdwatching and other recreation. Site and citation information can be found in the Dengie Estuary RIS⁵⁰. The receptor group 'onshore ecology' is relevant to the site.

29.1.2 The Ramsar criteria for which the site is designated, along with qualifying species:

- > Ramsar criterion 1: Qualifies by virtue of the extent and diversity of saltmarsh habitat present. Dengie, and the four other sites in the Mid-Essex Coast Ramsar site complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.
- > Ramsar criterion 2: Dengie supports a number of rare plant and animal species. The Dengie has 11 species of nationally scarce plants: sea kale *Crambe maritima*, sea barley *Hordeum marinum*, golden samphire *Inula crithmoides*, lax flowered sea lavender *Limonium humile*, the glassworts *Sarcocornia perennis* and *Salicornia pusilla*, small cord-grass *Spartina maritima*, shrubby sea-blite *Suaeda vera*, and the eelgrasses *Zostera angustifolia*, *Z. marina* and *Z. noltei*. The invertebrate fauna includes the following Red Data Book species: a weevil *Baris scolopacea*, a horsefly *Atylotus latistriatus* and a jumping spider *Euophrys browni*.
- > Ramsar criterion 3: This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.
- > Ramsar criterion 5: Assemblages of international importance;
- > Waterfowl
- > Ramsar criterion 6: Species/populations occurring at levels of international importance.
- > Over winter:
 - > Dark-bellied brent goose;
 - > Grey plover;
 - > Red knot; and
 - > Waterbird assemblage.

⁵⁰ <https://rsis.ramsar.org/RISapp/files/RISrep/GB651RIS.pdf>

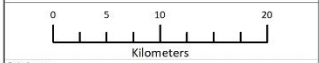
- 29.1.3 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.
- 29.1.4 Potential for LSE has been identified for all the above species considered under Ramsar criterion 6 under the following scenarios:
- > Risk of collision on migration.



LEGEND

Order Limits

Ramsar Site



Data Source:
Defra, Ordnance Survey, NOAA, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Dengie Estuary Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **29.1**

SCALE: 1:500,000 | NUT: A3 | DATUM: WGS84 | PROJECTION: UTM31N



30 HUMBER ESTUARY RAMSAR

DISTANCE TO:

- > Array: 197.29km
- > Offshore export cable corridor (ECC): 182.18km.
- > Onshore ECC: 167.67km

30.1.1 The Humber Estuary is located on the boundary between the East Midlands Region and the Yorkshire and the Humber Region and is the largest macro-tidal estuary on the British North Sea coast. The Humber Estuary Ramsar site covers an area of 37,987.8 ha. The receptor groups saltmarsh' and 'marine mammals' are relevant to the Humber Estuary Ramsar. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 5: Benthic Ecology;
- > Volume 4, Annex 4.5.1: Benthic and Intertidal Ecology Technical Report;
- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammals Technical Baseline;
- > Humber Estuary Information Sheet on Ramsar Wetlands (dated August 2007).

30.1.2 The site is designated for the following Ramsar criteria⁵¹:

- > Criterion 1: The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons;
- > Criterion 3: The site supports a breeding colony of grey seals (*Halichoerus grypus*) at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe are the most north-easterly breeding site in Great Britain of the natterjack toad (*Bufo calamita*);
- > Criterion 5: Assemblages of international importance - 153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001);
- > Criterion 6: species/populations occurring at levels of international importance: Eurasian golden plover (*Pluvialis apricaria altifrons* subspecies) wintering and on passage, red knot (*Calidris canutus islandica* subspecies) wintering and on passage, dunlin (*Calidris alpina alpina* subspecies) wintering and on passage, black-tailed godwit (*Limosa limosa islandica* subspecies) wintering and on passage, common redshank (*Tringa totanus brittanica* subspecies) wintering and on passage, common shelduck (*Tadorna tadorna*) wintering, bar-tailed godwit (*Limosa lapponica lapponica* subspecies) wintering; and
- > Criterion 8: The Humber Estuary acts as an important migration route for both river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) between coastal waters and their spawning areas.

⁵¹ <http://jncc.defra.gov.uk/pdf/RIS/UK11031.pdf>

30.1.3 Of these, potential for LSE has been identified for grey seal (*Halichoerus grypus*), and 23 bird species under the following scenarios:

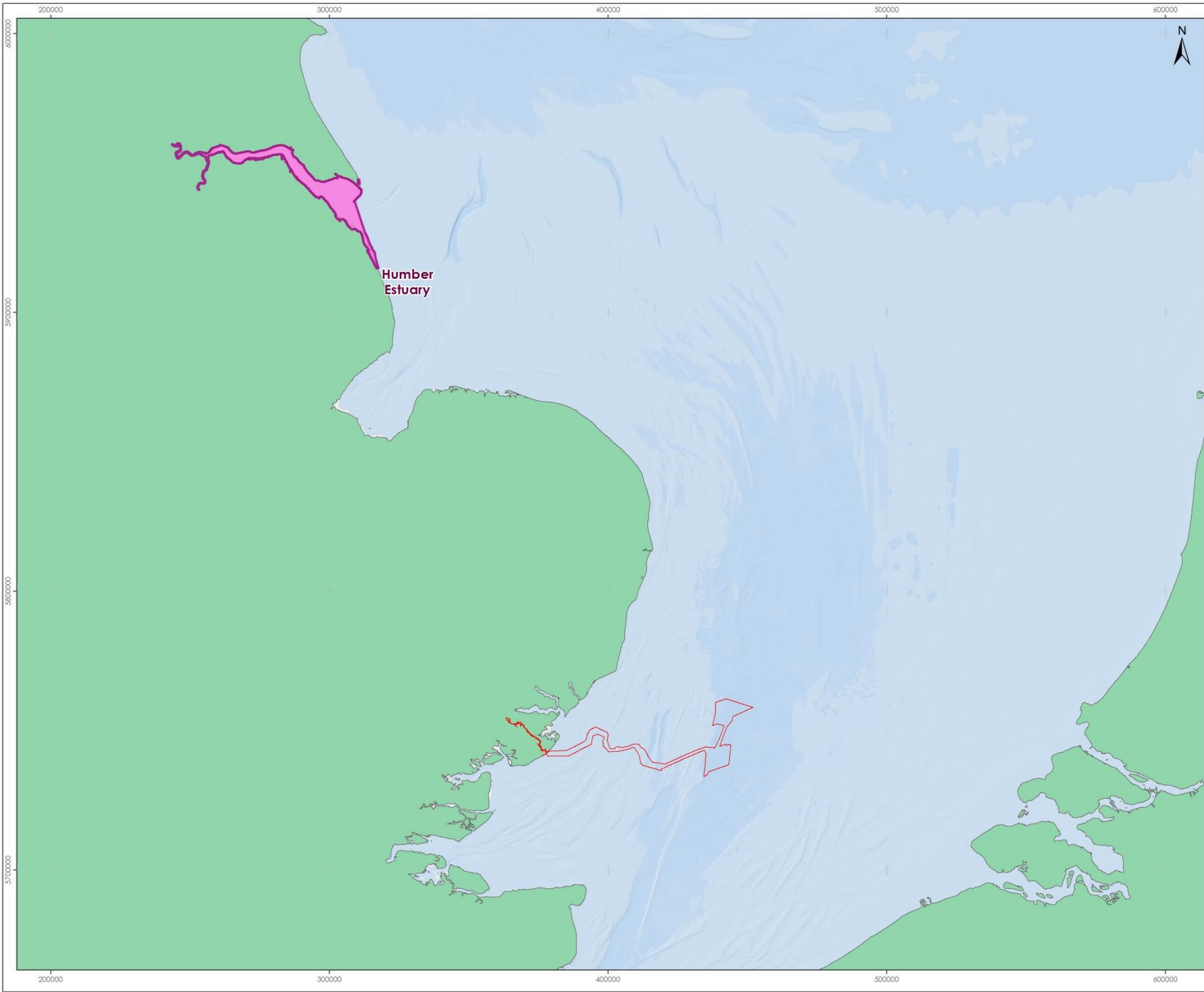
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning);
- > Disturbance at haul out (construction, operations and maintenance and decommissioning);
- > Collision risk – species present in numbers of international importance including; golden plover, dunlin, black-tailed godwit, bar-tailed godwit, redshank, shelduck, red knot (operations and maintenance); and
- > Collision risk – species present in numbers of national importance that make up part of the bird assemblage including; hen harrier, dark-bellied brent goose, teal, widgeon, goldeneye, avocet, oystercatcher, ringed plover, grey plover, lapwing, sanderling, curlew, whimbrel and turnstone (operations and maintenance).

30.1.4 Natural England has not published any information on the condition of the site. The Site Improvement Plan for Humber Estuary⁵² that includes the Humber Estuary Ramsar site was issued in July 2015. Reference to the criteria for which the site was designated and in context of the features screened in for potential LSE is as follows:

- > Undergrazing (saltmarsh);
- > Invasive species (saltmarsh);
- > Public access/disturbance (saltmarsh); and
- > Air pollution (saltmarsh).

30.1.5 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. However, no Conservation Objectives have yet been published for the Humber Estuary Ramsar. As the provisions on the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests. Given that the features screened in for the Humber Estuary Ramsar are the same as those screened in for the Humber Estuary SAC and SPA, it is therefore reasonable to apply the relevant Humber Estuary SAC and SPA conservation objectives equally here. Those conservation objectives are provided above

⁵²<http://publications.naturalengland.org.uk/publication/5427891407945728?category=5171232873906>
176



LEGEND

- Order Limits
- Ramsar Site

0 10 20 40
Kilometers

Scale Source:
Bn. Garmin, GBCC, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Humber Estuary Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **30.1**

SCALE: 1:1,000,000 GRID: A3 DATA: WGS84 PROJECTION: UTM31N

FIVE ESTUARIES
OFFSHORE WIND FARM

31 HUMBER ESTUARY SAC

DISTANCE TO:

- > Array: 203.32 km
- > Offshore export cable corridor (ECC): 188.56 km.
- > Onshore ECC: 174.21 km

31.1.1 The Humber Estuary SAC extends about 70 km from the mouth of the Humber, past the ports of Grimsby, Immingham, Hull and Goole and up to the limit of saline intrusion on the rivers Ouse and Trent and covers an area of around 366.57 km². The receptor groups 'benthic and intertidal habitats' and 'marine mammals' are relevant to the Humber Estuary SAC. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 5: Benthic Ecology;
- > Volume 4, Annex 4.5.1: Benthic and Intertidal Ecology Technical Report;
- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammals Technical Baseline;
- > Natural England Conservation Advice for Marine Protected Areas: Humber Estuary SAC and Supplementary Advice on Conservation Objectives (dated September 2017);
- > Humber Estuary Advice on Operations (dated March 2019) and Advice on Seasonality (dated March 2018);
- > Humber Estuary SAC citation (dated November 2009 v2); and
- > Environment Agency TraC Fish Counts ⁵³.

31.1.2 The site is designated for the following Annex I habitats:

- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- > Coastal lagoons;
- > Dunes with *Hippophae rhamnoides*;
- > Embryonic shifting dunes;
- > Estuaries;
- > Fixed dunes with herbaceous vegetation ("Grey dunes")
- > Mudflats and sandflats not covered by seawater at low tide
- > *Salicornia* and other annuals colonising mud and sand
- > Sandbanks which are slightly covered by sea water all the time; and
- > Shifting dunes along the shoreline with *Ammophila arenaria* ("White dunes").

31.1.3 Together with the following Annex II species:

- > Grey seal (*Halichoerus grypus*);

⁵³ <https://data.gov.uk/dataset/41308817-191b-459d-aa39-788f74c76623/trac-fish-counts-for-all-species-for-all-estuaries-and-all-years>

- > Sea lamprey (*Petromyzon marinus*); and
 - > River lamprey (*Lampetra fluviatilis*).
- 31.1.4 The Humber is the largest coastal plain estuary on the east coast of Britain. The range of salinity, substrate and exposure to wave action influences the estuarine habitats and the range of species that utilise them. Habitats within the Humber Estuary SAC include Atlantic salt meadows and a range of sand dune types in the outer estuary, together with subtidal sandbanks, extensive intertidal mudflats, *Salicornia* saltmarsh and coastal lagoons. As salinity declines upstream, reedbeds and brackish saltmarsh communities fringe the estuary. Significant fish species include river lamprey and sea lamprey, which breed in the River Derwent. Grey seals come ashore in autumn to form breeding colonies on the sandy shores of the south bank at Donna Nook.
- 31.1.5 The Humber estuary is a complex feature, which encompasses a number of other features, of which some have subfeatures associated with them, specifically 'Mudflats and sandflats not covered by seawater at low tide' and 'sandbanks which are slightly covered by sea water all the time'. No sub features are listed for the following habitat features: Atlantic salt meadows (*Glauco-Puccinellietalia maritima*), coastal lagoons, dunes with *Hippophae rhamnoides*, embryonic shifting dunes, fixed dunes with herbaceous vegetation ("grey dunes"), *Salicornia* and other annuals colonising mud and sand, shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes").
- 31.1.6 Of the designated features, potential for LSE has been identified for grey seal (*Halichoerus grypus*) only, under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and
 - > Disturbance at haul out (construction, operations and maintenance and decommissioning).
- 31.1.7 No information on feature condition is available following the 2016 Natural England's review⁵⁴.

⁵⁴<https://designatedsites.naturalengland.org.uk/Marine/MarineFeatureCondition.aspx?SiteCode=UK0030170&SiteName=humber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

- 31.1.8 Advice on operations was last updated in March 2020⁵⁵, including advice for offshore wind (during construction, operations and maintenance and decommissioning and cable laying, operations and maintenance and decommissioning). Management measures were issued in September 2017⁵⁶, with these limited to commercial fishing activities.
- 31.1.9 The Environment Agency TraC data, which consists of information collected from fisheries monitoring work on rivers, lakes, transitional and coastal waters, were accessed in June 2019 (database updated: 16 December 2019, but not required as the relevant features were screened out as no LSE at that point)⁵⁷. For the Humber Estuary (all sites) the database (which extends back to 1981) included just 4 records of river lamprey and none of sea lamprey.
- 31.1.10 The Site Improvement Plan for Humber Estuary⁵⁸ that includes the Humber Estuary SAC was issued in July 2015. Reference to the features of the SAC screened in for potential LSE is as follows:
- > Coastal squeeze (saltmarsh);
 - > Undergrazing (saltmarsh);
 - > Invasive species (saltmarsh);
 - > Public access/disturbance (saltmarsh); and
 - > Air pollution (saltmarsh).
- 31.1.11 The Supplementary Advice for the Humber Estuary SAC was updated in September 2019⁵⁹. The targets applicable to the features screened in for potential LSE (grey seal (*Halichoerus grypus*), Atlantic salt meadows and *Salicornia* and other annuals colonising mud and sand are listed below (not all being applicable to all three features screened in for potential LSE; where only applicable to specific features, this is noted):
- > Maintain the range and continuity of the saltmarsh habitats and its natural transitions within saltmarsh types and to other habitats seaward and landward;
 - > Restore the total extent of the saltmarsh habitats;
 - > Restore the ability for colonisation each year of the annual species that comprise the *Salicornia* and other annuals colonising mud and sand habitat;
 - > Restore the ability to achieve long-term fluctuations in the extent of Atlantic salt meadows in response to coastal processes;

⁵⁵<https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=humber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

⁵⁶<https://designatedsites.naturalengland.org.uk/SiteMMO.aspx?SiteCode=UK0030170&SiteName=humber%20estuary&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

⁵⁷<https://data.gov.uk/dataset/41308817-191b-459d-aa39-788f74c76623/trac-fish-counts-for-all-species-for-all-estuaries-and-all-years>

⁵⁸<http://publications.naturalengland.org.uk/publication/5427891407945728?category=5171232873906176>

⁵⁹<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030170&SiteName=humber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

- > Maintain the Grey seal population size within the site;
- > Maintain the reproductive and recruitment capability of Grey seal;
- > Maintain the presence and spatial distribution of Grey seal and their ability to undertake key life cycle stages and behaviours;
- > Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I saltmarsh features;
- > Maintain connectivity of the habitat within sites and the wider environment to ensure recruitment, and / or to allow movement of migratory species (grey seal);
- > Maintain naturally-occurring patterns of creeks and salt pans;
- > Maintain the degree of patterning of patches of bare mud of varying sizes in a mosaic with saltmarsh vegetation;
- > Maintain the availability and size range of those sediments typical of saltmarsh features at the site;
- > Maintain any desirable variation in elevation and / or topography across the site that supports Atlantis salt meadows;
- > The frequency / cover of the following undesirable species are maintained acceptable levels and are not encouraged by changes in surface condition, soils, nutrient levels or changes to hydrology: *Spartina anglica*;
- > Ensure the component vegetation communities of Atlantic salt meadows are referable to and characterised by the following National Vegetation Classification type (s);
- > Maintain the species composition of component vegetation communities and associated transitions, allowing for successional changes in response to natural processes (*Salicornia* and other annuals colonising mud and sand);
- > Maintain the full range of zonations (low-mid, mid, mid-upper and transitional zones) between component saltmarsh communities found in H133 (Atlantic salt meadows);
- > Maintain any existing zonations between H1310 and other adjacent saltmarsh or intertidal communities (*Salicornia* and other annuals colonising mud and sand);
- > Restrict the introduction and spread of non-native species and pathogens, and their impacts (Grey seal);
- > Maintain the extent and spatial distribution of the following supporting habitats: haulout sites for Grey seal;
- > Maintain the cover / abundance of preferred food items required by Grey seal;
- > Restore the ability of saltmarsh habitats, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site;
- > Maintain concentrations and deposition of air pollutants at below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (saltmarsh habitats);
- > Maintain the management measures (either within and / or outside the site boundary as appropriate) that are necessary to maintain / restore the

structure, functions and supporting processes associated with the saltmarsh habitat features;

- > Maintain adequate inputs of sediment in the water column from the sediment sources (offshore / eroding cliffs, etc) (saltmarsh habitats);
- > Maintain the morphological setting of the habitat within the wider estuarine and coastal system (saltmarsh habitats);
- > Maintain the natural physico-chemical properties of the water (Grey seal);
- > Maintain the pre-marsh biological processes that aid the stabilisation of intertidal sediment surfaces and support successful seedling establishment (*Salicornia* and other annuals colonising mud and sand);
- > Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement is not significantly altered or constrained (Grey seal);
- > Maintain both the sediment nutrient status to within typical values for the habitat and the processes that sustain effective nutrient cycling by the saltmarsh feature;
- > Maintain the sedimentary processes (suspended sediment, sediment transfer, etc) that sustain the elevation and topography of the marsh surface;
- > Maintain the degree of tidal immersion and emersion that supports the function of the saltmarsh habitat type;
- > Where the feature is dependent on estuarine water, ensure water quality and quantity is maintained to a standard that provides the necessary conditions to support saltmarsh features;
- > Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels (Grey seal);
- > Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features avoiding deterioration from existing levels (Grey seal); and
- > Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) in areas where this species is, or could be, present (Grey seal).

31.1.12 The Conservation Objectives for the site⁶⁰ are as follows:

“The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

the extent and distribution of qualifying natural habitats and habitats of the qualifying species;

⁶⁰<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030170&SiteName=humber%20estuary&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

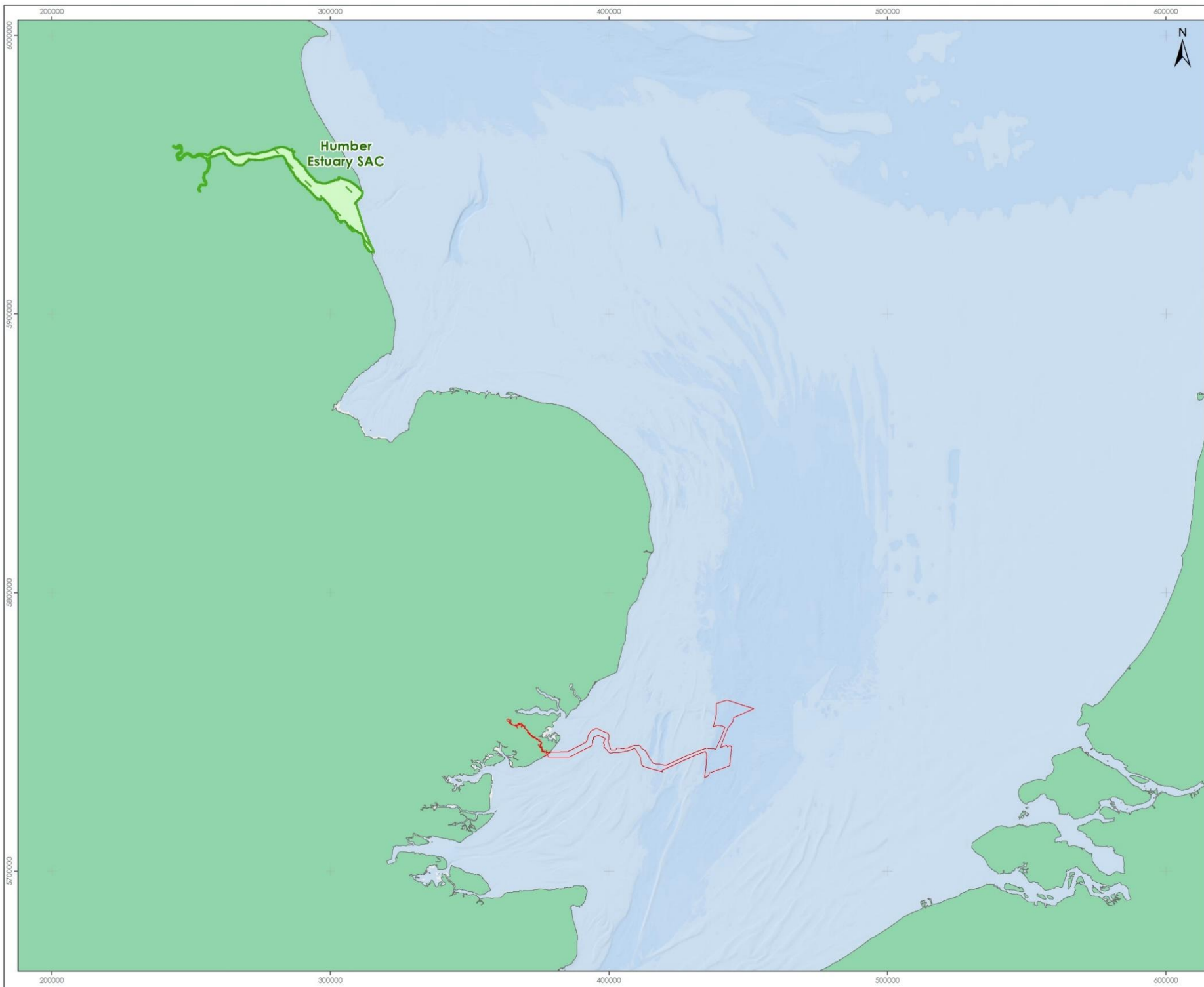
the structure and function (including typical species) of qualifying natural habitats;

the structure and function of the habitats of the qualifying species;

the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;

the populations of each of the qualifying species; and

the distribution of qualifying species within the site.”



LEGEND

- Order Limits
- Special Area of Conservation



Data Source:
Eri, Garmin, GEBCO, NOAA/NGDC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Humber Estuary SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **31.1**

SCALE: 1:1,000,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N

**FIVE
ESTUARIES**
OFFSHORE WIND FARM

32 KLAVERBANK SCI

DISTANCE TO:

- > Array: 212 km
- > Offshore export cable corridor (ECC): 217 km.
- > Onshore ECC: 248 km

32.1.1 The Klaverbank is located in the northwestern part of the Dutch North Sea. The sediments consist of (coarse) gravel and larger stones in alternation with coarse sand and shell material. The presence of coarse sediment types offers a specific living environment for, among other things, organisms bound to substrate. The structure of the habitat type is formed by the growth of organisms that are connected to the substrate, and by algae that can fix the loose sediment together. The receptor group 'marine mammals' is relevant to the Klaverbank SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Klaverbank SCI site information (in Dutch)⁶¹.

32.1.2 The site is designated for the following Annex I habitat:

- > Reefs.

32.1.3 The following Annex II species:

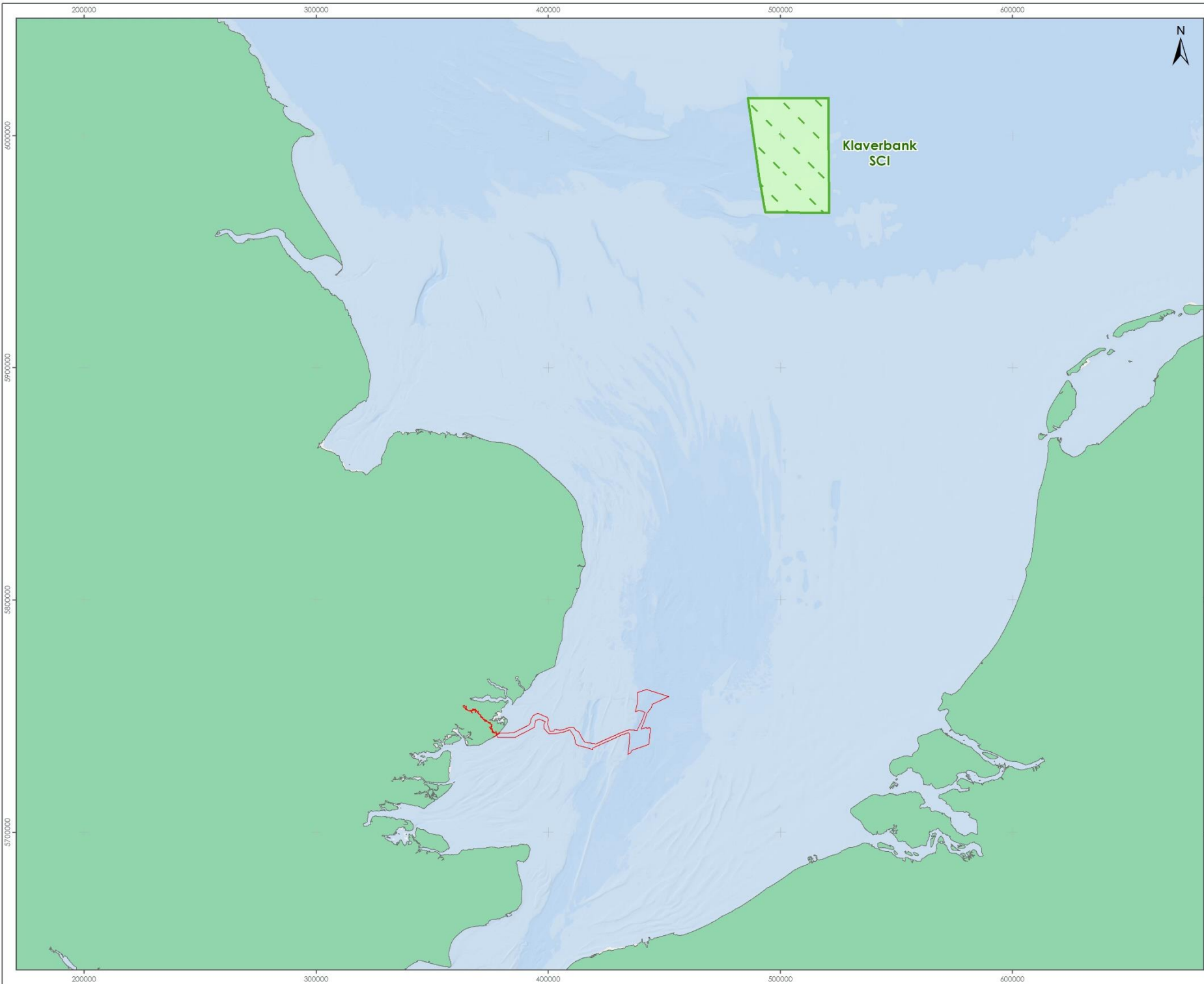
- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

32.1.4 Potential for LSE has been identified for harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) under the following scenarios:

- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

32.1.5 Additional information for the Klaverbank SCI can be found on the Ministry of Agriculture, Nature and Food Quality website⁶², and includes national conservation status and conservation targets for the site features. For all relevant features national conservation status is identified as 'moderately favourable'. The targets applicable to features for which potential LSE was identified are listed below:

- > Conserve the area and quality of supporting habitat; and
- > Conserve the population size.



LEGEND

- Order Limits
- Site of Community Importance



Data Source:
Eel, Garmin, GBCC, NOAA/NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Klaverbank SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **32.1**

SCALE: 1:1,000,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N



33 MINSMERE-WALBERSWICK RAMSAR

DISTANCE TO:

- > Array: 41.88 km
- > Offshore export cable corridor (ECC): 37.00 km
- > Onshore ECC: 49.86 km

33.1.1 The Minsmere-Walberswick Ramsar is situated on the Suffolk coast. The area contains a variety of habitats, including grazing marsh (both coastal and freshwater), coastal reedbeds, saltmarsh, lowland heathland, woodland, intertidal mud and mixed sediment.

33.1.2 The Ramsar is 41.75 km from the VE array area. Key site information can be found in the JNCC RIS and Ramsar Sites Information Service.⁶³

33.1.3 Listed below are the qualifying species, specifying whether it was screened in for assessment or not.

- > Bittern (non-breeding), 3 individuals (1998-99 to 2002-03). Screened in for risk of collision on migration during O&M;
- > Gadwall (non-breeding), 261 individuals (1998-99 to 2002-03). Screened in for risk of collision on migration during O&M;
- > Teal (non-breeding), 3,083 individuals (1998-99 to 2002-03). Screened in for risk of collision on migration during O&M;
- > Shoveler (non-breeding), 238 individuals (1998-99 to 2002-03). Screened in for risk of collision on migration during O&M;
- > Avocet (non-breeding), 329 individuals (1998-99 to 2002-03). Screened in for risk of collision on migration during O&M;
- > Bearded tit (breeding), c.50 pairs (1990)⁶⁴. Not screened in (LSE can be discounted, risks for passerines are considered low and their routes of migration are not well-defined); and
- > Marsh Harrier (breeding), 16 pairs (1993-1997). Based on initial information, marsh harrier was screened in for risk of collision on migration during O&M in the screening report. However, Minsmere-Walberswick Ramsar lies directly to the west of the VE array. With migratory marsh harrier migrating to Southern Europe and sub-Saharan Africa (i.e. in a southerly direction) (Wright *et al.* 2012), it can be considered highly unlikely that migrating marsh harrier from this SPA have connectivity with the VE array located to the east, and as such, LSE can be discounted in relation to both alone and in-combination effects.

33.1.4 The Ramsar criteria for which the site is designated, along with qualifying species:.

- > Ramsar criterion 1: The site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh ditch plants from brackish to fresh water.

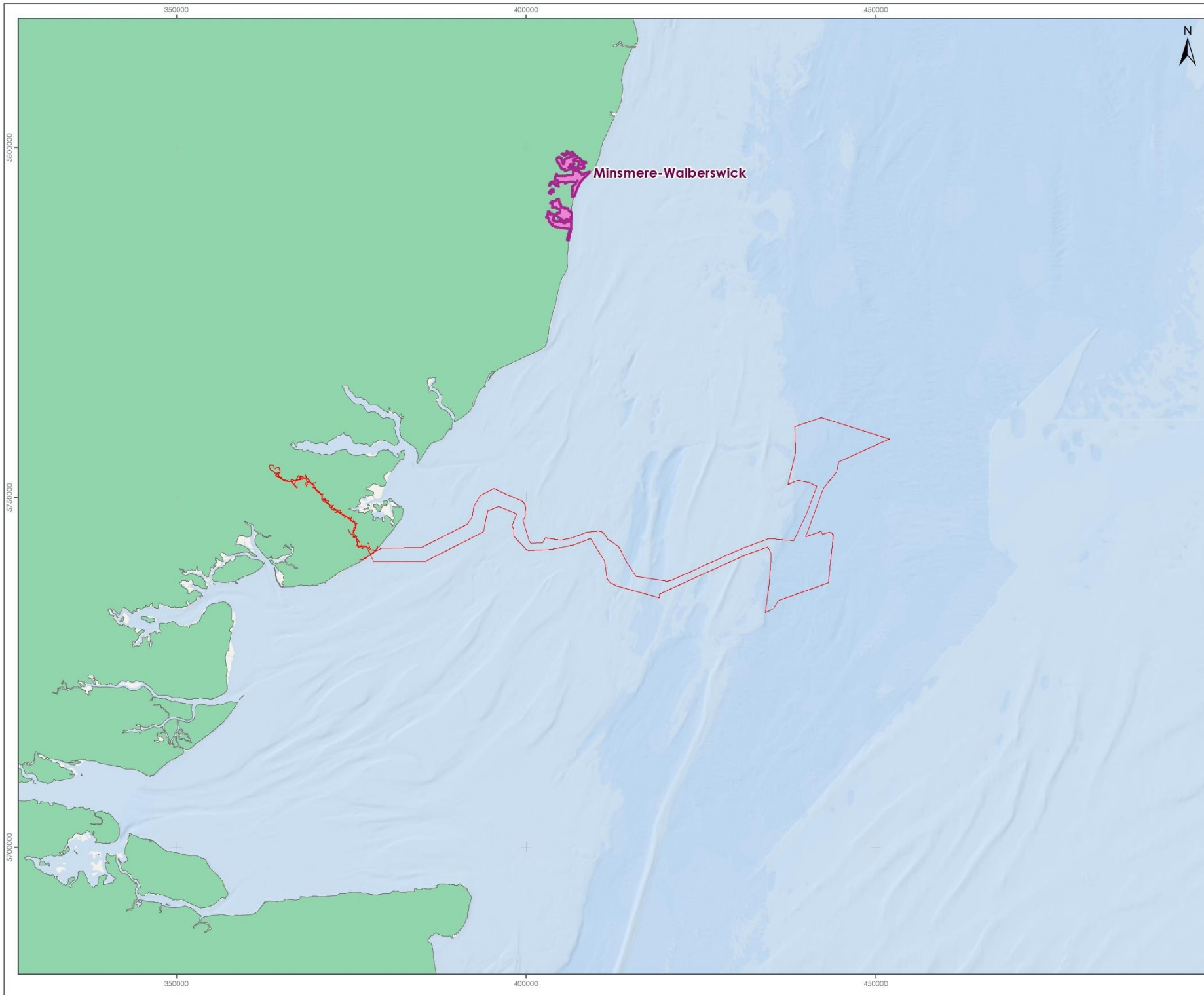
⁶³ JNCC RAMSAR Information Sheet and Ramsar Sites Information Service, accessible from <https://designatedsites.naturalengland.org.uk/>. (Accessed October 2022)

⁶⁴ Minssmere – Walberswick site information.

<https://rsis.ramsar.org/RISapp/files/RISrep/GB75RIS.pdf>. (Accessed October 2022).

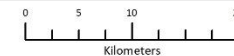
- > Ramsar criterion 2:
- > This site supports nine nationally scarce plants and at least 26 red data book invertebrates.
- > Supports a population of the mollusc *Vertigo angustior* (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth estuary river walls.
- > An important assemblage of rare breeding birds associated with marshland and reedbeds including:
 - > Bittern (non-breeding);
 - > Gadwall (non-breeding);
 - > Teal (non-breeding);
 - > Shoveler (non-breeding);
 - > Avocet (non-breeding);
 - > Bearded tit (breeding); and
 - > Marsh Harrier (breeding).

33.1.5 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.



LEGEND

- Order Limits
- Ramsar Site



Data Source:
Eti, Gornitz, GESCO, NOAA/NODC, and other contributors

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**Minsmere- Walberswick Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **33.1**

SCALE: 1:100,000	PLOT SIZE: A3	EXTENT: WGS84	PROJECTION: UTM31N
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34 MINSMERE-WALBERSWICK SPA

DISTANCE TO:

- > Array: 41.88 km
- > Offshore export cable corridor (ECC): 36.99 km.
- > Onshore ECC: 49.86 km

34.1.1 The Minsmere-Walberswick SPA is situated on the Suffolk coast. The area contains a variety of habitats, including grazing marsh (both coastal and freshwater), coastal reedbeds, saltmarsh, lowland heathland, woodland, intertidal mud and mixed sediment.

34.1.2 The SPA is 41.75 km from the VE array area. Site and citation information can be found in the Minsmere-Walberswick SPA Citation and Conservation Objectives⁶⁵, as well as the JNCC SPA data form⁶⁶.

34.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Bittern (breeding), 7 individuals (1993-1997). Screened in for risk of collision on migration during O&M;
- > Gadwall (breeding and non-breeding), 24 breeding pairs (1990) and 93 wintering individuals (1991-92, 1995-96). Screened in for risk of collision on migration during O&M;
- > Teal (breeding), 73 pairs (1990). Screened in for risk of collision on migration during O&M;
- > Shoveler (breeding and non-breeding), 23 breeding pairs (1990) and 98 wintering individuals (1991-92, 1995-96). Screened in for risk of collision on migration during O&M;
- > Hen harrier (non-breeding), 15 individuals (1985-86, 1989-90). Screened in for risk of collision on migration during O&M;
- > Avocet (breeding), 47 pairs (early 1990s). Screened in for risk of collision on migration during O&M;
- > White-fronted goose (non-breeding), 67 individuals (1991-92, 1995-96). Screened in for risk of collision on migration during O&M.
- > Nightjar (breeding), 24 pairs (1990). Based on initial information, nightjar was screened in for risk of collision on migration during O&M in the screening report. However, Minsmere-Walberswick SPA lies directly to the west of the VE array. Nightjar migrate south to winter in the Democratic Republic of Congo, and tracking data has shown that migrating individuals move in a clear southerly direction (Evens *et al.*, 2017). For that reason, it can be considered highly unlikely that migrating nightjar from this SPA have connectivity with the VE array located to the east, and as such, LSE can be discounted in relation to both alone and in-combination effects;
- > Marsh harrier (breeding), 16 pairs (1993-1997). Based on initial information, marsh harrier was screened in for risk of collision on migration during O&M in the screening report. However, Minsmere-Walberswick SPA lies directly

⁶⁵ European Site Conservation Objectives for Minsmere-Walberswick SPA (UK9009101). <http://publications.naturalengland.org.uk/publication/4528783260385280>. (Accessed October 2022).

⁶⁶ Minsmere-Walberswick SPA data form, accessible from <https://jncc.gov.uk/our-work/list-of-spas/> (Accessed October 2022).

to the west of the VE array. With migratory marsh harrier migrating to Southern Europe and sub-Saharan Africa (i.e. in a southerly direction) (Wright *et al.* 2012), it can be considered highly unlikely that migrating marsh harrier from this SPA have connectivity with the VE array located to the east, and as such, LSE can be discounted in relation to both alone and in-combination effects; and

- > Little tern (breeding), 28 pairs (1992-1996). Based on initial information, little tern was screened in for risk of collision on migration during O&M in the screening report. However, evidence shows that little tern are a strictly coastal, rather than marine species; they are the most inshore of all tern species, are found in shallow waters on passage, foraging no further than 15km offshore (BirdLife International, 2022). WWT & MacArthur Green (2014) found that little tern migrate within 10km of the shoreline. The species can therefore be considered highly unlikely to have connectivity with the VE array area on migration, and as such, LSE can be discounted in relation to both alone and in-combination effects.

34.1.4 The Conservation Objectives⁶⁵ for the site are:

“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

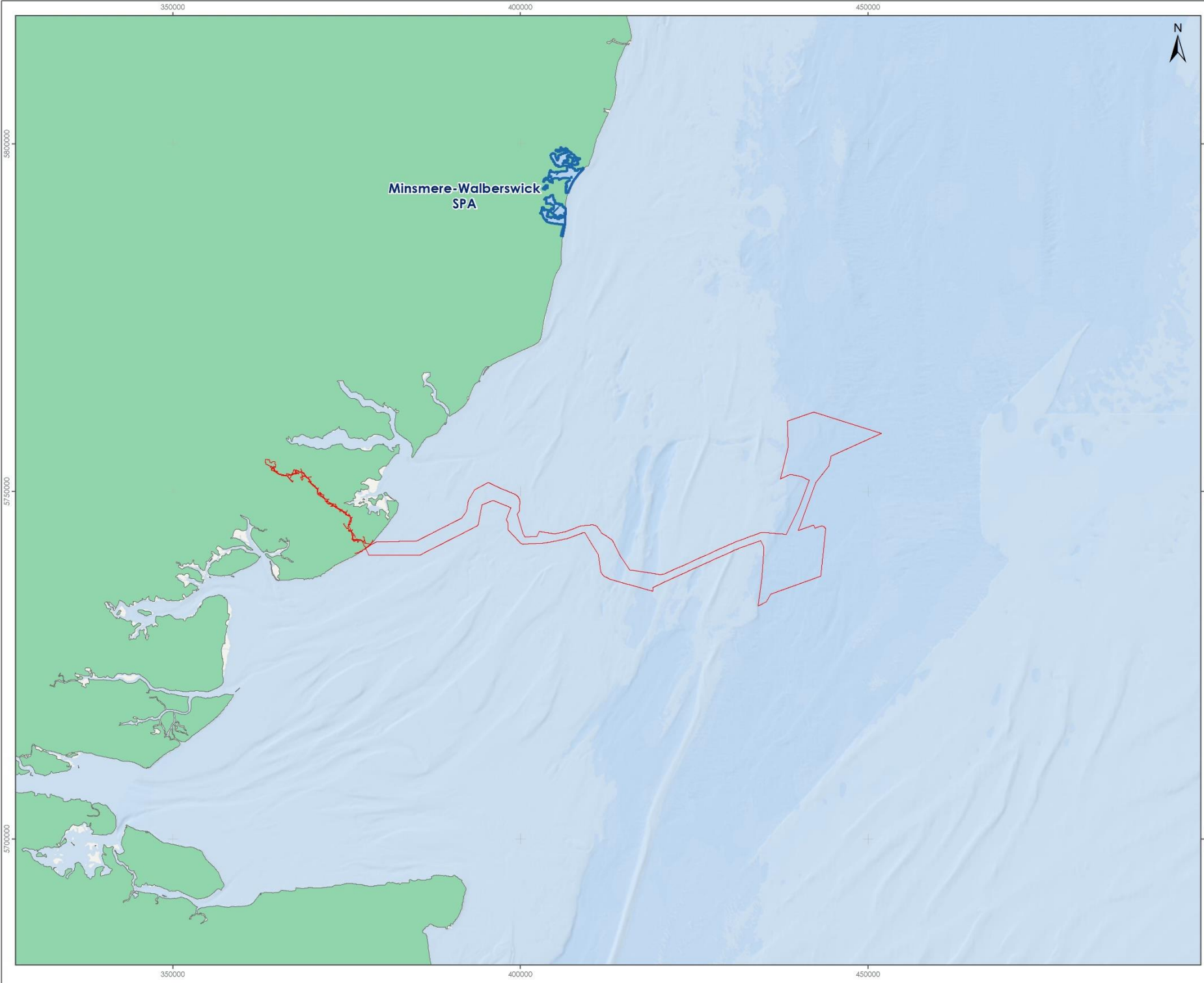
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

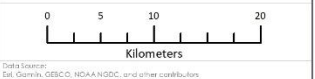
The population of each of the qualifying features, and,

The distribution of the qualifying features within the site”.



LEGEND

- Order Limits
- Special Protection Area



Data Sources:
Eri, Garmin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Minsmere - Walberswick SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 34.1

SCALE: 1:500,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



35 NOORDZEEKUSTZONE SCI

DISTANCE TO:

- > Array: 169 km
- > Offshore export cable corridor (ECC): 177 km.
- > Onshore ECC: 243 km

35.1.1 The sandy coastal area along the North Sea consists of coastal waters, shallows, a few sandbanks (including Noorderhaaks) and the beaches of northern North Holland and the Wadden Islands. Sandbanks that are permanently flooded with seawater occur in particular in the outer deltas of the channels between the Wadden Islands. The receptor group 'marine mammals' is relevant to the Noordzeekustzone SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Noordzeekustzone SCI site information (in Dutch)⁶⁷.

35.1.2 The site is designated for the following Annex I habitats:

- > Sandbanks which are slightly covered by sea water all the time;
- > Mudflats and sandflats not covered by seawater at low tide;
- > *Salicornia* and other annuals colonising mud and sand;
- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- > Embryonic shifting dunes; and
- > Humid dune slacks.

35.1.3 The following Annex II species:

- > Sea lamprey (*Petromyzon marinus*);
- > River lamprey (*Lampetra fluviatilis*);
- > Fen orchid (*Liparis loeselii*);
- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

35.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:

- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and

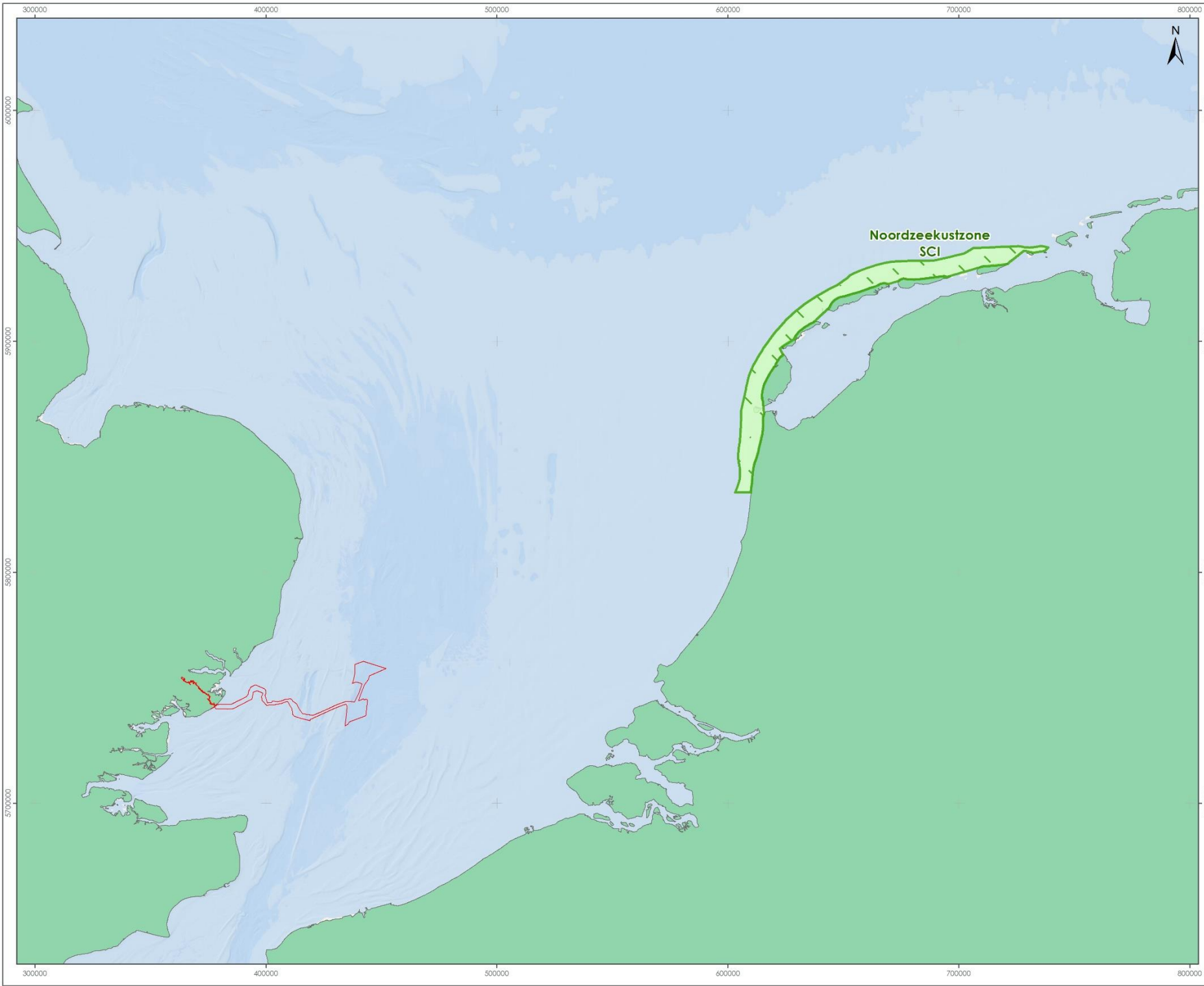
⁶⁷ <https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=1&id=n2k7>

- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

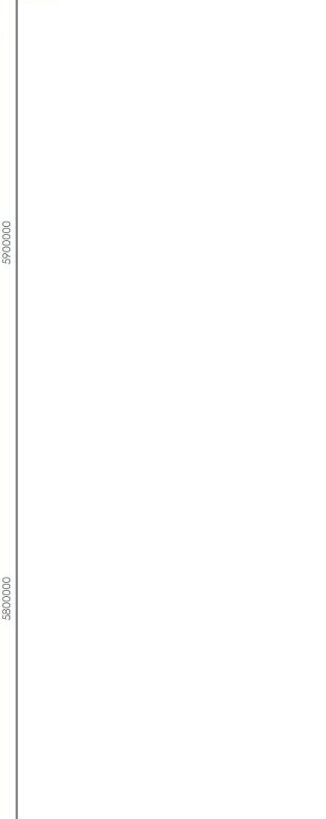
35.1.5 Additional information for the Noordzeekustzone SCI can be found on the Ministry of Agriculture, Nature and Food Quality website⁶⁸, and includes national conservation status and conservation targets for the site features. For grey seal the national conservation status is identified as 'moderately favourable'. The targets applicable to grey seal are listed below:

- > Conserve the area and quality of supporting habitat;
- > Conserve the population size;
- > Improving the quality of habitat for marine mammals;
- > Conservation of intertidal habitat for grey seal; and
- > Maintain undisturbed resting places and optimal breeding habitat for grey seal

⁶⁸<https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=1&id=n2k7&opic=doelstelling>



- LEGEND**
- Order Limits
 - Site of Community Importance



PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Noordzeekustzone SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPB	WH

DRAWING NUMBER: 35.1

SCALE: 1:1,000,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N

FIVE ESTUARIES
OFFSHORE WIND FARM

36 VOORDELTA SCI

DISTANCE TO:

- > Array: 78.57km
- > Offshore export cable corridor (ECC): 80.8km.
- > Onshore ECC: 142.8km

36.1.1 The Voordelta includes the shallow sea portion of the Zeeland and South Holland Delta. The area is characterized by the presence of a varied and dynamic environment of coastal waters, intertidal zone and beaches, which forms a relatively sheltered transition zone between the (former) estuaries and the sea. After the closing of the Delta Works, this coastal area has been subject to major changes, resulting in an extensive system of tidal and deeper sandbanks with deeper channels in between. Due to erosion and sedimentation processes, shifts occur in the size of intertidal areas. The water quality is influenced in particular by the outflow of the Rhine and Maas through the Haringvliet locks. Partly due to this supply of nutrients, the Voordelta has a high food richness. There are a number of salt marshes and more intertidal areas in the edges of the area near Voorne and Goeree, with beaches and sand dunes among the Zeeland and South Holland islands. The receptor group 'marine mammals' is relevant to the Voordelta SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Voordelta SCI site information (in Dutch)⁶⁹.

36.1.2 The site is designated for the following Annex I habitats:

- > Sandbanks which are slightly covered by sea water all the time;
- > Mudflats and sandflats not covered by seawater at low tide;
- > *Salicornia* and other annuals colonising mud and sand;
- > *Spartina* swards (*Spartinion maritimae*);
- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- > Embryonic shifting dunes; and
- > Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes').

36.1.3 The following Annex II species:

- > Sea lamprey (*Petromyzon marinus*);
- > River lamprey (*Lampetra fluviatilis*);
- > Allis shad (*Alosa alosa*);
- > Twaite shad (*Alosa fallax*);
- > Harbour porpoise (*Phocoena phocoena*);

- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

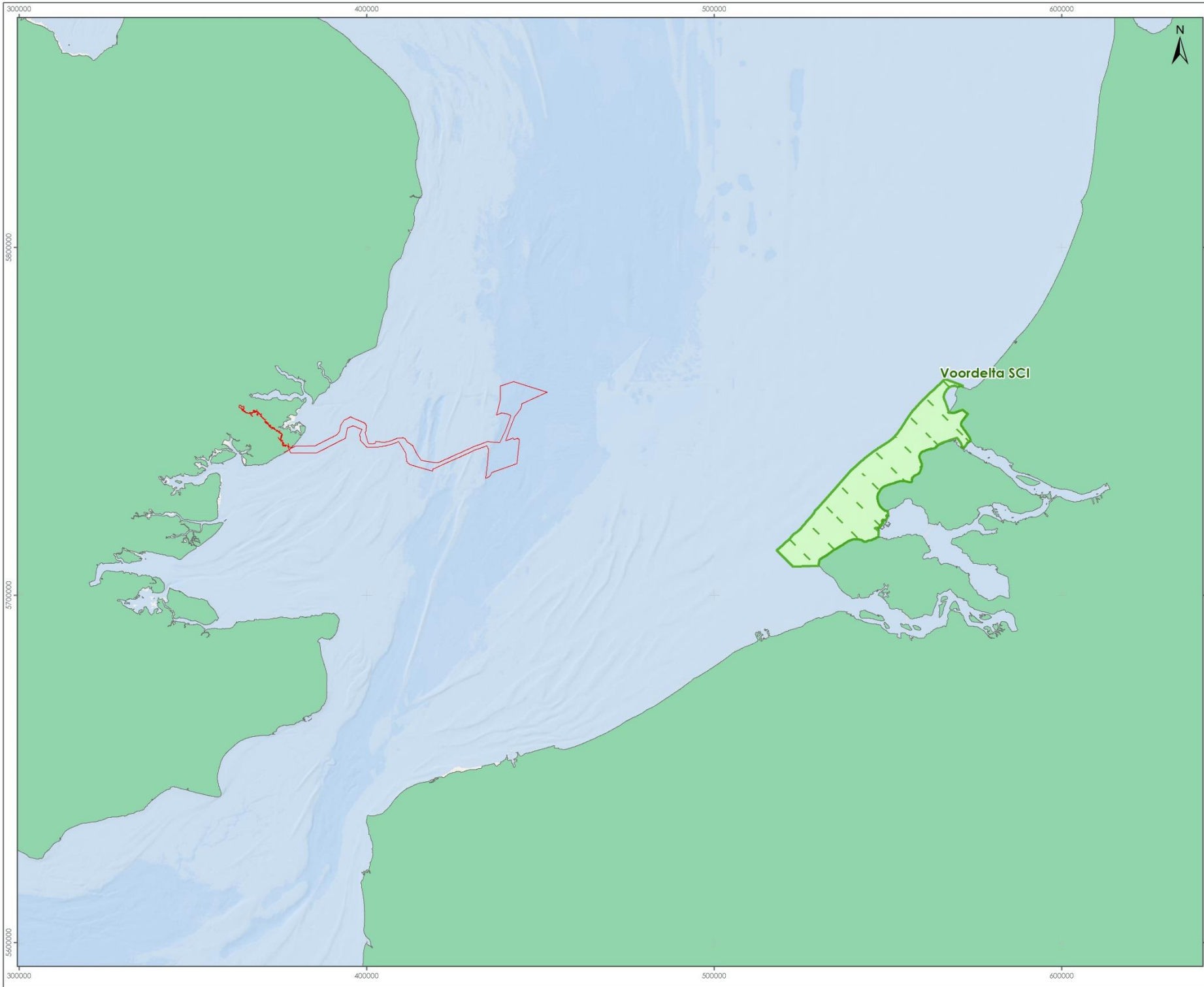
36.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:

- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

36.1.5 Additional information for the Voordelta SCI can be found on the Ministry of Agriculture, Nature and Food Quality website⁷⁰, and includes national conservation status and conservation targets for the site features. For grey seals national conservation status is identified as 'moderately favourable'. The targets applicable to grey seal are listed below:

- > Conserve the area and quality of supporting habitat;
- > Conserve the population size; and
- > Conservation of intertidal areas for resting grey seal

⁷⁰<https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=9&id=n2k113&topic=doelstelling>



LEGEND

- Order Limits
- Site of Community Importance



Data Source:
BfN, Garmin, GEBCO, NOAA-NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Voordelta SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHS	WH

DRAWING NUMBER: **36.1**

SCALE: 1:1,000,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N



37 VLAKE VAN DE RAAN SCI

DISTANCE TO:

- > Array: 79 km
- > Offshore export cable corridor (ECC): 82 km.
- > Onshore ECC: 141 km

37.1.1 The Vlake van der Raan SCI is located in Belgian waters and extends for some 17,500 ha⁷¹. The receptor group 'marine mammals' is relevant to the Vlake van der Raan SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Vlake van der Raan SCI site information⁷².

37.1.2 The site is designated for the following Annex I habitat:

- > Sandbanks which are slightly covered by sea water all the time.

37.1.3 The following Annex II species:

- > Twaite shad (*Alosa fallax*);
- > Sea lamprey (*Petromyzon marinus*);
- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

37.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:

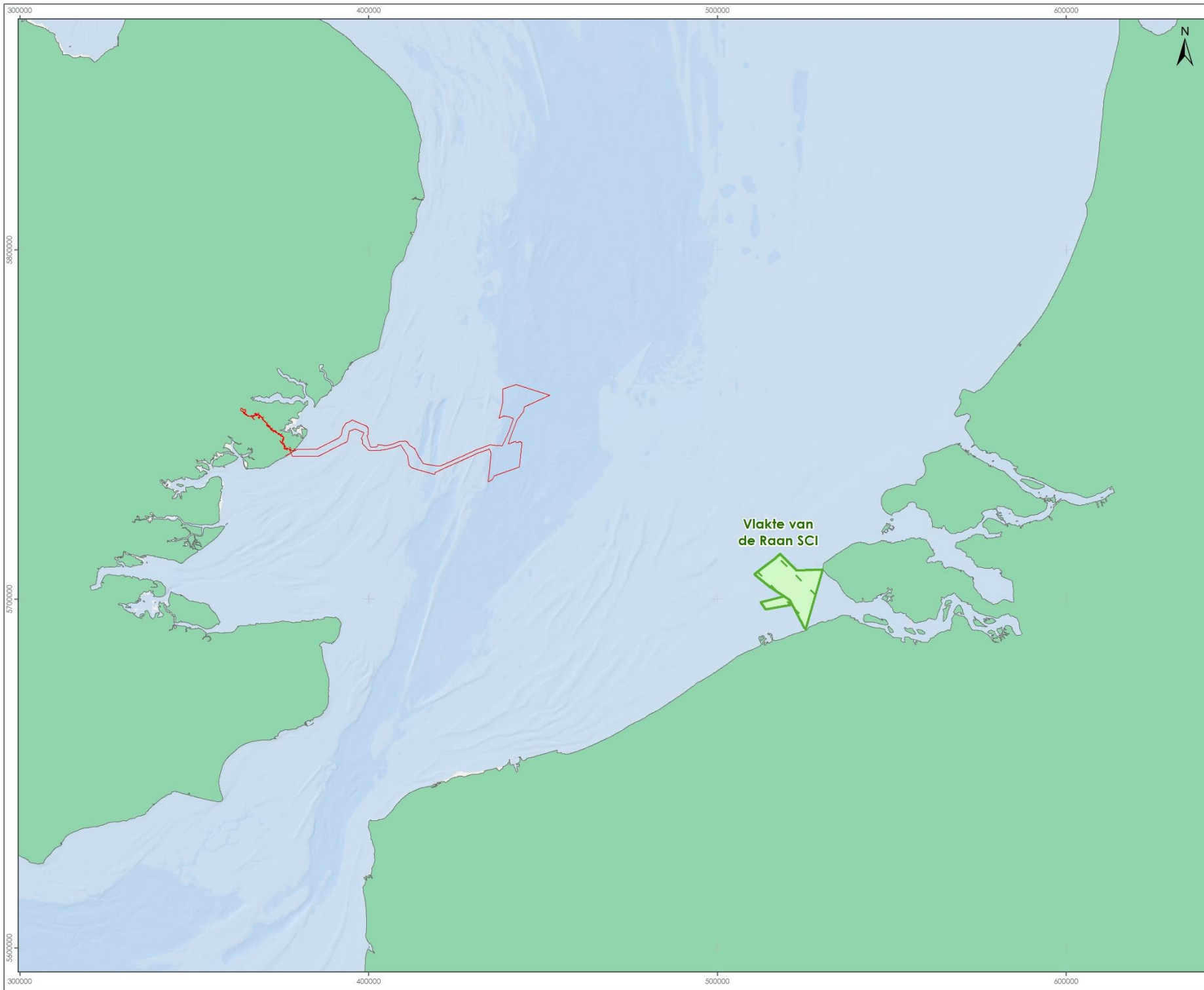
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

⁷¹ https://www.rwsnatura2000.nl/Gebieden/VvdR_Vlake+van+de+Raan/default.aspx

⁷² https://www.rwsnatura2000.nl/Gebieden/VvdR_Vlake+van+de+Raan/337009.aspx?t=Vlake+van+de+Raan

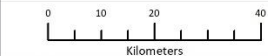
37.1.5 Additional information for the Vlake van der Raan SCI can be found in the Natura 2000 data form⁷³; no information on conservation status or conservation targets for the site features have been sourced. Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

⁷³ <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BEMNZ0005>



LEGEND

- Order Limits
- Site of Community Importance



Data Sources:
Eel, Garmin, OESCO, NOAA NODC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Vlakte Van De Raan SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **37.1**

SCALE: 1:1,000,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM31N



38 WESTERSCHELDE & SAEFTINGHE SCI

DISTANCE TO:

- > Array: 92 km
- > Offshore export cable corridor (ECC): 94 km.
- > Onshore ECC: 156 km

38.1.1 The Westerschelde & Saeftinghe SCI is located in Dutch waters and extends for some 44,052 ha⁷⁴. The receptor group 'marine mammals' is relevant to the Westerschelde & Saeftinghe SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Westerschelde & Saeftinghe SCI site information⁷⁵.

38.1.2 The site is designated for the following Annex I habitats:

- > Sandbanks which are slightly covered by sea water all the time;
- > Estuaries;
- > Mudflats and sandflats not covered by seawater at low tide;
- > *Salicornia* and other annuals colonising mud and sand;
- > *Spartina* swards (*Spartinion maritimae*);
- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- > Embryonic shifting dunes;
- > Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes);
- > Fixed coastal dunes with herbaceous vegetation (grey dunes);
- > Dunes with *Hippophae rhamnoides*; and
- > Humid dune slacks.

38.1.3 The following Annex II species:

- > Twaite shad (*Alosa fallax*);
- > River lamprey (*Lampetra fluviatilis*);
- > Sea lamprey (*Petromyzon marinus*);
- > Fen orchid (*Liparis loeselii*);
- > Narrow-mouthed whorl snail (*Vertigo angustior*);
- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

38.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:

- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);

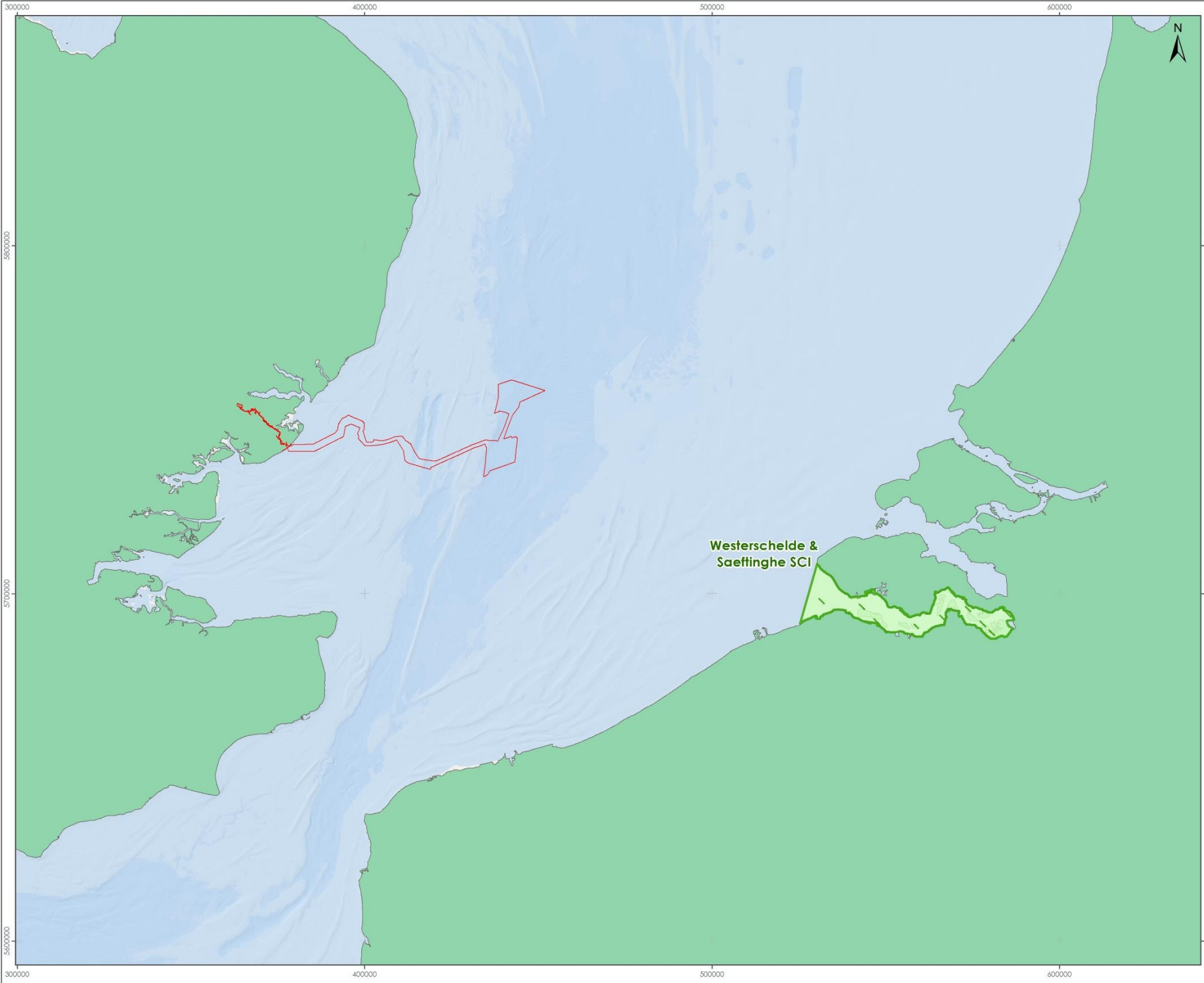
⁷⁴ <http://eunis.eea.europa.eu/sites/NL9803061>

⁷⁵ <http://eunis.eea.europa.eu/sites/NL9803061>

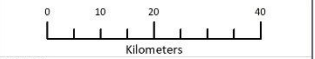
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

38.1.5 Additional information for the Westerschelde & Saeftinghe SCI can be found in the Natura 2000 data form⁷⁶; no information on conservation status or conservation targets for the site features have been sourced. Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

⁷⁶ <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL9803061>



- LEGEND**
- Order Limits
 - Site of Community Importance



Data Sources:
Eel, Garmin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Westerschelde and Saeflinghe SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 38.1

SCALE: 1:1,000,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



39 THE WASH AND NORTH NORFOLK COAST SAC

DISTANCE TO:

- > Array: 126.45 km
- > Offshore export cable corridor (ECC): 119.42 km.
- > Onshore ECC: 105.40 km

39.1.1 Situated on the East Coast of England, The Wash and North Norfolk SAC covers some 1077.6 km² and encompasses the largest embayment in the UK⁷⁷. Based on screening for potential LSE, the receptor group 'marine mammals' is relevant to The Wash and North Norfolk Coast SAC.

39.1.2 Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline;
- > Natural England Conservation Advice for Marine Protected Areas: The Wash and North Norfolk Coast SAC (dated March 2019)⁷⁸;
- > Natural England The Wash and North Norfolk SAC Advice on Operations⁷⁹ (dated March 2019);
- > The Wash and North Norfolk Coast SAC Citation⁸⁰; and
- > JNCC Natura 2000 Standard Data Form⁸¹ (dated 25 January 2016).

39.1.3 The site is designated for the following Annex I habitats:

- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- > Coastal lagoons;
- > Large shallow inlets and bays;
- > Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*);
- > Mudflats and sandflats not covered by seawater at low tide;
- > Reefs;
- > Salicornia and other annuals colonising mud and sand; and
- > Sandbanks which are slightly covered by sea water all the time.

39.1.4 Together with the following Annex II species:

- > Harbour (common) seal (*Phoca vitulina*); and
- > Otter (*Lutra lutra*).

⁷⁷<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and&countyCode=&responsiblePerson=&SeaArea=&IFCAAArea=>

⁷⁸

<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0017075&SiteName=>

⁷⁹<https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAAArea=>

⁸⁰ <http://publications.naturalengland.org.uk/file/5068730392379392>

⁸¹ <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0017075.pdf>

- 39.1.5 For the feature screened in for potential LSE (harbour seal), the recent condition assessment does not provide an assessment⁸².
- 39.1.6 Subtidal sandbanks and reefs are widespread throughout The Wash and North Norfolk Coast SAC. Commercially important fish species use sandbanks as nursery grounds and reefs are associated with elevated biodiversity and species abundance. The site has an outstanding example of the habitat *Sabellaria spinulosa* reef, large areas of intertidal sand and mudflats, often colonised by *Salicornia* sp. and saltmarsh communities. Coastal lagoons on the North Norfolk coast are maintained by the barrier beach system and inland coastal lagoons provide habitat for unique invertebrate communities. The site is also important for common seals (*Phoca vitulina*), providing key habitat for breeding and hauling-out.
- 39.1.7 The Wash is over 64,000 ha and represents the large shallow inlet and bay feature on the English East Coast. This is a complex feature, which encompasses a number of other features, of which some have subfeatures associated with them, specifically the features 'mudflats and sandflats not covered by seawater at low tide', 'sandbanks which are slightly covered by sea water all the time' and 'reefs'. No sub features are listed for the features 'Atlantic salt meadows (*Glaucopuccinellietalia maritima*)', 'coastal lagoons', 'Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)' and 'Salicornia and other annuals colonising mud and sand'.
- 39.1.8 Of the site features, potential LSE has been identified for Harbour (common) seal (*Phoca vitulina*) only with respect to Hornsea Four under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and
 - > Disturbance at haul out (construction, operations and maintenance and decommissioning).
- 39.1.9 Natural England carried out a feature condition assessment of some (but not all) site features and the results reported in January 2019 are presented in Table 1.

⁸²<https://designatedsites.naturalengland.org.uk/Marine/MarineFeatureCondition.aspx?SiteCode=UK0017075&SiteName=&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

Table 1: The Wash and North Norfolk Coast SAC Feature Condition Assessment .

Feature	Date Assessed	Favourable	Unfavourable recovering	Unfavourable No Change	Unfavourable Declining	Destroyed	Not assessed
> H1110 Sandbanks which are slightly covered by sea water all the time	> 26/01/2019	> 72%	> 28%	>	>	>	>
> H1140 Mudflats and sandflats not covered by seawater at low tide	> 26/01/2019	>	>	> 99%	> 1%	>	>
> H1170 Reefs	> 26/01/2019	> 1%	> 37%	> 61%	>	>	> 1%
> H1160 Large shallow inlets and bays	> 26/01/2019	> 39%	>	> 60%	>	>	> 1%

39.1.10 Advice on operations was last updated in March 2020, including advice for offshore wind and cables (during construction, operations and maintenance and decommissioning)⁸³. Management measures were issued in September 2017⁸⁴, with these limited to commercial fishing activities.

39.1.11 The Site Improvement Plan for The Wash and North Norfolk Coast SAC was issued in December 2014, as part of The Wash and North Norfolk Coast EMS⁸⁵. Reference to the harbour seal feature of the SAC is in relation to public access/disturbance.

⁸³<https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0017075&SiteName=&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

⁸⁴<https://designatedsites.naturalengland.org.uk/SiteMMO.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

⁸⁵

<http://publications.naturalengland.org.uk/publication/5327498292232192?category=487302356375961>

39.1.12 The Supplementary Advice for The Wash and North Norfolk Coast SAC was updated in March 2020⁸⁶. The only feature screened in for potential LSE for the site is harbour seal (*Phoca vitulina*). The targets applicable to this feature are listed below:

- > Maintain the population size within the site;
- > Maintain the reproductive and recruitment capability of the species;
- > Maintain the presence and spatial distribution of the species and their ability to undertake key life cycle stages and behaviours;
- > Maintain connectivity of the habitat within sites and the wider environment to allow movement of migratory species;
- > Restrict the introduction and spread of non-native species and pathogens, and their impacts;
- > Maintain the extent and spatial distribution of the following supporting habitats: foraging and haul out sites;
- > Maintain the abundance of preferred food items required by the species;
- > Maintain the natural physico-chemical properties of the water;
- > Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement is not significantly altered or constrained;
- > Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels;
- > Maintain water quality to mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features avoiding deterioration from existing levels; and
- > Maintain natural levels of turbidity (e.g. suspended concentrations of sediment, plankton and other material) in areas where this species is or could be present.

39.1.13 The Conservation Objectives for The Wash and North Norfolk Coast SAC⁸⁷ are as follows:

“The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

the extent and distribution of qualifying natural habitats and habitats of the qualifying species;

the structure and function (including typical species) of qualifying natural habitats;

the structure and function of the habitats of the qualifying species;

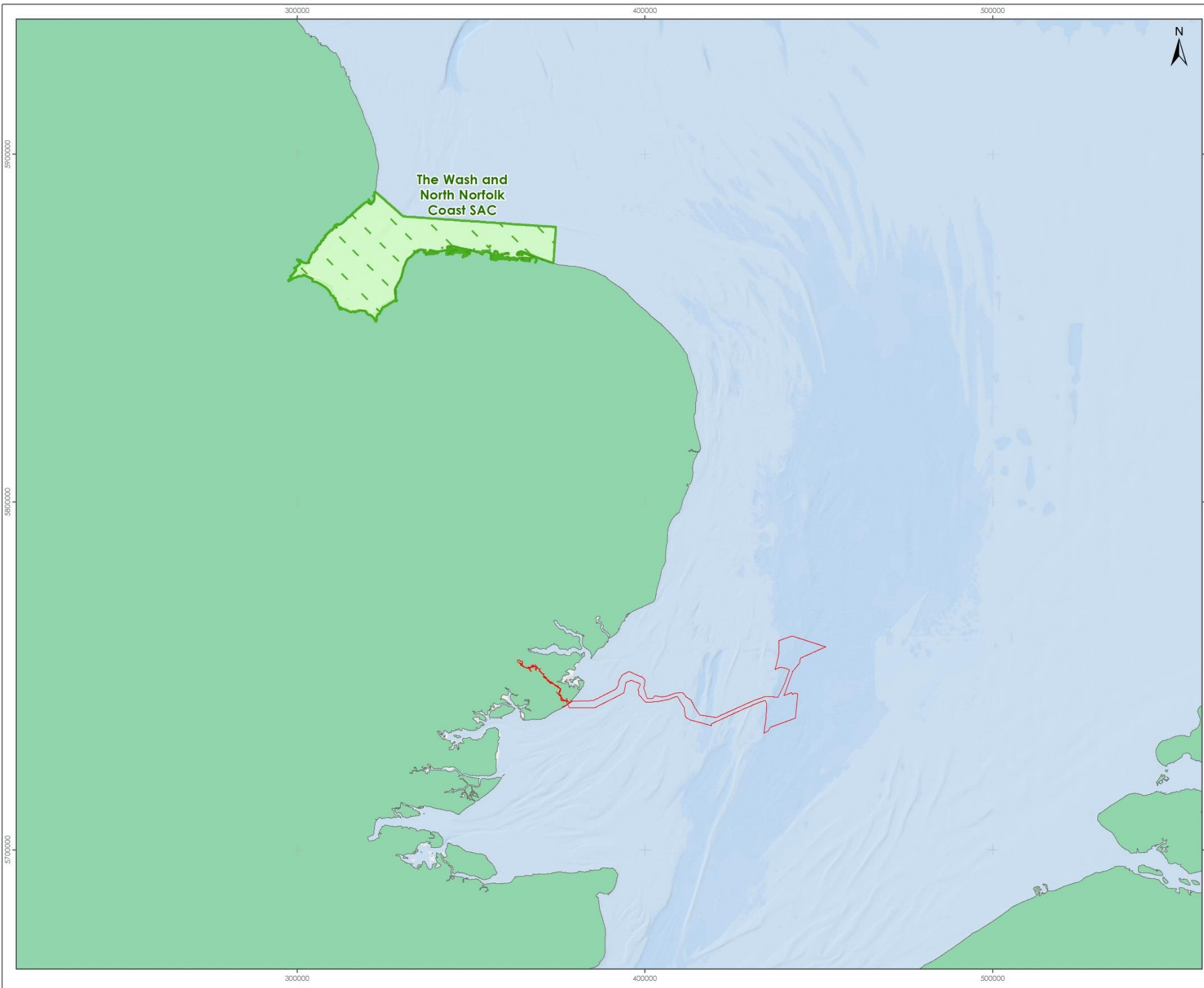
⁸⁶<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

⁸⁷<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0017075&SiteName=the%20wash%20and&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=#hlco>

the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;

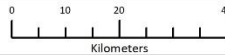
the populations of each of the qualifying species; and

the distribution of qualifying species within the site.”



LEGEND

- Order Limits
- Special Area of Conservation



Data Source:
Ordnance Survey, GEBCO, NGA, NOAA, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**The Wash and North Norfolk Coast SAC
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	8PHB	WH

DRAWING NUMBER: **39.1**

SCALE: 1:1,000,000 | POST: 2023 | A3 | DATUM: WGS84 | PROJECTION: UTM31N



40 SBZ 1 SCI

DISTANCE TO:

- > Array: 68 km
- > Offshore export cable corridor (ECC): 75 km.
- > Onshore ECC: 112 km

40.1.1 The SBZ 1 SCI is located in Belgian waters and extends for some 6,315.6 ha⁸⁸. The receptor group 'marine mammals' is relevant to the SBZ 1 SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > SBZ 1 SCI site information⁸⁹.

40.1.2 The site is designated for the following Annex I habitat:

- > Sandbanks which are slightly covered by sea water all the time;
- > Reefs.

40.1.3 The following Annex II species:

- > Twaite shad (*Alosa fallax*);
- > River lamprey (*Lampetra fluviatilis*);
- > Sea lamprey (*Petromyzon marinus*);
- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

40.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:

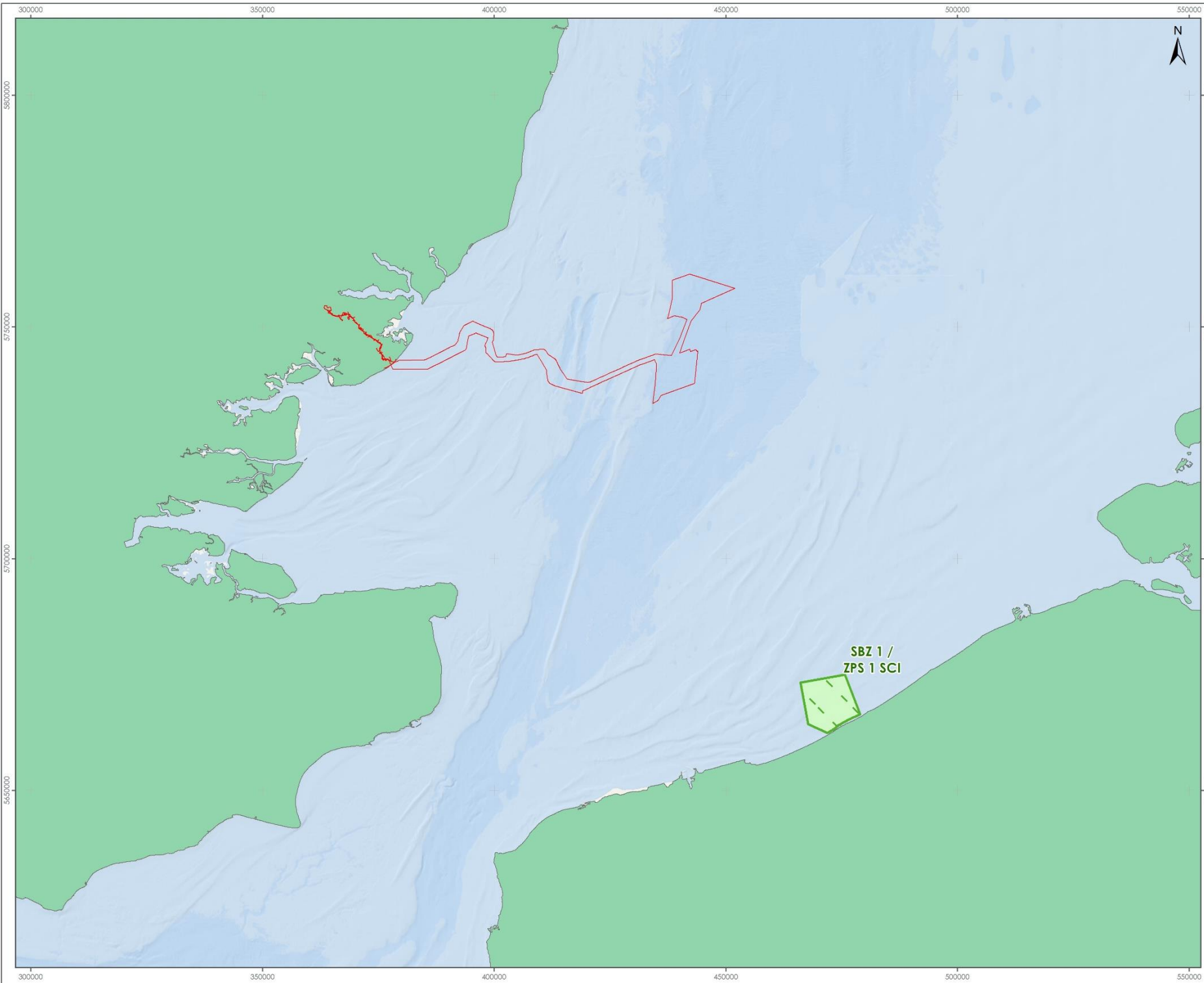
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

⁸⁸ <http://eunis.eea.europa.eu/sites/BEMNZ0002>

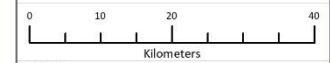
⁸⁹ <http://eunis.eea.europa.eu/sites/BEMNZ0002>

40.1.5 Additional information for the SBZ 1 SCI can be found in the Natura 2000 data form⁹⁰; no information on conservation status or conservation targets for the site features have been sourced. Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

⁹⁰ <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BEMNZ0002>



- LEGEND**
- Order Limits
 - Site of Community Importance



Data Source:
Eel, Garmin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
SBZ 1 SCI
in relation to Five Estuaries

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 40.1

SCALE: 1:250,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



41 SBZ 2 SCI

DISTANCE TO:

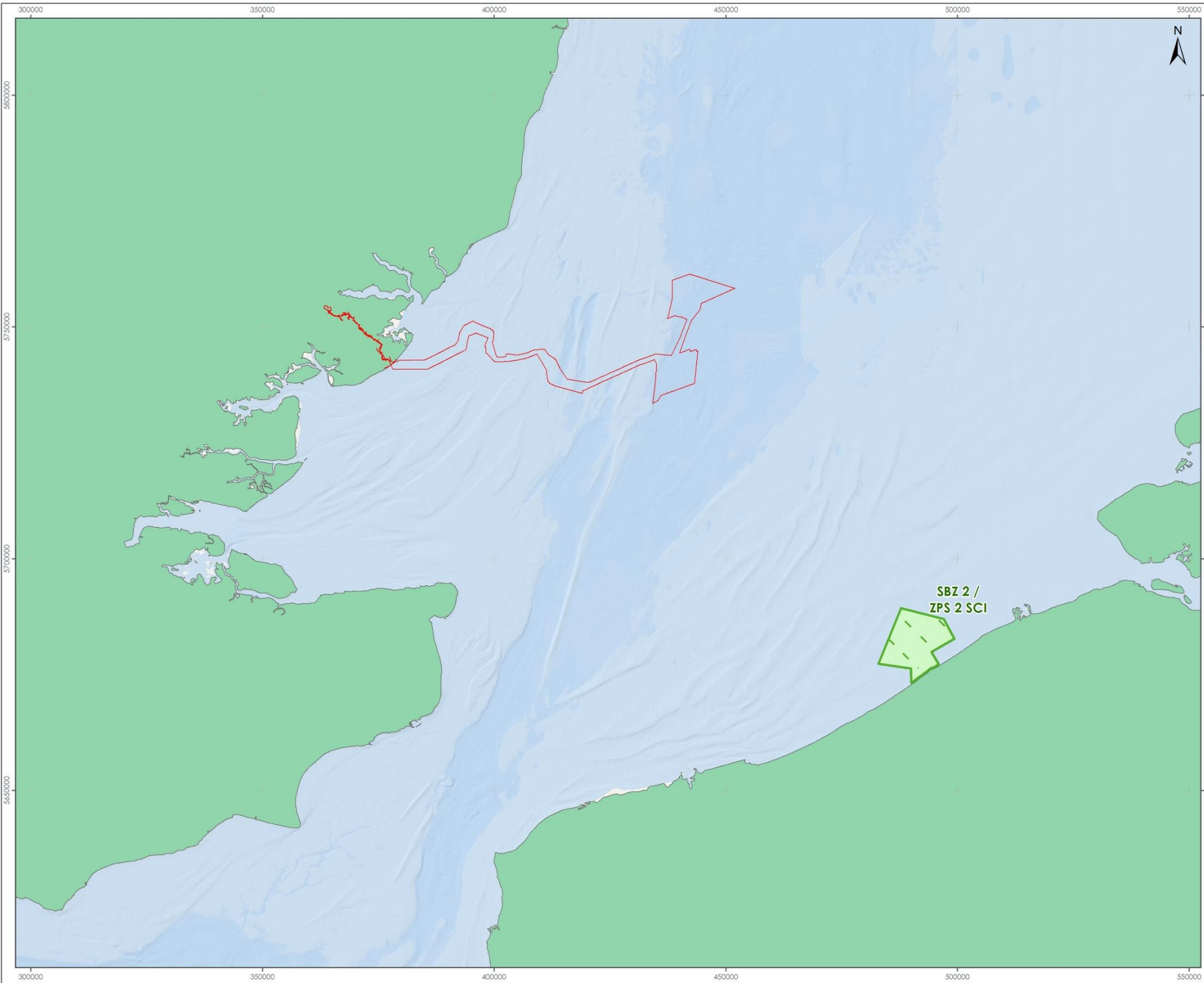
- > Array: 66 km
 - > Offshore export cable corridor (ECC): 71 km.
 - > Onshore ECC: 121 km
- 41.1.1 The SBZ 2 SCI is located in Belgian waters and extends for some 8,139.7 ha⁹¹. The receptor group 'marine mammals' is relevant to the SBZ 2 SCI. Key literature sources, including relevant project literature, are as follows:
- > Volume 2, Chapter 7: Marine Mammals;
 - > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
 - > SBZ 2 SCI site information⁹².
- 41.1.2 The site is designated for the following Annex I habitat:
- > Sandbanks which are slightly covered by sea water all the time;
 - > Reefs.
- 41.1.3 The following Annex II species:
- > Twaite shad (*Alosa fallax*);
 - > River lamprey (*Lampetra fluviatilis*);
 - > Sea lamprey (*Petromyzon marinus*);
 - > Harbour porpoise (*Phocoena phocoena*);
 - > Harbour (common) seal (*Phoca vitulina*); and
 - > Grey seal (*Halichoerus grypus*).
- 41.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and
 - > Disturbance at haul out (construction, operations and maintenance and decommissioning).

⁹¹ <http://eunis.eea.europa.eu/sites/BEMNZ0003>

⁹² <http://eunis.eea.europa.eu/sites/BEMNZ0003>

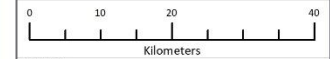
41.1.5 Additional information for the SBZ 2 SCI can be found in the Natura 2000 data form⁹³; no information on conservation status or conservation targets for the site features have been sourced. Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

⁹³ <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BEMNZ0003>



LEGEND

- Order Limits
- Site of Community Importance



Data Source:
Est. Garmin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

**SBZ 2 SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **41.1**

SCALE: 1:250,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N

**FIVE
ESTUARIES**
OFFSHORE WIND FARM

42 SBZ 3 SCI

DISTANCE TO:

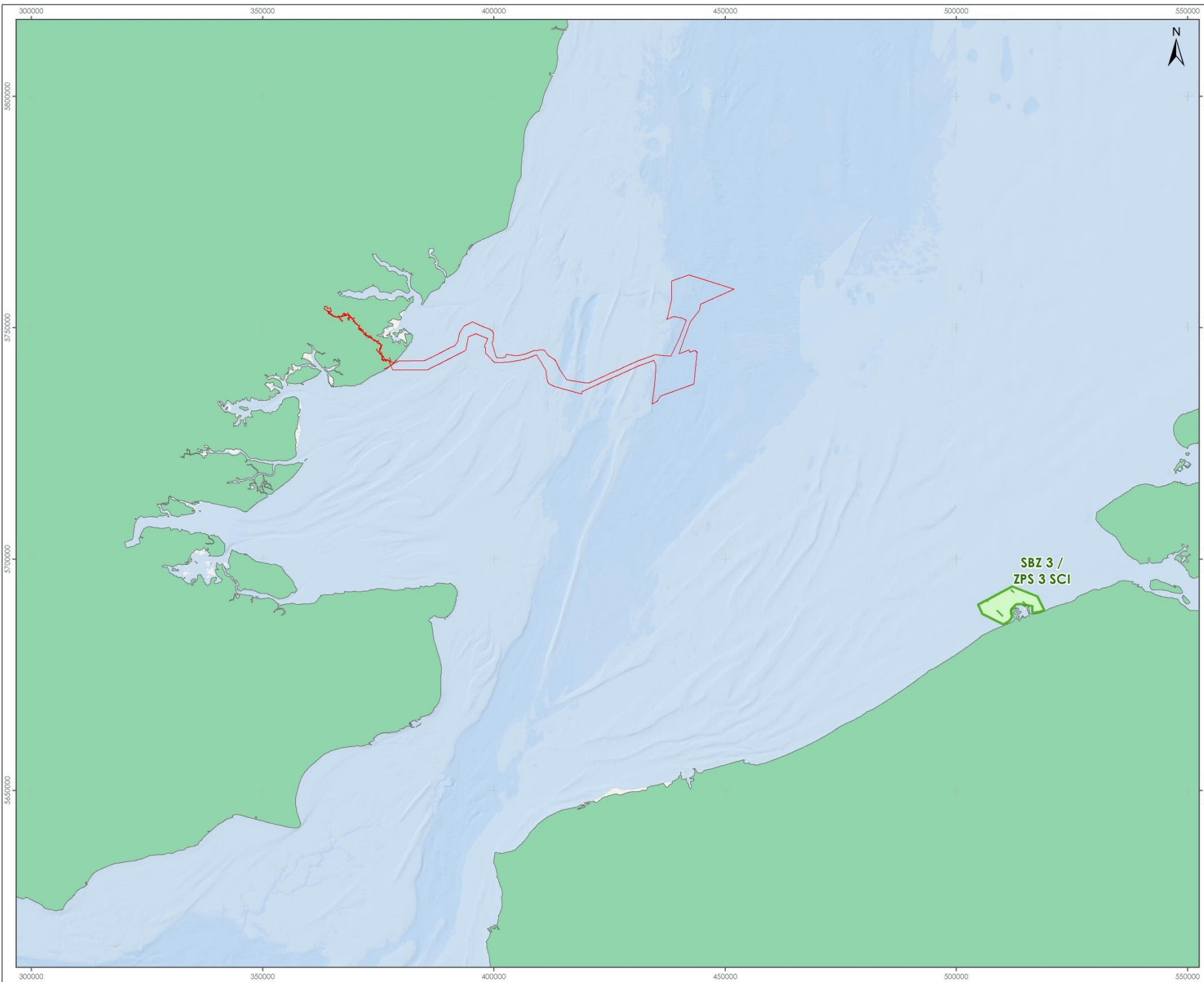
- > Array: 78 km
 - > Offshore export cable corridor (ECC): 82 km.
 - > Onshore ECC: 137 km
- 42.1.1 The SBZ 3 SCI is located in Belgian waters and extends for some 5,675.6 ha⁹⁴. The receptor group 'marine mammals' is relevant to the SBZ 3 SCI. Key literature sources, including relevant project literature, are as follows:
- > Volume 2, Chapter 7: Marine Mammals;
 - > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
 - > SBZ 3 SCI site information⁹⁵.
- 42.1.2 The site is designated for the following Annex I habitat:
- > Sandbanks which are slightly covered by sea water all the time; and
 - > Reefs.
- 42.1.3 Together with the following Annex II species:
- > Twaite shad (*Alosa fallax*);
 - > River lamprey (*Lampetra fluviatilis*);
 - > Sea lamprey (*Petromyzon marinus*);
 - > Harbour porpoise (*Phocoena phocoena*);
 - > Harbour (common) seal (*Phoca vitulina*); and
 - > Grey seal (*Halichoerus grypus*).
- 42.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:
- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
 - > Habitat loss (construction and decommissioning);
 - > Collision risk (construction, operations and maintenance and decommissioning);
 - > Changes to prey (construction, operations and maintenance and decommissioning); and
 - > Disturbance at haul out (construction, operations and maintenance and decommissioning).

⁹⁴ <http://eunis.eea.europa.eu/sites/BEMNZ0004>

⁹⁵ <http://eunis.eea.europa.eu/sites/BEMNZ0004>

42.1.5 Additional information for the SBZ 3 SCI can be found in the Natura 2000 data form⁹⁶; no information on conservation status or conservation targets for the site features have been sourced. Therefore, as a proxy and to ensure consistency across the RIAA, the conservation objectives applied elsewhere for transboundary assessments for grey seal have been applied here. The focus of these is on conserving the habitat and population.

⁹⁶ <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BEMNZ0004>



- LEGEND**
- Order Limits
 - Site of Community Importance



Data Sources:
Est. Gormin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**SBZ 3 SCI
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **42.1**

SCALE: 1:100000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



43 STOUR AND ORWELL ESTUARIES SPA

DISTANCE TO:

- > Array: 54.81 km
- > Offshore export cable corridor (ECC): 12.75 km.
- > Onshore ECC: 3.15 km

43.1.1 The Stour and Orwell estuaries straddle the eastern part of the Essex/Suffolk border in eastern England. The estuaries include extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The mud-flats hold *Enteromorpha*, *Zostera* and *Salicornia* spp. The site also includes areas of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell and at Cattawade Marshes at the head of the Stour. Trimley Marshes on the north side of the Orwell includes several shallow freshwater pools, as well as areas of grazing marsh, and is managed as a nature reserve by the Suffolk Wildlife Trust. In summer, the site supports important numbers of breeding avocet *Recurvirostra avosetta*, while in winter it holds major concentrations of waterbirds, especially geese, ducks and waders. The geese also feed, and some waders roost, in surrounding areas of agricultural land outside the SPA. The site has close ecological links with the Hamford Water and Mid-Essex Coast SPAs, lying to the south on the same coast.

43.1.2 The SPA is 55 km from the VE array area. Site and citation information can be found in the Greater Wash SPA Citation and Conservation Objectives.⁹⁷

43.1.3 Listed below are the qualifying features of the site, showing whether they are breeding or non-breeding features and the citation population. For each feature, it is specified whether it was screened in for assessment.

- > Over winter:
 - > Black-tailed godwit
 - > Dark-bellied brent goose
 - > Dunlin
 - > Grey plover
 - > Knot
 - > Pintail
 - > Redshank
 - > Waterbird assemblage
- > On passage:
 - > Redshank
- > During the breeding season:

⁹⁷ <https://publications.naturalengland.org.uk/publication/6069687402102784>

> Avocet

43.1.4 Each of the above species is screened in for the following:

- > Loss of foraging and roosting habitat outside the SPA (construction);
- > Disturbance of birds outside the SPA (construction, operation and maintenance, and decommissioning);
- > Pollution from site run-off affecting prey availability (construction and decommissioning);
- > Decreases in water quantity (construction); and
- > Decrease in air quality (construction and decommissioning).

43.1.5 The Conservation Objectives for the site are:

“Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

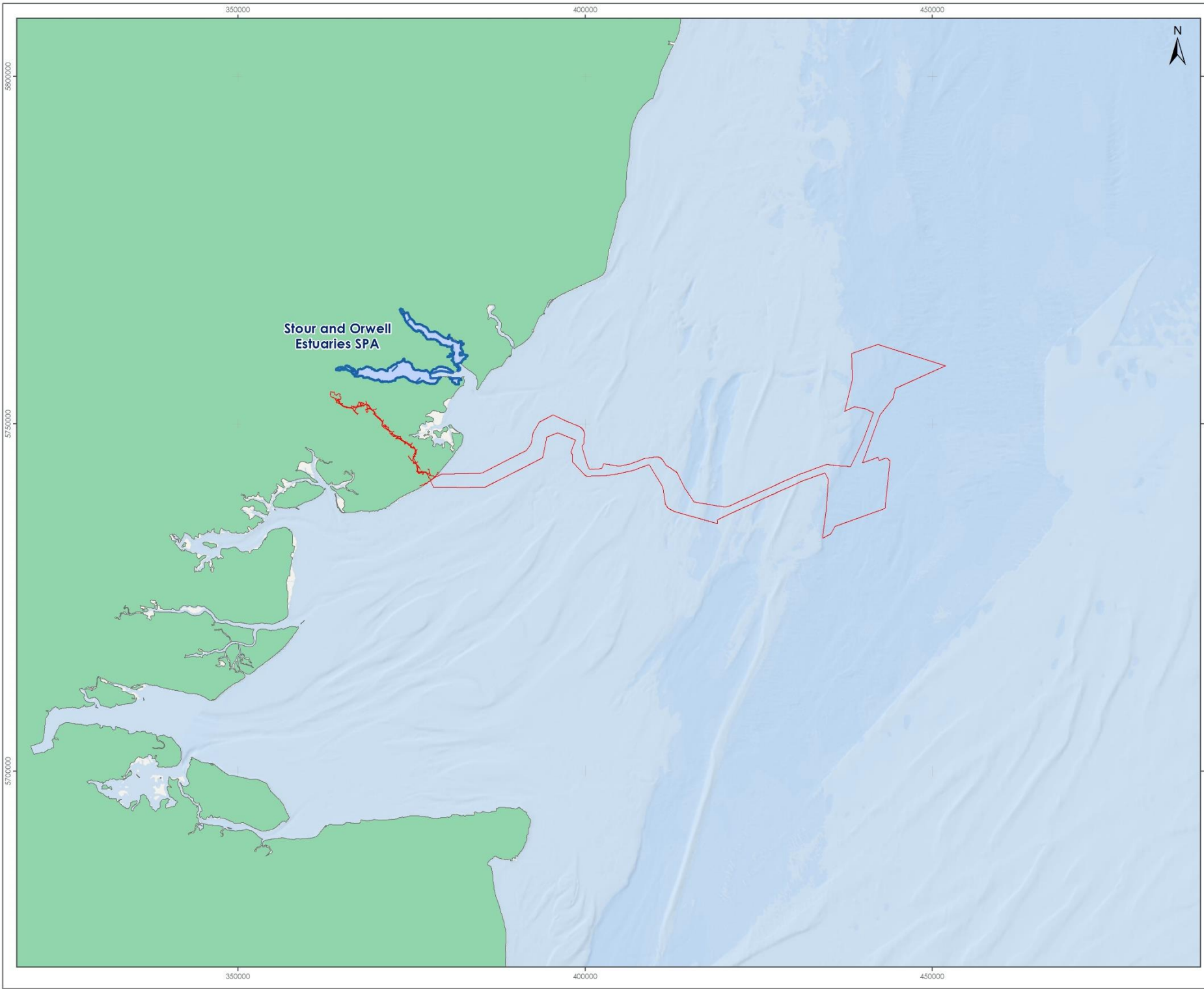
The extent and distribution of the habitats of the qualifying features

The structure and function of the habitats of the qualifying features

The supporting processes on which the habitats of the qualifying features rely

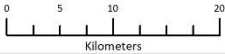
The population of each of the qualifying features, and,

The distribution of the qualifying features within the site.”



LEGEND

- Order Limits
- Special Protection Area



Data Source:
En: Garrin, GBCC, NOAA NGDC, and other contributors

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Stour and Orwell Estuaries SPA
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: **43.1**

SCALE: 1:50,000 | GRID: 1000 | DATUM: WGS84 | PROJECTION: UTM31N



44 STOUR AND ORWELL ESTUARIES RAMSAR

DISTANCE TO:

- > Array: 54.8 km
- > Offshore export cable corridor (ECC): 12.75 km
- > Onshore ECC: 3.15 km

44.1.1 The Stour and Orwell Estuaries Ramsar is an estuary comprising extensive mudflats, low cliffs, saltmarsh, and areas of vegetated shingle on the lower river reaches. The site supports internationally and nationally important numbers of numerous species of wintering wildfowl and waders. Several nationally scarce plants and invertebrates occur. The Ramsar is 3.1 km from the VE ECC. Key site information can be found in the JNCC Ramsar Information Sheet (RIS) and Ramsar Sites Information Service.⁹⁸

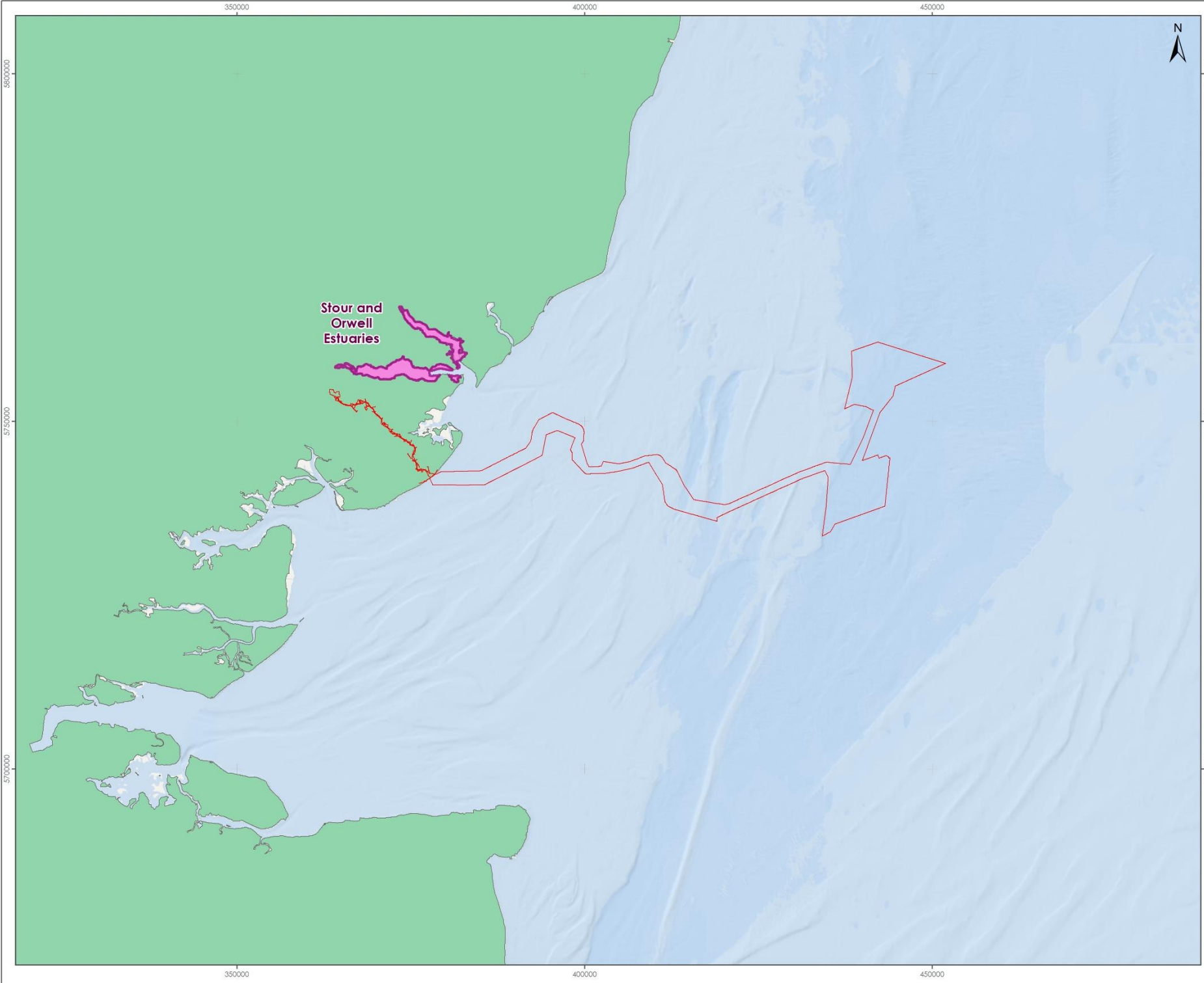
44.1.2 The Ramsar criteria for which the site is designated is described below, along with qualifying species:

- > Ramsar criterion 2: Contains seven nationally scarce plants:
 - > Stiff saltmarsh-grass *Puccinellia rupestris*;
 - > Small cord-grass *Spartina maritima*;
 - > Perennial glasswort *Sarcocornia perennis*;
 - > Lax-flowered sea lavender *Limonium humile*; and
 - > The eelgrasses *Zostera angustifolia*, *Z. marina* and *Z. noltei*.
- > Ramsar criterion 2: Contains five British Red Data Book invertebrates:
 - > The muscid fly *Phaonia fusca*;
 - > The horsefly *Haematopota grandis*;
 - > Two spiders, *Arctosa fulvolineata* and *Baryphema duffeyi*; and
 - > The endangered swollen spire snail *Mercuria confisa*.
- > Ramsar criterion 5: Assemblages of international importance; and
- > Ramsar criterion 6: Species/populations occurring at levels of international importance.
 - > Black-tailed godwit;
 - > Dark-bellied brent goose;
 - > Dunlin;
 - > Grey plover;
 - > Knot;

⁹⁸ <https://rsis.ramsar.org/ris/662>

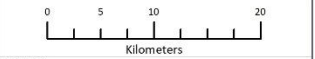
- > Pintail;
- > Redshank;
- > Important passage populations of redshank; and
- > Wintering waterbird assemblage.

44.1.1 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests.



LEGEND

- Order Limits
- Ramsar Site



Data Source:
Ordnance Survey, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
**Stour and Orwell Estuaries Ramsar
in relation to Five Estuaries**

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 44.1

SCALE: 1:500,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



45 WADDENZEE SCI

DISTANCE TO:

- > Array: 197 km
- > Offshore export cable corridor (ECC): 205 km.
- > Onshore ECC: 269 km

45.1.1 The Wadden Sea consists of a complex of deep channels and shallow water with sand and silt banks, large parts of which dry at low tide. These banks are intersected by a finely branched system of channels. Along the mainland and the islands there are scattered saltmarsh areas, which contribute to a very diverse flora and vegetation. The natural processes ensure the conservation and development of characteristic habitats and constantly change the boundaries of land and water. The receptor group 'marine mammals' is relevant to the Waddenzee SCI. Key literature sources, including relevant project literature, are as follows:

- > Volume 2, Chapter 7: Marine Mammals;
- > Volume 4, Annex 4.7.1: Marine Mammal Technical Baseline; and
- > Waddenzee SCI site information (in Dutch)⁹⁹.

45.1.2 The site is designated for the following Annex I habitats:

- > Sandbanks which are slightly covered by sea water all the time;
- > Estuaries;
- > Mudflats and sandflats not covered by seawater at low tide;
- > *Salicornia* and other annuals colonising mud and sand;
- > *Spartina* swards (*Spartinion maritimae*);
- > Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- > Embryonic shifting dunes;
- > Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes');
- > Fixed dunes with herbaceous vegetation ('grey dunes');
- > Dunes with *Hippophae rhamnoides*;
- > Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*); and
- > Humid dune slacks.

45.1.3 The following Annex II species:

- > Narrow-mouthed whorl snail (*Vertigo angustior*);
- > Sea lamprey (*Petromyzon marinus*);
- > River lamprey (*Lampetra fluviatilis*);
- > Twaite shad (*Alosa fallax*);
- > Tundra vole (*Microtus oeconomus*);

⁹⁹ <https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=1&id=n2k1>

- > Fen orchid (*Liparis loeselii*);
- > Harbour porpoise (*Phocoena phocoena*);
- > Harbour (common) seal (*Phoca vitulina*); and
- > Grey seal (*Halichoerus grypus*).

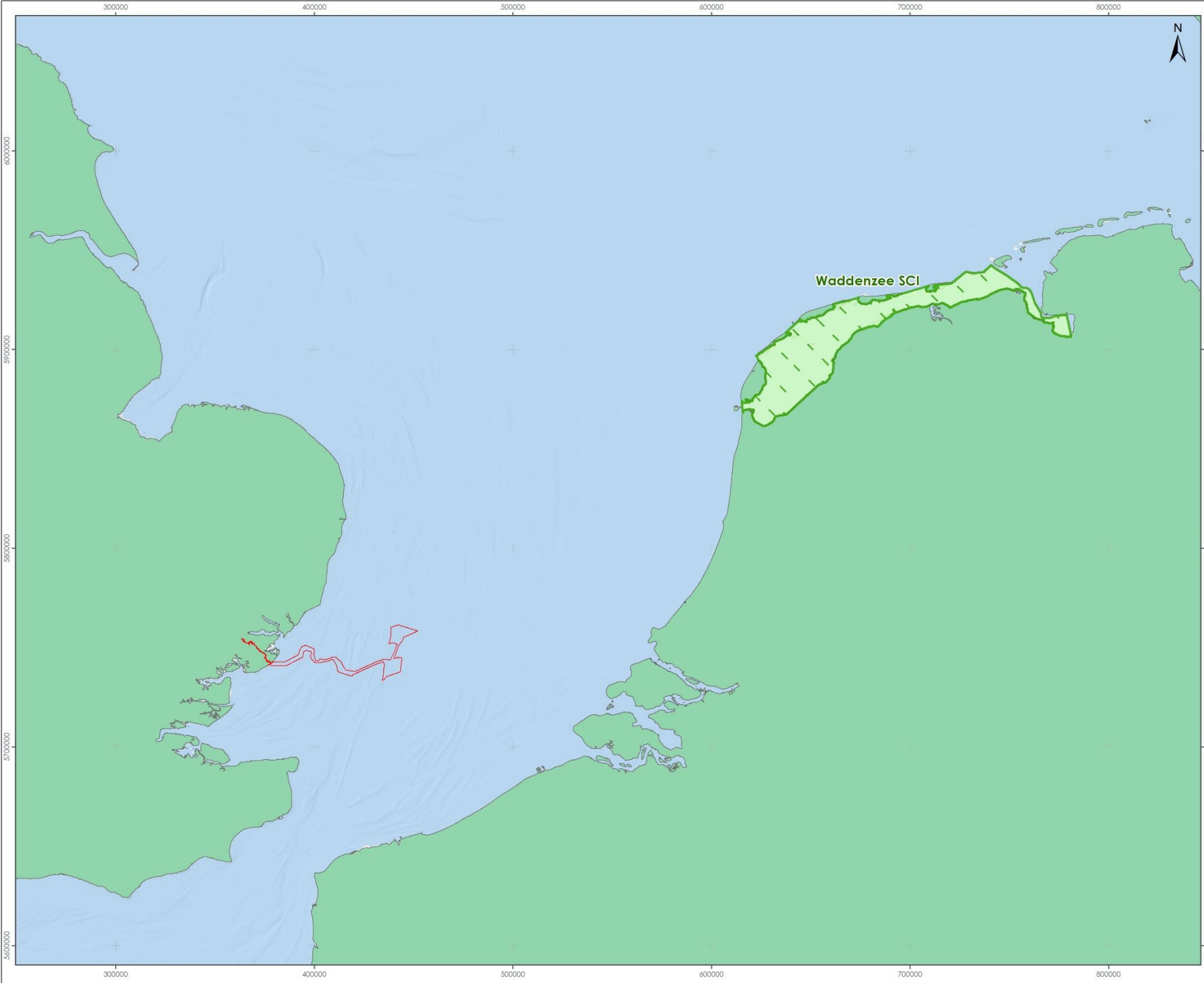
45.1.4 Potential for LSE has been identified for grey seal (*Halichoerus grypus*) only under the following scenarios:

- > Underwater noise (disturbance/TTS, PTS and barrier effect) (construction and decommissioning);
- > Habitat loss (construction and decommissioning);
- > Collision risk (construction, operations and maintenance and decommissioning);
- > Changes to prey (construction, operations and maintenance and decommissioning); and
- > Disturbance at haul out (construction, operations and maintenance and decommissioning).

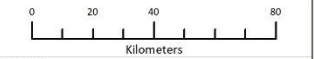
45.1.5 Additional information for the Waddenzee SCI can be found on the Ministry of Agriculture, Nature and Food Quality website¹⁰⁰, and includes national conservation status and conservation targets for the site features. For grey seal the conservation status is identified as 'moderately favourable'. The targets applicable to grey seal are listed below:

- > Conserve the area and quality of supporting habitat;
 - > Conserve the population size;
 - > Conservation of intertidal habitat as resting places for grey seal; and
20. Maintain undisturbed resting places and optimal breeding habitat for grey seal.

¹⁰⁰<https://www.synbiosys.alterra.nl/natura2000/gebiedendatabase.aspx?subj=n2k&groep=1&id=n2k1&topic=doelstelling>



- LEGEND**
- Order Limits
 - Special Area of Conservation



Data Source:
Eri, Garmin, GEBCO, NOAA NGDC, and other contributors.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
Waddenze SCI
in relation to Five Estuaries

VER	DATE	REMARKS	Drawn	Checked
1	14/03/2024	For Issue	BPHB	WH

DRAWING NUMBER: 45.1

SCALE: 1:1,000,000 PLOT SIZE: A3 EXTENT: WGS84 PROJECTION: UTM31N



46 REFERENCES

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- WWT & MacArthur Green, (2014), 'Strategic assessment of collision risk of Scottish offshore wind farms to migrating birds.', Scottish Marine and Freshwater Science Report. Marine Scotland Science.



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