

# Scotland England Green Link 2 - English Onshore Scheme

## Appendix 7F: Habitat Regulations Assessment Report

May 2022

For: National Grid Electricity Transmission

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# 1. Introduction

## 1.1 Overview

This report to inform a Habitats Regulations Assessment (HRA) by East Riding of Yorkshire Council and Selby Council has been prepared on behalf of National Grid Electricity Transmission (the Applicant) and Scottish and Southern Electricity Networks (SSEN). This report accompanies the Environmental Statement (ES) that will be submitted to the Local Planning Authorities (LPAs) and statutory consultees to inform the determination of an application for planning permission under the Town and Country Planning Act 1990.

## 1.2 The Project

The Project is a major reinforcement of the electricity transmission system which will provide additional north-south transmission capacity between northern Scotland and northern England. This reinforcement is essential to ensuring an efficient network that can facilitate achieving the net-zero target. The Project comprises the components described below:

- **Scottish Onshore Scheme:** A converter station located south of Peterhead. From the converter station there will be approx. 2 km of buried HVDC cable to a landfall at Sandford Bay. The converter station will be connected to an adjacent substation by approx. 500 m of High Voltage Alternating Current (HVAC) cable. The substation connects the Project to the existing transmission system;
- **Marine Scheme:** Approx. 436 km of subsea HVDC cable from Sandford Bay at Peterhead to the East Riding of Yorkshire coast at Barmston Sands, near Fraithorpe of which 150 km is located in Scottish waters before entering English waters for the remainder of the Project; and
- **English Onshore Scheme:** Approx. 69 km of underground HVDC cable from the landfall at Fraithorpe through East Riding of Yorkshire, across the River Ouse into Selby District to a proposed converter station at Drax, adjacent to the existing Drax Power Station. The proposed converter station will be connected to the existing substation at the Drax Power Station by approximately 500 m of HVAC cable. The substation connects the Project to the existing transmission system.

The Applicant is seeking planning permission for the construction and operation of the English Onshore Scheme.

**This HRA report focuses on the English Onshore Scheme only.** The Scottish Onshore Scheme and Marine Scheme are appraised in separate HRAs, which are cross-referred to in the main body of text where relevant. The location of the English Onshore Scheme in relation to European sites is shown in **Appendix A** and further detail on the relevant European sites is provided in **Table 1**.

### 1.2.1 The Landfall

The landfall is the interface between the English Onshore Scheme and the Marine Scheme, located in Fraithorpe (East Yorkshire), where the subsea cables will connect to the HVDC cables at a buried Transition Joint Tip (TJP). The TJP will be set back from the coastline, approx. 150 m from the Mean High Water Springs (MHWS). It comprises a permanent buried 60m<sup>2</sup> reinforced concrete chamber. A larger 100 m x 100 m compound area surrounding the TJP will be required to accommodate all temporary construction plant and equipment and parking / welfare facilities. The installation of the cable connections will be achieved through trenchless methods, likely to be Horizontal Directional Drilling (HDD), whereby a directional drill rig is used to install ducts for each of the HVDC cables, which will then be pulled through to the TJP. Site preparation works and drilling operations would be undertaken during normal working hours (8 am – 6 pm) for an expected duration of up to two months.

### 1.2.2 The Underground DC Cable Route

The English Onshore Scheme comprises two underground HVDC cables (and fibre optic cable(s)) that will be laid down within a single trench along the entire route between the landfall and the converter

station (discussed in the next section). For ease of description, and as shown in Appendix A, the proposed cable route has been split into the following four sections:

- Route Section 1 – Landfall to Bainton;
- Route Section 2 – Bainton to Market Weighton;
- Route Section 3 – Market Weighton to River Ouse; and
- Route Section 4 – River Ouse to Drax Substation

**Chapter 3: Description of the English Onshore Scheme** of the ES identifies the key characteristics of the cable route, the most relevant of which to the HRA process include the following:

- Length of route: Approx. 69km.
- Two HVDC cables will be laid in a single trench up to 1.5 m wide at a depth of between 1 and 1.5 m.
- Working width: 40 m (note that this will include all necessary space for the cable trench, cable joint bays, soil storage, materials and equipment laydown and temporary haul roads) subject to limits of deviation.
- Temporary construction facilities established at several locations along the route to accommodate access, drainage and construction compounds.
- Buried joint bays (approx. 72) where 800 m to 1.5 km cable sections will be connected with each other.

The HVDC cables will be installed using a combination of open cut and trenchless methods, depending on the terrain to be traversed and obstacles that are present. For example, open cut installation will be used where the cable route runs through open agricultural land. HDD is anticipated to be used where obstacles are encountered, including roads, railways and main rivers. Open cut direct burial involves the following key activities:

- Topsoil is stripped from and a trench dug across the entire working width using mechanical excavators and / or by hand, and stockpiled in construction compounds.
- Cables are pulled into the trench from cable drum and rollers 'fixing' it in place.
- Protective thermal material is laid down around the cables and protective tiles placed above.
- Back-filling of trench with excavated sub-soil and thermally suitable material (where required).
- Topsoil will be reinstated to the original soil profile and land re-seeded or released to the farmer for cultivation in line with pre-construction use.

HDD is likely to involve the following key stages, where the proposed cable route crosses an obstacle or feature, such as a waterbody:

- Installation of HDD rig and associated equipment at the launch site (including electricity supply and staff welfare facilities).
- Drilling of an adequately sized hole to accommodate the diameter of the HVDC cable.
- Subsequent stages of pulling duct towards the HDD rig and HVDC cable pulling across the obstacle.
- Topsoil will be reinstated to the original soil profile and land re-seeded or released to the farmer for cultivation in line with pre-construction use.

The underground HVDC cable installation is scheduled to take place over the course of approx. five years, indicatively starting in late 2024 and with the cable to be commissioned by the end of 2029. Since cable laying does not need to be sequential, any of the works described above may be undertaken in more than one location at any point in time. However, it is extremely unlikely that construction activities (e.g. trench digging or HDD) will take place along the entire route corridor at the same time. This is important for the context of HRA, since it means that only sections of the agricultural land adjoining the planning application boundary will be subject to visual and noise disturbance at a given time.

### 1.2.3 The Converter Station and Underground HVAC Cable Route

A converter station will be required for electricity conversion, which will be located immediately east of the existing Drax Power Station in an 8.5 ha agricultural field. The converter station will be situated in a fenced compound, comprising a series of large buildings (e.g. HDVC hall, valve halls, control building, transformer bays and spares building). Directional lighting will be required for safe movement of staff and machinery around the site compound. Six underground HVAC cables, approx. 500 m in length, will be installed using open-cut methods to connect the proposed converter station with the existing Drax substation. It is anticipated that construction of the proposed converter station will encompass the following key activities over a period of four years:

- Site establishment, including vegetation and soil removal to establish supporting infrastructure;
- Earthworks to re-profile land to a level platform and desired elevation above Ordnance Datum (OD); and
- Building works, including construction of building foundations, drainage systems, and erection of steel frames and cladding.

## 2. Legislative Framework

This is a technical report to inform and support the competent authorities (East Riding of Yorkshire Council and Selby District Council) in their decision making. As part of the decision making process it is legally necessary to consider whether the English Onshore Scheme is likely to have a significant impact on areas that have been internationally designated for nature conservation purposes (i.e. 'European sites'). This requirement is set out in the Conservation of Habitats and Species Regulations 2017 (as amended) (the 2017 Regulations). The 2017 Regulations apply the precautionary principle<sup>1</sup> to European Sites.

Over the years, the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the 2017 Regulations, from the screening for Likely Significant Effects (LSEs) through to identification of Imperative Reasons of Overriding Public Interest (IROPI). This has arisen in order to distinguish the overall process from the individual stage of "Appropriate Assessment". Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

If adverse effects on integrity are identified, mitigation should be considered to avoid those effects or reduce them to an insignificant level. However, where no alternative solution exists, and so an adverse effect on integrity remains, a further assessment should be made of whether the scheme is required for IROPI and whether there are any viable alternatives to delivering the objectives of the scheme without causing harm. If the scheme meets those IROPI and No Alternatives tests, compensatory measures will be required in order to maintain the integrity of the overall network of internationally important sites in the UK, known as the National Site Network (NSN). The HRA methodology is set out in Section 3.

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<sup>1</sup> The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as:

*"When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis".*

## 3. Assessment Methodology

### 3.1 Introduction

The HRA has been carried out with reference to the general EC guidance on HRA<sup>2</sup>, general guidance on HRA published by the UK government in July 2019<sup>3</sup> and February 2021<sup>4</sup>, and Planning Inspectorate (PINS) Advice Note 10<sup>5</sup> (even though the English Onshore Scheme does not require a DCO as it is not a NSIP).

The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). The Withdrawal Act retains the body of existing EU-derived law within our domestic law, meaning that legislation relating to nature conservation continues to apply within the UK. As such this HRA takes account of relevant EU case law (for instance, the *Holohan and People over Wind* cases, discussed below).

Box 2 below sets out the stages of HRA according to PINS Advice Note 10 as that document clearly sets out the HRA process applicable to all plans and projects (not just DCOs).

Whilst the HRA decisions must be taken by the competent authority (East Riding of Yorkshire Council in respect of the English Onshore Scheme within its administrative boundary and Selby District Council in respect of the English Onshore Scheme within its administrative boundary), the information needed to undertake the necessary assessments must be provided by the Applicant. This HRA provides the information needed for the competent authority to establish whether there are any Likely Significant Effects (LSEs) or, where those are found to be present, adverse effects on site integrity from the English Onshore Scheme.

### 3.2 HRA Stage 1 – Screening for Likely Significant Effects (LSEs)

The objective of HRA Stage 1 LSEs screening stage is to 'screen out' those aspects of the English Onshore Scheme that can, without any detailed appraisal, be concluded not to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction (i.e. a pathway) with European sites. The remaining aspects (if there are remaining aspects) are then taken forward to Appropriate Assessment. The assessment must consider the potential for effects in combination with other plans and projects.

This report has been prepared having regard to all relevant case law relating to the 2017 Regulations, the Habitats Directive and Birds Directive. This includes the ruling by the Court of Justice of the European Union (CJEU) in the case of *People Over Wind, Peter Sweetman v Coillte Teoranta* (C-323/17).

This case held that "*it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site*" (paragraph 40). This establishes that mitigation measures cannot be taken into account at the HRA Stage 1 LSEs screening stage, but they can be taken into account when undertaking an Appropriate Assessment at HRA Stage 2.

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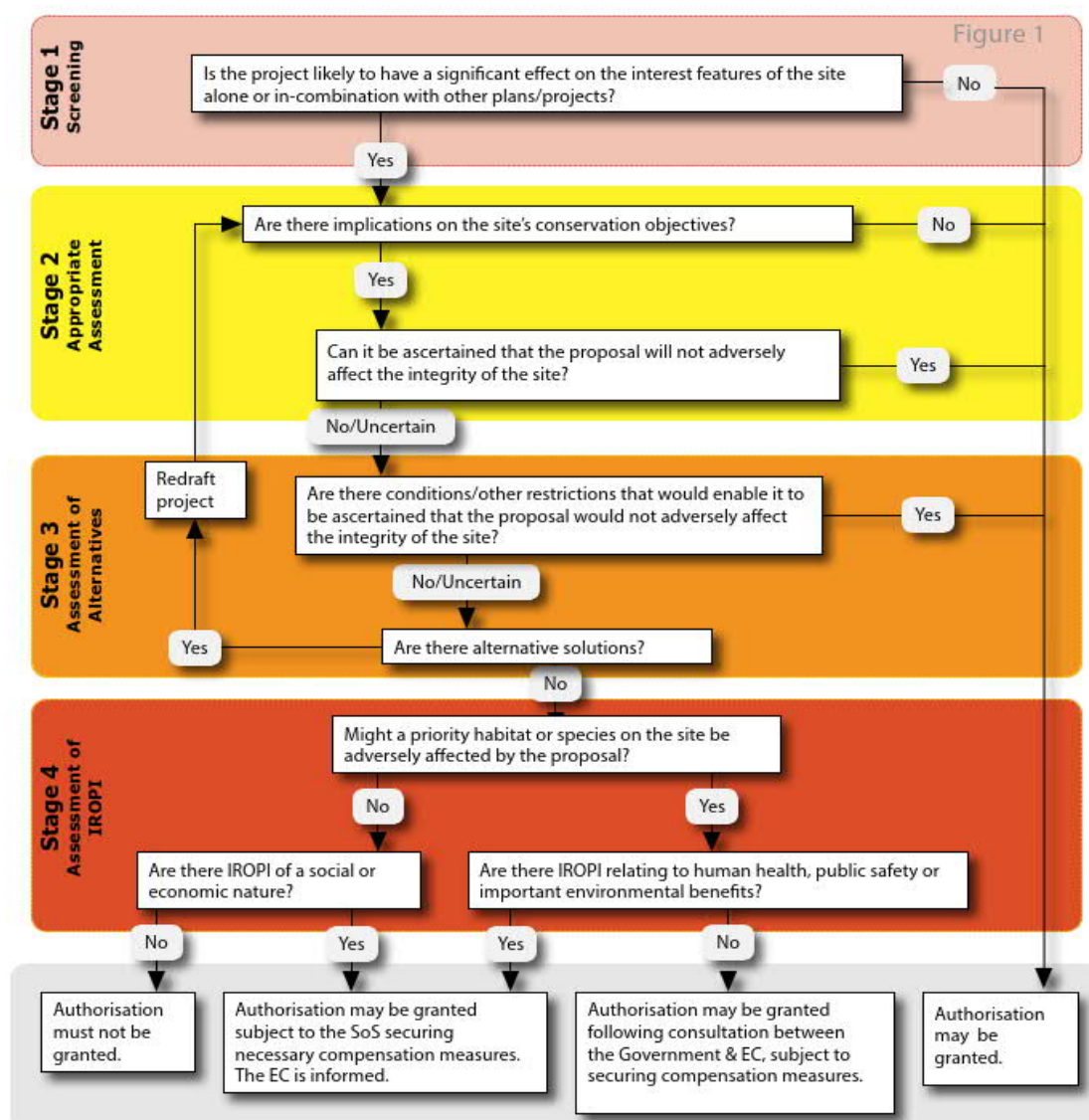
<sup>2</sup> European Commission. (2001). *Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Luxembourg: Office of Official Publications of the European Communities.

<sup>3</sup> Ministry of Housing, Communities & Local Government. (July 2019). *Guidance on the use Habitats Regulations Assessment*. Available at: <https://www.gov.uk/guidance/appropriate-assessment> [Accessed on the 25/04/2022]

<sup>4</sup> Department for Environment, Food & Rural Affairs. (2021, February 24). *How a competent authority must decide if a plan or project proposal that affects a European site can go ahead*. Available at: <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site> [Accessed on the 25/04/2022]

<sup>5</sup> The Planning Inspectorate. (November 2017). *Advice Note Ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects*, Version 8. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/> [Accessed on the 25/04/2022]





**Box 1. Four Stage approach to Habitats Regulations Assessments of Projects.**

### 3.3 HRA Stage 2 – Appropriate Assessment

Where it is determined that a conclusion of ‘no Likely Significant Effect’ cannot be drawn, the HRA assessment proceeds to the next stage of HRA known as HRA Stage 2 - Appropriate Assessment. Case law has clarified that ‘Appropriate Assessment’ is not a technical term. In other words, there are no specific technical analyses, or level of detail, that are classified by law as belonging to Appropriate Assessment rather than the screening for LSEs. The Appropriate Assessment constitutes whatever level of further assessment is required to determine whether an adverse effect on the integrity of a European site would arise as a result of the English Onshore Scheme.

By virtue of the fact that HRA Stage 2 – Appropriate Assessment follows the screening process, there is an understanding that the analysis will be more detailed than that undertaken at the previous stage. One of the key considerations during HRA Stage 2 - Appropriate Assessment is whether there is available mitigation that would address the potential effect, allowing for a conclusion of no adverse effect on integrity. In practice, HRA Stage 2 – Appropriate Assessment takes any element of the English Onshore Scheme that could not be excluded as having LSEs following HRA Stage 1 and assesses the potential for an effect in more detail, with a view to concluding whether that element would cause an adverse effect on site integrity for a European site. Adverse effects on a European site’s integrity include disruption of the coherent structure and function of the European site(s) and the ability of the site to achieve its Conservation Objectives.

In 2018 the Holohan ruling was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that *'As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, ... typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area'* [emphasis added]. This ruling has been considered in relation to the English Onshore Scheme, particularly with regard to mobile qualifying species in the Humber Estuary SPA / Ramsar, Lower Derwent Valley SPA / Ramsar, Lower Derwent Valley SAC and River Derwent SAC.

### 3.4 The Rochdale Envelope

In July 2018, the Planning Inspectorate published Advice Note Nine: Rochdale Envelope (The Planning Inspectorate, 2018), explaining how the principles of the Rochdale Envelope should be used by planning applications for the Environmental Impact Assessment (EIA) process.

The Rochdale Envelope<sup>6</sup> is applicable where some of the details of a scheme cannot be confirmed when an application is submitted, and flexibility is needed to address uncertainty. Notwithstanding, all significant potential effects of schemes must be properly addressed.

The Rochdale Envelope encompasses three key principles:

- The assessment should adopt a cautious worst-case approach;
- The level of information assessed should be sufficient to enable the Likely Significant Effects and / or adverse effects of a scheme to be assessed; and
- The allowance for flexibility should not be abused to provide inadequate descriptions of projects.

This HRA has given due consideration to the Rochdale Envelope. The worst-case (i.e. the potentially most impactful) construction/decommissioning and operational scenarios have been assessed in relation to impact pathways. For example, while the working width of the cable laying trenches are anticipated to be 40 m wide, this HRA assumes a Limit of Deviation (LoD) of 10 m either side of the working width, thus considering the worst-case parameters within which the English Onshore Scheme will be delivered.

Throughout this HRA construction impacts and decommissioning impacts on European sites are likely to be very similar in type, magnitude and effect. As such they are treated together.

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<sup>6</sup> The Rochdale Envelope arises from two cases: R. v Rochdale MBC ex parte Milne (No.1) and R. v Rochdale MBC ex parte Tew [1999], which are cases that dealt with outline planning applications for a proposed business park in Rochdale.

## 4. Baseline Evidence Gathering

### 4.1 Scope of the Project

There is no guidance that dictates the general physical scope of an HRA document as the potential Zone of Impact (Zol) is dependent on specific impact pathways. Therefore, in considering the physical scope of the assessment, we were guided primarily by the identified impact pathways (called the source-pathway-receptor model).

Briefly defined, impact pathways are routes by which the implementation of a project can lead to an effect upon a European designated site. An example of this would be visual and noise disturbance arising from the construction/decommissioning work or operational phase associated with a project. If there are sensitive ecological receptors within a nearby European site (e.g. non-breeding overwintering birds), this could alter their foraging and roosting behaviour and potentially affect the site's integrity. For some impact pathways (notably air pollution) there is guidance that sets out distance-based zones required for assessment. For others, a professional judgment must be made based on the best available evidence.

### 4.2 Relevant European Sites

It is noted that the Project will comprise three key components, including the onshore works at Sandford Bay and Peterhead (Scottish Onshore Scheme), the marine works in Scottish and English waters (Marine Scheme) and the onshore works at Fraisthorpe and Drax (English Onshore Scheme).

Given these cross-habitat scheme components, there may be linkages and overlaps of impact pathways between different elements of the scheme. Since any HRA must be in combination with other plans and projects, the HRA of the English Onshore Scheme will need to consider marine / coastal as well as inland / terrestrial European sites.

This report will focus in the first instance on the potential impacts of the English Onshore Scheme alone. Separate HRA reports cover the Scottish Onshore Scheme and Marine Scheme respectively. A list of other plans and projects is provided and discussed in the in-combination assessment in Chapter 7.

The English Onshore Scheme does not traverse any European site. However, various designated sites lie within a 10km Zol of the indicative planning application boundary, and may be impacted through the construction, operation and decommissioning periods associated with the English Onshore Scheme (see Appendix A which shows the location of European sites in relation to the planning application boundary of the English Onshore Scheme). For example, this could be because these sites support mobile bird, fish or mammal species for which European sites are designated and which potentially frequent the area traversed by the English Onshore Scheme, or due to impact pathways extending some distance beyond the working area of the scheme.

**Table 1. Summary of the European sites traversed by or within a Zone of Influence (Zoi) of 10 km of the English Onshore Scheme<sup>7</sup>.**

European site	Approx. distance from the indicative alignment	Qualifying species/habitats	Threats and pressure to site integrity	Potential impact pathways linking to the English Onshore Scheme
The Humber Estuary SAC	2.8 km south east of the planning application boundary	<p>Habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>– Estuaries</li> <li>– Mudflats and sandflats not covered by seawater at low tide</li> </ul> <p>Habitats and species present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> <li>– Sandbanks which are slightly covered by sea water all the time</li> <li>– Coastal lagoons</li> <li>– Salicornia and other annuals colonizing mud and sand</li> <li>– Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</li> <li>– Embryonic shifting dunes</li> <li>– Shifting dunes along the shoreline with <i>Ammophila arenaria</i></li> <li>– Fixed coastal dunes with herbaceous vegetation</li> <li>– Dunes with <i>Hippopha rhamnoides</i></li> <li>– Sea lamprey <i>Petromyzon marinus</i></li> <li>– River lamprey <i>Lampetra fluviatilis</i></li> <li>– Grey seal <i>Halichoerus grypus</i></li> </ul>	<ul style="list-style-type: none"> <li>– Water Pollution</li> <li>– Coastal squeeze</li> <li>– Changes in species distributions</li> <li>– Invasive species</li> <li>– Natural changes to site conditions</li> <li>– Public Pressure Access/Disturbance</li> <li>– Fisheries: Fish stocking</li> <li>– Fisheries: Commercial Pressure marine and estuarine</li> <li>– Direct land take from development</li> </ul>	<p><b>Construction period:</b></p> <p>Water pollution (dust and synthetic / non-synthetic pollutants mobilized in surface runoff)</p> <p>Atmospheric pollution (nitrogen deposition from construction vehicles, such as Heavy Duty Vehicles (HDVs))</p>
The Humber SPA / Ramsar	2.8 km south east of the planning application boundary	<p>Resident species:</p> <ul style="list-style-type: none"> <li>– Avocet <i>Recurvirostra avosetta</i></li> <li>– Bittern <i>Botaurus stellaris</i></li> <li>– Hen harrier <i>Circus cyaneus</i></li> <li>– Golden plover <i>Pluvialis apricaria</i></li> </ul>	<ul style="list-style-type: none"> <li>– Problematic native species</li> <li>– Changes in abiotic conditions</li> <li>– Changes in biotic conditions</li> </ul>	<p><b>Construction period:</b></p> <p>Loss of functionally linked habitat (temporary + permanent)</p>

<sup>7</sup> For a full summary of European sites, including an introduction to sites, Ramsar qualifying features and Conservation Objectives, please refer to Appendix B.

European site	Approx. distance from the indicative alignment	Qualifying species/habitats	Threats and pressure to site integrity	Potential impact pathways linking to the English Onshore Scheme
		<ul style="list-style-type: none"> <li>- Bar-tailed godwit <i>Limosa lapponica</i></li> <li>- Ruff <i>Philomachus pugnax</i></li> <li>- Bittern <i>Botaurus stellaris</i></li> <li>- Marsh harrier <i>Circus aeruginosus</i></li> <li>- Avocet <i>Recurvirostra avosetta</i></li> <li>- Little tern <i>Sternula albifrons</i></li> </ul> <p>Migratory species:</p> <ul style="list-style-type: none"> <li>- Shelduck <i>Tadorna tadorna</i></li> <li>- Knot <i>Calidris canutus</i></li> <li>- Dunlin <i>Calidris alpina</i></li> <li>- Black-tailed godwit <i>Limosa limosa</i></li> <li>- Redshank <i>Tringa totanus</i></li> <li>- Knot <i>Calidris canutus</i></li> <li>- Dunlin <i>Calidris alpina</i></li> <li>- Black-tailed godwit <i>Limosa limosa</i></li> <li>- Redshank <i>Tringa totanus</i></li> </ul>	<ul style="list-style-type: none"> <li>- Abiotic (slow) natural processes</li> <li>- Outdoor sports and leisure activities, recreational activities</li> </ul>	<p>Visual and noise disturbance (in functionally linked habitat)</p> <p>Water pollution (dust and synthetic / non-synthetic pollutants mobilized in surface runoff)</p> <p>Atmospheric pollution (nitrogen deposition from construction vehicles, such as Heavy Duty Vehicles)</p>
River Derwent SAC	1.2 km north west of the planning application boundary	<p>Annex I habitats present as a qualifying feature but not a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>- Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and Callitricho-Batrachion vegetation</li> </ul> <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>- River lamprey <i>Lampetra fluviatilis</i></li> </ul> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> <li>- Sea lamprey <i>Petromyzon marinus</i></li> <li>- Bullhead <i>Cottus gobio</i></li> <li>- Otter <i>Lutra lutra</i></li> </ul>	<ul style="list-style-type: none"> <li>- Physical modification</li> <li>- Water pollution</li> <li>- Invasive species</li> <li>- Change in land management</li> <li>- Water abstraction</li> </ul>	<p><b>Construction period:</b></p> <p>Disruption of species mobility (migratory fish, ranging otters)</p> <p>Visual and noise disturbance to otters in holts</p> <p>Water pollution (dust and synthetic / non-synthetic pollutants mobilized in surface runoff)</p>

European site	Approx. distance from the indicative alignment	Qualifying species/habitats	Threats and pressure to site integrity	Potential impact pathways linking to the English Onshore Scheme
Lower Derwent Valley SAC	3.4 km north-west of the planning application boundary	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>– Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>)</li> </ul> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>– Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)</li> </ul> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> <li>– Otter <i>Lutra lutra</i></li> </ul>	<ul style="list-style-type: none"> <li>– Hydrological changes</li> <li>– Drainage</li> <li>– Public access / disturbance</li> <li>– Invasive species</li> <li>– Undergrazing</li> <li>– Inappropriate scrub control</li> <li>– Air pollution: Impact of atmospheric nitrogen deposition</li> </ul>	<p><b>Construction period:</b></p> <p>Disruption of species mobility (migratory fish, ranging otters)</p> <p>Visual and noise disturbance to otters in holts</p> <p>Water pollution (dust and synthetic / non-synthetic pollutants mobilized in surface runoff)</p>
Lower Derwent Valley SPA / Ramsar	3.4 km north-west of the planning application boundary	<p>Non-breeding species:</p> <ul style="list-style-type: none"> <li>– Bewick's swan <i>Cygnus columbianus bewickii</i></li> <li>– European golden plover <i>Pluvialis apricaria</i></li> <li>– Ruff <i>Philomachus pugnax</i></li> </ul> <p>Breeding species:</p> <ul style="list-style-type: none"> <li>– Northern shoveler <i>Anas clypeata</i></li> <li>– Eurasian wigeon <i>Anas penelope</i></li> <li>– Eurasian teal <i>Anas crecca</i></li> </ul> <p>Waterbird assemblage of over 20,000 wintering waterfowl</p>	<ul style="list-style-type: none"> <li>– Hydrological changes</li> <li>– Drainage</li> <li>– Public access / disturbance</li> <li>– Invasive species</li> <li>– Undergrazing</li> <li>– Inappropriate scrub control</li> <li>– Air pollution: Impact of atmospheric nitrogen deposition</li> </ul>	<p><b>Construction period:</b></p> <p>Loss of functionally linked habitat (temporary + permanent)</p> <p>Visual and noise disturbance (in functionally linked habitat)</p> <p>Water pollution (dust and synthetic / non-synthetic pollutants mobilized in surface runoff)</p> <p>Atmospheric pollution (nitrogen deposition from construction vehicles, such as Heavy Duty Vehicles)</p>
Skipwith Common SAC	8.8 km to the north-east of the planning application boundary	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>– Northern Atlantic wet heaths with <i>Erica tetralix</i></li> </ul> <p>European dry heaths</p>	<ul style="list-style-type: none"> <li>– Public access / disturbance</li> <li>– Inappropriate scrub control</li> <li>– Drainage</li> </ul>	<p>The Skipwith Common SAC is designated for two heathland habitat types that are potentially sensitive to changes in air quality, water quality and water level. However, due to the relatively long distance to the English Onshore Scheme (approximately 8.8 km), it is</p>

European site	Approx. distance from the indicative alignment	Qualifying species/habitats	Threats and pressure to site integrity	Potential impact pathways linking to the English Onshore Scheme
			<ul style="list-style-type: none"> <li>– Air pollution: Impact of atmospheric nitrogen deposition</li> </ul>	concluded that there are no linking impact pathways to the SAC.
Thorne and Hatfield Moors SPA	8.8 km to the south-west of the planning application boundary	Qualifying species European nightjar <i>Caprimulgus europaeus</i>	<ul style="list-style-type: none"> <li>– Drainage</li> <li>– Inappropriate scrub control</li> <li>– Air pollution: Impact of atmospheric nitrogen deposition</li> <li>– Public access / disturbance</li> <li>– Planning permissions</li> <li>– Peat extraction</li> <li>– Invasive species</li> </ul>	The Thorne and Hatfield Moors SPA is designated for breeding European nightjar. However, this species is not sensitive to the main impact pathways related to the English Onshore Scheme. Furthermore, due to the relatively long distance to the English Onshore Scheme (approximately 8.8 km), it is concluded that the SPA lies beyond the Zol of the English Onshore Scheme.
Thorne Moor SAC	8.8 km to the south-west of the planning application boundary	Annex I habitats that are a primary reason for selection of this site Degraded raised bogs still capable of natural regeneration	<ul style="list-style-type: none"> <li>– Drainage</li> <li>– Inappropriate scrub control</li> <li>– Air pollution: Impact of atmospheric nitrogen deposition</li> <li>– Public access / disturbance</li> <li>– Planning permissions</li> <li>– Peat extraction</li> <li>– Invasive species</li> </ul>	The Thorne Moor SAC is designated for degraded raised bogs that are potentially sensitive to changes in air quality, water quality and water level. However, due to the relatively long distance to the English Onshore Scheme (approximately 8.8 km), it is concluded that there are no linking impact pathways to this SAC.
Flamborough Head SAC	3.5 km north-east of the planning application boundary	Annex I habitats that are a primary reason for selection of this site <ul style="list-style-type: none"> <li>– Reefs</li> <li>– Vegetated sea cliffs of the Atlantic and Baltic Coasts</li> <li>– Submerged or partially submerged sea caves</li> </ul>	<ul style="list-style-type: none"> <li>– Changes in species distributions</li> <li>– Marine and freshwater fishery</li> <li>– Public access / disturbance</li> <li>– Invasive species</li> </ul>	This European site comprises marine habitats, which will not be impacted by the English Onshore Scheme. There are no impact pathways linking to the English Onshore Scheme.
Flamborough and Filey Coast SPA	5.6 km north-east of the planning application boundary	Qualifying species <ul style="list-style-type: none"> <li>– Gannet <i>Morus bassanus</i></li> <li>– Guillemot <i>Uria aalge</i></li> <li>– Kittiwake <i>Rissa tridactyla</i></li> <li>– Razorbill <i>Alca torda</i></li> </ul>	<ul style="list-style-type: none"> <li>– Changes in species distributions</li> <li>– Marine and freshwater fishery</li> <li>– Public access / disturbance</li> </ul>	This European site is designated for seabird species that nest in specialized habitats (e.g. cliffs and rocky outcrops) and forage in the marine environment. There are no impact pathways linking to the English Onshore Scheme.

European site	Approx. distance from the indicative alignment	Qualifying species/habitats	Threats and pressure to site integrity	Potential impact pathways linking to the English Onshore Scheme
Greater Wash SPA	2.4 km north-east of the planning application boundary	<ul style="list-style-type: none"> <li>- Seabird assemblage</li> <li>Qualifying species               <ul style="list-style-type: none"> <li>- Red-throated diver <i>Gavia stellata</i></li> <li>- Common scoter <i>Melanitta nigra</i></li> <li>- Little gull <i>Hydrocoloeus minutus</i></li> <li>- Sandwich tern <i>Sterna sandvicensis</i></li> <li>- Common tern <i>Sterna hirundo</i></li> <li>- Little tern <i>Sternula albifrons</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Invasive species</li> <li>- Public access / disturbance</li> <li>- Siltation</li> <li>- Fisheries: Recreational marine and estuarine</li> <li>- Invasive species</li> <li>- Inappropriate coastal management</li> <li>- Fisheries: Commercial marine and estuarine</li> <li>- Predation</li> <li>- Changes in species distributions</li> </ul>	<p>This European site is designated for its importance in supporting seabirds that forage in the marine environment. There are no impact pathways linking to the English Onshore Scheme.</p>



## 4.3 In Combination Scope

It is a requirement of Regulation 63(a) of the 2017 Regulations to not only assess the impacts of a development project alone, but also to investigate whether there is a potential for in-combination effects with other projects or plans. In practice, such in-combination assessment is of greatest relevance when an impact pathway relating to a project would otherwise be screened out – not because it is not present – but because its individual contribution is considered not to result in LSEs.

For the purposes of this HRA, several plans, projects and strategies proposing / aiming for development have been identified, which may act in-combination with the English Onshore Scheme, including the Marine Scheme and Scottish Onshore Scheme (both elements of the Project), as well as SEGL1 (another HVDC project connecting Scotland and England). Furthermore, several unrelated projects are proposed in the marine and terrestrial environment in the wider area of the English Onshore Scheme, including Hornsea 4 Offshore Wind Farm, Drax Bioenergy with CCS and the Humber Low Carbon Pipelines. The significance of potential in-combination plans and projects are discussed in Chapter 7.

## 5. Screening for Likely Significant Effects (LSEs)

### 5.1 Introduction

### 5.2 Impact Pathway Summary

**Table 2** below provides an overview of the most likely impact pathways associated with the installation of underground HVDC cables, installed via HDD or laid within open-cut trenches, between the landfall at Fraisthorpe, and the construction and operation of a converter station at Drax. The likely impact pathways were identified using prior ecological knowledge, appraising the sensitivity of European sites.

**Table 2 Likely impact pathways associated with the construction and operation of the English Onshore Scheme**

Stage of Development	Impact Pathways	Details	Zone of Influence (Zoi)	Potentially Impacted European Sites
Construction	Loss of functionally linked land (FLL) <sup>8</sup>	Where development takes place on greenfield sites that are known to support >1% of the qualifying populations of SPA / Ramsar species, such FLL is at risk of being lost.	Depends on the foraging ecology of qualifying species, potentially extending to 20km for Bewick's swans	<ul style="list-style-type: none"> <li>Lower Derwent Valley SPA / Ramsar</li> <li>Humber Estuary SPA / Ramsar</li> </ul>
	Visual and noise disturbance (in FLL)	Visual and noise disturbance will occur within designated sites and areas that are functionally linked to noise from the installation of the underground cables and joining of the subsea cables.	Potentially several hundred metres from the working width	<ul style="list-style-type: none"> <li>Lower Derwent Valley SPA / Ramsar</li> <li>Humber Estuary SPA / Ramsar</li> </ul>
	Water Quality	Dust and chemical run-off	Dust – 50m <sup>9</sup>	<ul style="list-style-type: none"> <li>River Derwent SAC</li> </ul>
			Run-off - no specific distance but very likely to be within a few hundred metres at most	<ul style="list-style-type: none"> <li>Lower Derwent Valley SPA / Ramsar / SAC</li> <li>Humber Estuary SPA / Ramsar / SAC</li> </ul>
Disruption of species mobility (anadromous fish and otter)	Many animal species have large home ranges that extend far beyond European site boundaries. For example, anadromous fish undertake seasonal migrations between the marine environment and	Dependent on species ecology, therefore requiring site-specific assessments (such as appraisal of meta-populations	<ul style="list-style-type: none"> <li>River Derwent SAC</li> <li>Lower Derwent Valley SAC</li> </ul>	

<sup>8</sup> This impact pathway will initially arise temporarily in the construction period, but may extend into the operational period where permanent hardstanding is required and / or FLL habitat parcels are subject to continued significant disturbance.

<sup>9</sup> For the purposes of screening, according to guidance from the Institute of Air Quality Management, with respect to possible effects due to dust, "an assessment will normally be required where there is...an 'ecological receptor' within: 50m of the boundary of the site; or 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s)". Source: IAQM. (2016) Guidance on the assessment of dust from demolition and construction. The Institute of Air Quality Management. Version 1.1.

Stage of Development	Impact Pathways	Details	Zone of Influence (Zol)	Potentially Impacted European Sites
		SACs designated for their breeding habitat. Male otters in particular have large home ranges that require mobility along riverbanks including beyond designated site boundaries.	and / or hydrological linkages)	
Operation	Water Quality	Dust and chemical run-off	Dust – 50m <sup>10</sup>  Run-off - no specific distance but very likely to be within a few hundred metres at most	<ul style="list-style-type: none"> <li>• River Derwent SAC</li> <li>• Lower Derwent Valley SPA / Ramsar</li> <li>• Humber Estuary SPA / Ramsar / SAC</li> </ul>
Decommissioning	The impact pathways associated with decommissioning are similar in nature and equal (or lesser) in magnitude to those in the construction period. Therefore, these impacts are not separately assessed in this HRA.			

## 5.3 Construction Period

### 5.3.1 Loss of Functionally Linked Land (Temporary)

#### 5.3.1.1 Humber Estuary SPA / Ramsar & Lower Derwent Valley SPA / Ramsar

While most European sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not always the case. A diverse array of qualifying species including birds, bats and amphibians are not always confined to the boundary of designated sites.

For example, the highly mobile nature of both wader and waterfowl species implies that areas of habitat of crucial importance to the integrity of their populations lie outside the physical limits of European sites. Despite not being part of the formal designation, these habitats are integral to the maintenance of the structure and function of the designated site, for example by encompassing important foraging grounds. Therefore, land use plans that may affect such FLL require further assessment.

The most widely used parameter for determining whether a parcel of land constitutes significant FLL for an SPA / Ramsar is whether it regularly supports more than 1 % of the SPA population of a qualifying species.

There are two European sites within the Zol of the English Onshore Scheme that are designated for bird species, which routinely utilise habitats beyond site boundaries, comprising the Lower Derwent Valley SPA / Ramsar and Humber Estuary SPA / Ramsar. The Humber Estuary SPA / Ramsar is designated for a range of bird species, including birds of prey (e.g. hen and marsh harrier), waterfowl (e.g. shelduck) and waders (e.g. golden plover and lapwing). The Lower Derwent Valley SPA / Ramsar is designated for a range of bird species, including ducks (e.g. teal and shoveler), golden plover and Bewick's swan. All these qualifying species are mobile, meaning that they can routinely roost and forage beyond the designated site boundary. Some bird species, notably Bewick's swan, golden plover and

<sup>10</sup> For the purposes of screening, according to guidance from the Institute of Air Quality Management, with respect to possible effects due to dust, "an assessment will normally be required where there is...an 'ecological receptor' within: 50m of the boundary of the site; or 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s)". Source: IAQM. (2016) Guidance on the assessment of dust from demolition and construction. The Institute of Air Quality Management. Version 1.1.

lapwing, have stronger associations with FLL, especially agricultural land parcels. Off-site arable fields can support significant assemblages of these species (i.e. more than 1 % of the qualifying population of a European site), being essential to maintaining the integrity of SPAs / Ramsars. Natural England's Impact Risk Zones Guidance Summary<sup>11</sup> provides advice on the maximum foraging distances of protected bird species, helping in delineating potential impact zones surrounding development proposals. For example, wintering lapwings and golden plovers (both contained in Bird Group 5), have maximum foraging distances of between 15-20 km. The document also advises that developments affecting functionally linked habitats within 10 km of a designated SSSI (or SPA / Ramsar) may impact significantly on designated populations. At its closest point, the English Onshore Scheme is located approximately 2.8 km to the north-west of the Humber Estuary SPA / Ramsar, well within the routine foraging distances of qualifying bird species. Similarly, the Lower Derwent Valley SPA / Ramsar, at its closest point located approximately 3.4 km from the planning application boundary within Section 3, is also designated for two species that are routinely present in agricultural land, including Bewick's swan and golden plover.

Notably, Route Section 3 (Market Weighton to River Ouse), the part of the English Onshore Scheme that lies closest to both SPAs / Ramsars, runs through a predominantly rural landscape with numerous agricultural land parcels. The underground cables will be laid using open-cut methods, which poses a risk of potential temporary loss of functionally linked habitat within the working width of the trenches. As a worst case, from preparatory works to habitat reinstatement, temporary habitat loss may occur over a period of up to five years.

**Appendix 7D: Ornithology Report** of the ES establishes a baseline of bird records along the English Onshore Scheme. This comprises a combination of desk study records (obtained from a range of organisations, including the BTO, RSPB and record data centres) and breeding / wintering bird surveys in the focal areas around the proposed landfall and converter station of the English Onshore Scheme. The BTO desk study results indicate that several qualifying species have been reported in a 1 km zone of search surrounding the planning application boundary. For example, data from the North and East Yorkshire Ecological Data Centre indicate that both hen and marsh harrier were returned for the 1 km buffer zone. Furthermore, records of golden plover are documented in non-estuarine waterbird surveys undertaken by the BTO. Based on the available evidence, it is reasonable to assume that qualifying species associated with both SPAs / Ramsars will be using foraging habitat that is to be traversed by the English Onshore Scheme. However, as highlighted in the Ornithology Report, the data search exercises do not indicate that habitat within the planning application boundary is likely to support significant numbers of qualifying waterfowl.

Furthermore, it is noted that the working corridor along the entire cable route will have a maximum width of 40 m (60 m with the assumed LoD) and any habitat loss associated with the cable corridor installation will be temporary. Clearly, the installation of the HVDC cables may result in the temporary loss of functionally linked habitat in localised areas within agricultural fields. **Chapter 3: Description of the English Onshore Scheme** of the ES states that the cables will be laid in sections of approx. 800m to 1.5km in length. In line with the Rochdale Envelope, given that the precise methodology is subject to the preferred approach of the contractor, it is assumed that entire sections of 1.5 km would be opened at once. While the cable-laying will occur in phases and open-cut trenching will not occur along the entire length of the English Onshore Scheme, it is noted that up to four teams may be working on different sections of the route at any given point in time. Assuming as a worst-case that the working areas entirely comprise suitable farmland, this would result in a maximum temporary loss of potential supporting habitat of approximately 360,000 m<sup>2</sup> (36 ha) in a given working period, although this will be spread over a large geographic area rather than being in a block.

Despite this temporary habitat loss, large areas of the agricultural parcels adjoining the English Onshore Scheme will be unaffected, amounting to thousands of hectares. As such, this overall temporary loss is unlikely to have likely significant implications at the population level, particularly given the ubiquity of arable fields in the wider region surrounding the Humber Estuary. In practice, the nature of farmland in the wider foraging / roosting zone around an SPA / Ramsar is that pockets of habitat will be moving in and out of suitability constantly due farm management. What is important is the long-term preservation of a sufficiently large amount of foraging habitat in the wider landscape around designated sites. Even

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<sup>11</sup> Natural England. (March 2019). Impact Risk Zones Guidance Summary – Sites of Special Scientific Interest Notified for Birds. Version 1.1. 8pp.

if a small amount of foraging habitat is temporarily lost, this will not affect the long-term cumulative resource availability to SPA / Ramsar birds, particularly given that the habitats involved are widespread and easily recreated and the original land use of impacted fields will be reinstated immediately following completion of the works.

Overall, given the relatively small amount of agricultural land affected, the temporary nature of the effects and the low number of qualifying bird records in the wider area, it is concluded that the English Onshore Scheme will not result in LSEs on the Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar regarding loss of FLL. This impact pathway is screened out from Appropriate Assessment.

## 5.3.2 Loss of Functionally Linked Land (Permanent)

### 5.3.2.1 Humber Estuary SPA / Ramsar & Lower Derwent Valley SPA / Ramsar

The English Onshore Scheme will require the installation of a converter station in an 8.5 ha agricultural field to the east of the existing Drax Power Station. This will involve the conversion of potential foraging habitat into the proposed converter station, including a series of large buildings, resulting in the permanent loss of the field from the overall foraging resource inventory of SPA / Ramsar birds<sup>12</sup>. Based on its habitat and size, the site of the proposed converter station comprises potentially suitable habitat to support significant numbers of SPA / Ramsar qualifying species, specifically Bewick's swan, golden plover and whooper swan. However, breeding and wintering bird surveys undertaken at the location of the proposed converter site<sup>13</sup> did not document any species for which the Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar is designated. The report states that '*land within and immediately adjacent to the proposed converter station site are used by very small numbers and a limited suite of bird species during the respective breeding and non-breeding (wintering) periods.*'

As highlighted in the preceding section, the limited loss of potential foraging habitat should also be put into context of the ubiquity of farmland in the wider area surrounding the English Onshore Scheme. It is considered that this loss would not have significant impacts at the population level of SPA / Ramsar birds, particularly considering that large tracts of arable land are available much closer to the SPAs / Ramsars. Overall, given the small area impacted and the limited suite of birds documented in surveys, the available evidence supports a conclusion of no LSEs on the Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar regarding the permanent loss of functionally linked habitat. This impact pathway is screened out from Appropriate Assessment.

## 5.3.3 Visual and Noise Disturbance

### 5.3.3.1 Humber Estuary SPA / Ramsar & Lower Derwent Valley SPA / Ramsar

A study on recreational disturbance in the Humber<sup>14</sup> assesses different types of noise disturbance on waterfowl referring to studies relating to aircraft<sup>15</sup>, traffic<sup>16</sup>, dogs<sup>17 18</sup> and machinery<sup>19 20</sup>. These studies identified that there is still relatively little work on the effects of different types of water-based craft and the impacts from jet skis, kite surfers, windsurfers etc. (see Kirby et al. 1993<sup>21</sup> for a review). Some types of disturbance are clearly likely to invoke different responses. In very general terms, both distance from

<sup>12</sup> It is to be noted that this impact is permanent and will extend into the operational phase of the English Onshore Scheme. However, it is discussed here because the habitat loss will first arise during construction.

<sup>13</sup> Bird data from two survey seasons were available for the Drax converter station (January – March 2021 and October – December 2021), while one wintering period was covered at the landfall (October 2020 – March 2021).

<sup>14</sup> Fearnley H., Liley D., & Cruickshanks K. (2012). *Results of the recreational visitor surveys across the Humber Estuary*. Unpublished Footprint Ecology report.

<sup>15</sup> Drewitt. (1999). Disturbance effects of aircraft on birds. English Nature, Peterborough.

<sup>16</sup> Reijnen R., Foppen R. & Veenhass G. (1997). Disturbance by traffic of breeding birds: evaluation of the effect and considerations in planning and managing road corridors. *Biodiversity and Conservation* 6: 567-581.

<sup>17</sup> Lord A., Waas J. R. & Innes J. (1997). Effects of human activity on the behaviour of norther New Zealand dotterel Charadrius obscurus aquilonius chicks. *Biological Conservation* 82: 15-20.

<sup>18</sup> Banks P. B. & Bryant J. V. (2007). Four-legged friend or foe? Dog-walking displaces native birds from natural areas. *Biological Letters* 3: 611-613.

<sup>19</sup> Delaney D. K., Grubb T. G., Reiser H., Bejer P. & Pater, L. L. (1999). Effects of helicopter noise on Mexican spotted owls. *The Journal of Wildlife Management* 63: 60-76.

<sup>20</sup> Tempel D. J. & Gutierrez R.J. (2003). Fecal corticosterone levels in California spotted owls exposed to low-intensity chainsaw sound. *Wildlife Society Bulletin* 31: 698-702.

<sup>21</sup> Kirby J. S., Clee C. & Seager V. (1993). Impact and extent of recreational disturbance to water roosts on the Dee estuary: some preliminary results. *Water Study Group Bulletin* 68: 53-58.

the source of disturbance and the scale of the disturbance (noise level, group size) will influence the response<sup>22 23</sup>. On UK estuaries and coastal sites, a review of WeBS data showed that, among the volunteer WeBS surveyors, driving of motor vehicles and shooting were the two activities most perceived to cause disturbance<sup>24</sup>.

The Waterbird Disturbance Mitigation Toolkit published by the Institute of Estuarine & Coastal Studies in 2013, summarises the key evidence base relating to the noise disturbance impact pathway<sup>25</sup>. Based on the observed responses of waterbirds to noise stimuli, an acceptable receptor dose (i.e. maximum noise level at the bird) of 'below 70 decibels (dB)' has been identified in discussion with Natural England on schemes in the north-east of England. On other projects, including some around the Humber Estuary, the change in the noise levels experienced by birds, rather than an absolute noise threshold, is used as an alternative means of impact assessment. There are no formal guidelines for a change threshold (compared to the measured baseline) that is disturbing to waterfowl and waders, and seabirds but they are known to have hearing comparable to humans. For humans a change of 3 dB defines the threshold for a change in noise to be perceptible. However, there is a significant difference between a change being perceptible and it being disturbing thus causing displacement or otherwise disrupting activity. A change of 10 dB at the receptor is a doubling in perceived loudness and it is reasonable to assume that an increase of more than 10 dB would run a high risk of causing adverse impacts to bird behaviour such as flushing, for the duration of exposure, while a change of 5 dB or less is unlikely to elicit a reaction.

The Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar are designated for a suite of birds of prey, waterfowl and waders, which will be associated with varying degrees of sensitivity to visual and noise disturbance. **Appendix 13C: Construction Noise Modelling** of the ES provides noise modelling data associated with different construction activities, based on the plant / equipment utilised in the respective construction phases. Overall, it is anticipated that the trench excavation period is to last approx. 42 months, with the potential for different sections of the cable route being worked on simultaneously. The amount of noise generated along the working area will depend on the construction activities being undertaken, but associated noise levels are predicted to remain comparatively low.

The following construction activities are likely to be most important regarding noise disturbance due to long stretches of foraging habitat affected and / or particularly noisy techniques being used:

- Trench excavation and cable installation to be undertaken along the entire English Onshore Scheme (use of concrete breaker, 120 dBA at source; dump truck, 114 dBA at source – the noise peaks are likely to be intermittent, with lower noise being emitted when engines are idling).
- Construction of the proposed converter station (hydraulic hammer rig for concrete piling, 117 dBA at source).

The use of a hydraulic hammer rig would be a continuous sound while the concrete breaker would only operate for short periods where concrete is present (unlikely in fields suitable for SPA / Ramsar birds). The noise contour plots included in Appendix 13C of the ES demonstrate that, in most locations, the daytime noise levels emanating from the cable installation works will reduce to 69 dBA (a level of noise that is assumed not to result in disturbance) within 100 m from the planning application boundary. This highlights that only a very narrow stretch of arable fields would be impacted by potentially disturbing noise (i.e. 70 dBA and above).

Noise levels have also been modelled at 74 receptor locations, some of which lie in / or adjacent to arable fields in close proximity to the planning application boundary. The bird disturbance threshold level is not exceeded under Scenario 2 (trenching) or Scenario 3 (cable installation) at any of these receptor locations.

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<sup>22</sup> Delaney D. K., Grubb T. G., Reiser H., Bejer P. & Pater L. L. (1999). Effects of helicopter noise on Mexican spotted owls. *The Journal of Wildlife Management* **63**: 60-76.

<sup>23</sup> Beale C. M. & Monaghan, P. (2005). Modelling the effects of limiting the number of visitors on failure rates of seabird nests. *Conservation Biology* **19**: 2015-2019.

<sup>24</sup> Robinson J. A. & Pollit M. S. (2002). Sources and extent of human disturbance to waterbirds in the UK: An analysis of Wetland Bird Survey data 1995/96 to 1998/99: Less than 32% of counters record disturbance at their site with differences in cause between coastal and inland sites. *Bird Study* **49**: 205.

<sup>25</sup> The University's research is available at the following link: <http://bailey.persona-pi.com/Public-Inquiries/M4%20-%20Revised/11.3.67.pdf>.

Data presented in the Waterbird Mitigation Toolkit<sup>26</sup> indicates that a noise level of 55 dB is likely to be masked by background noise and is considered non-disturbing to waterbirds. This is a highly precautionary metric and is considered here for completeness. To appraise the potential worst-case area of impact, it is useful to establish at what distance from the planning application boundary this noise level would be attained. Tracked excavators and dumpers are the plant that will be most frequently used in trench excavations, both with a sound power level of 105 dBA at source. Assuming the standard distance decay rates for noise (6 dB for every doubling of distance from source), it is predicted that noise levels from the construction works would fall to 55 dB by approx. 340 m from any excavation works. Accordingly, as a worst-case, the potential noise impact distance could extend outward for 340 m from either side of the planning application boundary. Moreover, being active farmland, these fields are frequently traversed in the normal course of events by mechanised plant for ploughing, sowing, fertilising and harvesting. It can therefore be assumed that birds that due use these fields will be habituated to the presence and noise of mechanised plant and any such plant will be localised to parts of fields leaving the remainder of the field untouched. There will be no percussive works (e.g. impact piling) along the cable route, which is relevant as a percussive element to noise such as a hammer hitting a pile is more likely to be disturbing than regular background mechanised noise.

Noise modelling was also undertaken for the construction works required for the proposed converter station, which is likely to encompass piling works (typically regarded as one of the noisiest construction techniques). The contour plot indicates that the bird disturbance threshold of 69 dBA will only be exceeded in a very narrow strip of agricultural land immediately adjoining the construction site. Much of the area that will be subject to these elevated noise levels encompasses treelines, roads and semi-improved grassland, habitats which are unlikely to be used by the aforementioned SPA / Ramsar birds.

This limited noise impact should further be considered in the context of the previous section (loss of functionally linked habitat). There is no evidence that arable fields surrounding the proposed landfall, cable route and converter station support significant assemblages of SPA / Ramsar birds. As a result, they are not regarded as being functionally linked to either SPA / Ramsar. Considering the above evidence, it is concluded that there will be no LSEs of the English Onshore Scheme on the Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar regarding visual and noise disturbance. This impact pathway is screened out from Appropriate Assessment.

## 5.3.4 Water Quality – Dust and Toxic Contaminants

### 5.3.4.1 Humber Estuary SPA / Ramsar / SAC

Various activities associated with construction works can result in negative impacts on water quality in European sites, the most notable being the release of dust and synthetic / non-synthetic toxic pollutants. Dust emission from construction works associated with the English Onshore Scheme poses a particular threat to ecosystems. Dust deposition has the potential to affect plant growth by coating vegetation, blocking stomata and slowing down the chemical reactions involved in photosynthesis. The death of plants attributed to dust emissions may alter the plant community composition and, ultimately, affect the integrity of European sites designated for habitats and / or specific plant species.

Increased sediment input to rivers leads to higher turbidity, which can have a range of knock-on impact in resident ecosystems. For example, high turbidity may reduce plant growth (resulting in a concomitant decrease of dissolved oxygen concentrations), the ability of fish to find food or detect predators and smother freshwater / marine invertebrates that form an important food source for both fish and birds. Notably, both lamprey species require clean gravels for spawning, which may be impacted by sediment that settles on the riverbed.

According to guidance from the Institute of Air Quality Management “*an assessment will normally be required where there is...an ‘ecological receptor’ within: 50m of the boundary of the site; or 50m of the route(s) used by construction vehicles on the public highway...*”. This is based on the view that heavy dust soiling is a threat to vegetation, but only up to a distance of 50 m from dust generating activities even in the absence of mitigation measures (e.g. wetting).

<sup>26</sup> Institute of Estuarine & Coastal Studies, University of Hull. (2013). Waterbird Disturbance Mitigation Toolkit – Informing Estuarine Planning & Construction Projects. 36pp.

The HDD launch pit will be located approx. 80 m from the bank of the River Ouse, which is beyond the 50 m screening distance adopted for dust deposition impacts. Furthermore, the English Onshore Scheme will adopt good practice measures (e.g. dampening of relevant construction materials / plant), which are regarded as embedded mitigation not specifically targeted at the protection of European sites. This screening decision is in agreement with the Environmental Impact Assessment (EIA), which scoped out air quality impacts (including from dust deposition) from further assessment in agreement with the Local Planning Authorities (LPAs).

Construction works can also lead to the release of pollutants in accidental spills within the working area, including fuel, oil and chemicals. Pollutants may also be released from malfunctioning and inadequately maintained construction plant, such as the HDD rig. Contaminants can leach into local watercourses and, due to their long persistence in the environment, reach sensitive ecological receptors many kilometres downstream from construction sites.

The Humber Estuary SPA / Ramsar / SAC lies approx. 5.7 km in flowpath distance from the proposed HDD crossing of the river. While this is a relatively long distance, allowing for attenuation and dilution processes to provide a degree of natural mitigation, potential negative impacts on the SPA / Ramsar / SAC regarding pollutant toxicity cannot be excluded. Furthermore, the entire river corridor will be navigated by river lamprey and sea lamprey travelling from the Humber Estuary to spawning grounds in the River Derwent SAC (see following section).

Overall, due to the sensitivity of the Humber Estuary SPA / Ramsar / SAC to toxic pollutants, LSEs of the English Onshore Scheme on the site cannot be excluded. As a precautionary measure, the SPA / Ramsar is screened in for Appropriate Assessment in relation to this impact pathway.

#### **5.3.4.2 River Derwent SAC & Lower Derwent Valley SPA / Ramsar / SAC**

The Lower Derwent Valley SAC and River Derwent SAC are both sensitive to negative water quality changes as a result of dust and pollutant release from construction works. The sole hydrological link between the English Onshore Scheme and the respective SAC site boundaries is via the River Ouse. However, the water quality within the SAC boundaries will not be directly impacted by the English Onshore Scheme because this lies downstream from the two sites. Notwithstanding this, as discussed in previous sections, both SACs are designated for mobile species that depend on good water quality throughout their entire home ranges. Otters, qualifying species of both SACs, are unlikely to be directly impacted by water chemistry changes, unless major pollution incidents occur. The main pollutants of concern (e.g. polychlorinated biphenyls, pesticides and heavy metals) with regard to direct toxicity to otters are unlikely to be released during construction of the English Onshore Scheme. Instead, the primary negative water quality impacts are likely to occur as indirect effects on the otters' food supply (discussed in the following).

The River Derwent SAC is designated for bullhead, river lamprey and sea lamprey, all of which depend on water quality parameters to remain within naturally occurring limits. Anadromous fish (e.g. river and sea lamprey) will undertake seasonal migrations between the Humber Estuary and the River Derwent via the River Ouse, potentially being affected by water quality pollutants released from the English Onshore Scheme. Dust emission poses a particular threat to aquatic ecosystems because it can increase the sediment load in suspension, leading to higher turbidity in waterways. This can have various knock-on impacts in resident ecosystems, such as changing plant community composition (through reduced photosynthesis) and reducing the ability of fish, which are typically visual predators, to forage successfully. Furthermore, many fish spawn in clean gravels, which may be impacted by excessive sediment deposits. However, LSEs of dust deposition impacts are screened out because the working area lies over 50 m from the River Ouse and the good practice measures (e.g. dampening) that are embedded in the English Onshore Scheme. As was discussed in relation to the Humber Estuary SAC, the qualifying fish of the River Derwent SAC are sensitive to toxic pollutants accidentally leaching from the working area of the English Onshore Scheme.

Overall, LSEs of the English Onshore Scheme on the Lower Derwent Valley SAC and River Derwent SAC regarding toxic pollutants cannot be excluded. Both sites are screened in for Appropriate Assessment in relation to this impact pathway.



## 5.3.5 Disruption of Species Mobility

### 5.3.5.1 Lower Derwent Valley SAC & River Derwent SAC

Many animal species have large home ranges and depend on foraging habitats, breeding areas and resting places beyond designated site boundaries. Maintaining this mobility across vast stretches of habitats is essential for successful breeding, maintaining overall population health and, ultimately, achieving the Conservation Objectives of European sites.

For example, otters (qualifying species of both the Lower Derwent Valley SAC and River Derwent SAC) have vast home ranges, often travelling many kilometres within rivers and along their associated banks and, occasionally, to habitats further away from watercourses. Different types of brownfield development (e.g. roads, bridges, and prolonged construction works) can sever territorial ranges of males (which are typically considerably larger than those of females), resulting in increased competition within sub-populations and interrupting the natural continuum of meta-populations. Inappropriately designed development may represent a significant obstacle to otters travelling alongside a watercourse. The Supplementary Advice on Conservation Objectives for the River Derwent SAC highlights the importance of otter mobility beyond designated site boundaries. For example, it highlights that otters are likely to depend on breeding and resting places within wider territories, using many holts at the same time. It also states that otters are '*dependent on the integrity of sections of river channel, riparian areas, freshwater still-waters, floodplains and transitional and marine waters that lie outside of the site boundary.*' Consequently, being mobile across large spatial scales will be essential to the population health of otters. The English Onshore Scheme will cross a range of habitats that are likely to be used by otters from the Lower Derwent Valley SAC and River Derwent SAC, including the River Ouse (which will be traversed by HDD, such that the hydromorphology of the river will not be affected), and various smaller streams and dykes. Therefore, a potential pathway of impact exists between the English Onshore Scheme and SAC otters. A guidance note published on the CIEEM website on otters and development<sup>27</sup> summarises key features to consider regarding otter safety:

- Otter habitats should not be permanently severed;
- Avoidance of river realignment for construction processes;
- Minimisation of hardened margins;
- Adequacy of otter fencing and other mitigation measures must be checked by an expert prior to road opening; and
- 6-monthly checks and repair (where necessary) of fencing.

Mobility beyond designated site boundaries is also essential for anadromous fish (a designated feature of River Derwent SAC only, not the Lower Derwent Valley SAC), which spawn in freshwater habitats and complete parts of their life cycle at sea. Most of these fish return to the same breeding areas each year, implying that the hydrological continuity of riverine habitat from the sea to upstream spawning locations is extremely important. The River Derwent SAC is designated for two anadromous species, including the river lamprey and sea lamprey. The latter species in particular is relatively poor at overcoming migratory obstacles and can easily be restricted to the lower reaches of waterbodies. A report on the ecology of river, brook and sea lampreys<sup>28</sup> highlights barriers and in-channel works as major threats to both species, affecting natural migratory behaviour and reshaping the distribution of populations along the river continuum. The River Derwent is a tributary of the River Ouse, which in turn flows into the Humber Estuary, thus providing linkage to the marine environment.

However, **Chapter 3: Description of the English Onshore Scheme** of the ES confirms that the River Ouse (HDD reference HDD\_041) will be traversed by HDD. This technique uses a drill that creates subterranean channels for the HVDC cables below the riverbed, thus avoiding in-channel open-cut trenching works. Given that there is no pathway of impact, it is concluded that there will be no LSEs of the English Onshore Scheme on the River Derwent SAC regarding the disruption of anadromous fish mobility. This impact pathway is screened out from Appropriate Assessment in relation to river lamprey

<sup>27</sup> Northern Ireland Environment Agency. (2011). Otters & Development. 36pp. <https://cieem.net/wp-content/uploads/2019/07/natural-information-otters-and-development-2011.pdf> [Accessed on the 19/10/2021]

<sup>28</sup> Maitland P.S. (2003). *Ecology of the River, Brook and Sea Lamprey*. Conserving Natura 2000 Rivers Ecology Series No.5. English Nature, Peterborough.

and sea lamprey in the River Derwent SAC but is discussed in the Appropriate Assessment in relation to otter in the River Derwent SAC and Lower Derwent Valley SAC.

## 5.3.6 Atmospheric Pollution (Via Nitrogen Deposition)

### 5.3.6.1 Humber Estuary SPA / Ramsar / SAC & Lower Derwent Valley SAC

Construction activities may involve a range of construction traffic types, including light good vehicles (LGVs), heavy goods vehicles (HGVs) and Abnormal Indivisible Loads (AILs). All these vehicles use internal combustion engines that release pollutants into the atmosphere, including NO<sub>x</sub> and nitrogen. Many European sites (including the Humber Estuary SPA / Ramsar / SAC and Lower Derwent Valley SAC) are associated with NO<sub>x</sub> toxicity and nitrogen deposition thresholds. Exceedances of the Critical Level for NO<sub>x</sub> and / or nitrogen Critical Load (CL) may damage individual plants, as well as changing overall community composition. However, it is widely accepted that the contribution of atmospheric pollutants is negligible beyond 200 m from the edge of roads<sup>29</sup>. None of the European sites discussed in this HRA lie within this screening distance from the English Onshore Scheme or its associated Affected Road Network (ARN). Therefore, LSEs of the English Onshore Scheme on the Humber Estuary SPA / Ramsar / SAC and Lower Derwent Valley SAC regarding atmospheric pollution in the construction period can be excluded. These sites are screened out from Appropriate Assessment in relation to this impact pathway.

## 5.4 Operational Period

Most direct and indirect impacts on qualifying habitats and species of European sites are restricted to the construction period and will not be relevant to operation of the English Onshore Scheme. The operational period has been scoped out of this HRA.

### 5.4.1 Water Quality

#### 5.4.1.1 River Derwent SAC, Lower Derwent Valley SPA / Ramsar / SAC & Humber Estuary SPA / Ramsar / SAC

The proposed converter station adjacent to the existing Drax substation is the only permanent area of hardstanding associated with the English Onshore Scheme. Impermeable urban surfaces, such as that present in the converter station, will result in increased volumes of surface runoff compared to a no-development scenario, with the potential to affect the water quality in local watercourses through increased sedimentation and input of toxic pollutants. As discussed in the previous section (Construction Period), the qualifying features of the River Derwent SAC, Lower Derwent Valley SPA / Ramsar / SAC and Humber Estuary SPA / Ramsar / SAC are sensitive to a decline in water quality for varying reasons (for further detail on this please refer to earlier sections in this HRA).

Surface runoff from the proposed converter station may contain a combination of fine sediments and toxic contaminants (e.g. oils and fuels from spillages and leaks), with the potential to affect both fauna and flora in European sites. Back Lane Drain is the only waterbody potentially receiving discharge from the site, which has been identified in **Chapter 11: Hydrology and Land Drainage** of the ES as having 'medium sensitivity' to water pollution. The hardstanding on which the proposed converter station will be constructed will be a maximum of 5 ha in size, and thus the volume of surface runoff is likely to be limited. Furthermore, it is noted that attenuation ponds will be located immediately east and west of the proposed converter station, which will reduce surface flow to greenfield runoff rates. The extended residence time of water in the pond will allow for natural attenuation processes to minimise the volume of pollutants that reach surface waterbodies (e.g. through the settling of sediment to the base of the pond). Such mitigation measures are incorporated in the English Onshore Scheme to conform to legal requirements, which render it illegal to pollute the water environment (see earlier section on water quality in the construction period), and as such can be taken into account at the screening stage of HRAs.

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<sup>29</sup> Natural England. (June 2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. Natural England Report. 43pp.

Therefore, it is concluded that the English Onshore Scheme will not result in LSEs on the River Derwent SAC, Lower Derwent Valley SPA / Ramsar / SAC and Humber Estuary SPA / Ramsar / SAC regarding water quality in the operational period. These European sites are screened out from Appropriate Assessment in relation to this impact pathway.

## 5.5 Decommissioning Period

Potential impacts during decommissioning of the English Onshore Scheme would be similar or lower in magnitude to the ones identified for the construction period; for example, structures that have been installed underground or beneath watercourses would be likely to be cut off and capped rather than dug up during any decommissioning. As such, all pathways are adequately covered and assessed in section 5.3 of this HRA. Furthermore, **Chapter 3: Description of the English Onshore Scheme** of the ES indicates that the 40-year operational lifespan of the English Onshore Scheme will be extended through refurbishment and plant replacement. The worst case scenario for decommissioning is the removal of the cables, where likely impacts are predicted to be no greater than the construction phase as assessed above. No further appraisal of the decommissioning period is undertaken in this HRA.

## 5.6 Summary

Overall, HRA Stage 1 – Screening for LSEs indicates that the following two impact pathways will be assessed further in HRA Stage 2 – Appropriate Assessment:

- Water quality – in relation to the Lower Derwent Valley SAC, River Derwent SAC and Humber Estuary SPA / Ramsar / SAC
- Disruption of species mobility – in relation to the Lower Derwent Valley SAC and River Derwent SAC

Due to their proximity to qualifying habitats / species, Route Sections 3 and 4, covering both the authorities of East Riding of Yorkshire and Selby, are the elements of the English Onshore Scheme resulting in LSEs.

## 6. Appropriate Assessment

### 6.1 Construction Period

#### 6.1.1 Water Quality

##### 6.1.1.1 Lower Derwent Valley SAC, River Derwent SAC & Humber Estuary SPA / Ramsar / SAC

Construction of the English Onshore Scheme may result in the leakage of synthetic / non-synthetic toxic pollutants to the environment. These substances can be mobilised into waterbodies via rainfall and surface runoff, potentially reaching European sites that rely on good water quality. Route Sections 3 and 4, due to their proximity to the River Ouse, are most likely to result in water quality impacts that are relevant to qualifying fish species. All Route Sections have the potential to result in water quality impacts of relevance to otters, which likely use any of the waterbodies in the ZoI of the English Onshore Scheme.

**Chapter 18: Outline Construction Environmental Management Plan** of the ES discusses the mitigation measures that will be adopted during the construction of the English Onshore Scheme, aimed at minimising potential impacts on the environment. Regarding pollution from toxic substances, the outline Construction Environmental Management Plan (CEMP) details the following mitigation measures that will help prevent negative water quality impacts:

#### **Storage of aquatic pollutants**

- On-site storage of fuels, oils and chemical will be avoided where possible, but where required, storage will be at least 10 m from watercourses and 50 m from boreholes / wells;
- Suitable areas for on-site storage will be identified during the site establishment process, taking into account factors such as ground conditions, proximity to environmental receptors and ease of access;
- Storage areas will be adequately designed, including an impermeable base, appropriate anti-spill measures, secure access and being sited away from vehicle movements; and
- Potentially harmful substances must be stored in bunded or secondary containment facilities, which provide sufficient volume for 110 % of the storage capacity, are impermeable to water / oil, and house all valves / filters / vent pipes / taps in secondary containment (such that escaping materials are retained).

#### **Operation and refuelling of plant / equipment**

- All plant and equipment must be located and used on hardstanding, unless essential works in a watercourse are undertaken;
- Refuelling should primarily be limited to compound areas (which are supported by adequate drainage systems) rather within works areas;
- Refuelling will take on impermeable surfaces for large plant and over plant nappies / drip trays for small plant;
- A Spill Response Plan will be adopted for the English Onshore Scheme, which includes the provision of adequate spill kits, suitable spill response training to site staff and details the response to be followed in a spill emergency (e.g. stopping pollutant flow using absorbent material and safe disposal of contaminated spoil).

#### **Pre-construction / construction drainage & wastewater treatment**

The CEMP specifically aims at reducing the potential for erosion and runoff of sediment in suspension through the following measures:

- Prevention of entry and exit of surface runoff to / from the working area, as well as preventing clean catchment flows from entering, through the installation of a pre-construction drainage system;
- Avoidance of areas prone to erosion or flooding when siting access roads, planning earthworks and stockpiling spoil;
- Location of stockpiles as far away from watercourses, ditches and drains, as well as using silt fences around their base;
- Installation of sediment collection devices and erosion control works along existing roadside and field drains;
- Potential site effluent to be retained on site within an intermediate bulk container (IBC) or holding tank; no discharge of non-foul site wastewater to groundwater or surface water;
- Wash-down / refuelling of vehicles / plant in designated areas (e.g. comprising impermeable base, secondary containment, etc.);
- Use of specialist wastewater contractor to dispose of hazardous liquid wastes that arise on site.

Aside from the water quality protection measures included in the outline CEMP, there is also a legal framework that safeguards adequate water quality in the environment, which will also help maintain the integrity of European sites. For example, it is illegal to pollute water courses (whether or not they are designated as European sites) under the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and Environmental Permitting (England and Wales) Regulations 2016. This would include pathways via suspended sediment (e.g. dust or soil), as well as runoff and leakage of synthetic / non-synthetic toxic pollutants from hardstanding into surface waterbodies and the groundwater environment.

Overall, it is considered that the English Onshore Scheme is supported by an adequate CEMP, which encompasses all essential measures to preserve water quality. In combination with the protective legal framework that makes it illegal to pollute the water environment, **it is concluded that the English Onshore Scheme will not result in adverse effects on the integrity of the Lower Derwent Valley SAC, River Derwent SAC and Humber Estuary SPA / Ramsar / SAC regarding water quality.** No additional recommendations for mitigation are made or required in this HRA.

## 6.1.2 Disruption of Species Mobility

### 6.1.2.1 Lower Derwent Valley SAC & River Derwent SAC

AECOM undertook otter surveys across the length of the English Onshore Scheme between Fraithorpe (East Riding of Yorkshire) and Drax (North Yorkshire). These are reported in **Appendix 7C: Water Vole and Otter Survey Report** of the ES. The survey area included all watercourses that traverse the English Onshore Scheme, up to a distance of 250 m from the planning application boundary (access permitting). Regarding the HRA, Route Sections 3 and 4 are sections closest to the Lower Derwent Valley SAC and River Derwent SAC, and the riparian habitats located within these areas are considered potentially the most important in supporting the ecological integrity of otter populations. Surveyors looked for signs of presence of otters (e.g. spraints, anal jelly and remains of prey), as well as evaluating the general suitability of riparian habitats (e.g. presence of vegetation, holts, couches, etc). Figure 2 (Otter Habitat Assessment & Survey) in Appendix 7C highlights that none of the watercourses surveyed in route sections 3 and 4 had confirmed otter presence. However, several watercourses, most notably the River Ouse, were identified as 'otter potentially present', based on a general suitability of the river channel and bankside habitats. The River Ouse and wider associated tidal mudflats is known to be a habitat link between the River Derwent SAC and the Humber Estuary, likely to be routinely used by transient and foraging otters. The closest waterbody with confirmed otter presence was the River Foulness, approx. 8.5 km to the east of the Lower Derwent Valley SAC. Importantly, no presence of holt features or habitat features potentially suitable for holt creation was noted within the planning application boundary.

A range of mitigation measures, detailed in **Chapter 7: Ecology and Nature Conservation** of the ES will be deployed to minimise effects on the natural ranging behaviour of otters. These are tailored to allow for the continued use of riverside habitats during the construction phase of the English Onshore

Scheme. Night-time working will be restricted to avoid disturbance to otters moving through their territories and maintain barrier-free movement, particularly in proximity to established otter habitats. Where night-time working is required at crossings using HDD, the works areas (i.e. the HDD launch point) will be located more than 7 m from riverbanks, providing continued permeability for ranging otters. If night-time lighting is required, this will be directed away from the riverbank and known otter habitat, while a visual screen will be positioned along the riverward side of working areas to shield otter commuter routes. While no active holts or suitable holt locations were identified during the surveys, pre-construction otter surveys will be undertaken to inform detailed design and confirm the absence of holt / potential holt sites ahead of the commencement of works. Working areas along riverbanks will be fenced off to minimise impacts on adjoining sections of banks.

**Overall, given the mitigation measures that are to be adopted, it is concluded that adverse effects of the English Onshore Scheme on the Lower Derwent Valley SAC and River Derwent SAC regarding disruption of otter mobility can be excluded.** No additional recommendations for mitigation are made or required in this HRA.

## 6.2 Summary

On the basis of the HRA Stage 2 – Appropriate Assessment, it is concluded that adverse effects of the English Onshore Scheme (with regard to all Route Sections) on the integrity of the Lower Derwent Valley SPA / Ramsar, River Derwent SAC and Humber Estuary SPA / Ramsar / SAC can be excluded. Therefore, planning permission for the English Onshore Scheme can be granted without proceeding to HRA Stage 3 – Assessment of Alternatives. This applies to the elements of the Scheme in both East Riding of Yorkshire and Selby.

## 7. In-combination Effects

### 7.1 Introduction

The HRA process requires potential effects to be discussed in-combination with other plans and projects. This is to account for cumulative impacts of development plans, where the individual effects of a proposal are screened out due to there being an insufficient magnitude of impact. Ultimately, this approach allows the identification of individually small, but cumulatively material effects with the potential to cause LSEs or adverse effects.

### 7.2 Discussion

#### 7.2.1 Interactions with the Marine Scheme (MS)

As highlighted in the introduction, the Project also comprises a Scottish Onshore Scheme and a Marine Scheme. While the long distance between the English Onshore Scheme and Scottish Onshore Scheme means that there is no potential for interactions (and thus the Scottish Onshore Scheme is not considered here), the Marine Scheme adjoins the English Onshore Scheme at the landfall at Fraisthorpe, East Riding of Yorkshire. **Table 3** below summarises the key impact pathways associated with the construction and operation of the Marine Scheme, noting that these effects are spatially segregated from the European sites discussed in this HRA.

Notwithstanding this, there is little potential for interaction between the English Onshore Scheme and the Marine Scheme. All marine European sites in the ZoI of the English Onshore Scheme (the Flamborough Head SAC, Flamborough and Filey Coast SPA and Greater Wash SPA) have been screened out in this HRA due to there being no potential pathway of impact to the English Onshore Scheme. Therefore, in-combination effects with the Marine Scheme will not arise.

**Table 3. Likely impact pathways associated with the construction and operation of the Marine Scheme.**

Stage of Development	Impact Pathways	Details	Zone of Influence (ZoI)
Installation period	Disturbance and habitat loss	There will be direct temporary habitat loss along the approx. 435 km of subsea cable burial, although this effect will not occur along the entire stretch of the cable route simultaneously.	Cable laying works footprint only
	Sound and visual disturbance to qualifying birds, marine mammals and fish	Regardless of the installation method used, visual (from vessels) and sound (airborne and underwater) disturbance may occur within designated sites and functionally linked areas. Noise from subsea cable installations is significantly lower than from other anthropogenic sources (wind farm installations, sonar, impact piling, UXO detonations).	Potentially 1km from the Marine Working Area, or up to 50 km for marine mammals (JNCC advice)
	Sediment disturbance	Depending on the nature of the seafloor, sediment reworking through ploughing, jetting or cutting-wheels can lead to turbid plumes of several hectares, which persist between several hours to days. While this effect may impede predators that hunt visually (e.g. seabirds and marine mammals), such effects are likely to be localised and transient. It is considered that fine silts and sands will settle to the seabed	Potentially between 1-2 km from the Marine Working Area

Stage of Development	Impact Pathways	Details	Zone of Influence (Zol)
		within approx. 1.54 km from the point of mobilization (and 1.45 km from source when accounting for dispersion processes).	
	Water quality	During construction there is a risk of resuspension of buried contaminants (e.g. heavy metals, hydrocarbons) into the surrounding water column. Furthermore, there is a potential for ships and hydraulic equipment to result in accidental oil leakages / spillages during cable laying.	Several hectares surrounding the Marine Working Area
Operation	Electromagnetic field (EMF) impacts	EMF effects are of potential concern regarding certain species of fish and marine mammals. For example, magnetic fields have been observed to reduce swimming speed in European eel <i>Anguilla anguilla</i> in some circumstances.	From sheath of the cable to a distance of approx. 35 m horizontally / vertically
	Cable heat emissions	Operation of subsea HVDC cables generates heat due to resistance in the conductor components, which can warm surrounding sediments and water molecules. Heat dissipation modelling indicates that heat increase is limited to approx. 3C within 50 cm of the seabed surface.	Approx. 50 cm from seabed surface (based on cables being buried at 1.5 m depth)
	Maintenance and cable repair	Same or reduced effects compared to the above construction and operational effects.	NA
Decommissioning	Various	Same or reduced effects compared to the installation and operational periods.	NA

## 7.2.2 Other Plans and Projects Effects

**Table 4** below provides a summary of the plans and projects that have been considered in the in-combination assessment, detailing plan / project name, geographic proximity to the most relevant European site and a verdict on the potential for interaction with the English Onshore Scheme. Overall, in-combination effects with any of the schemes listed are excluded, given that all projects will need to be supported by bespoke HRAs. These will have to demonstrate no adverse effects on site integrity, including regarding in-combination effects. Given that not all of these schemes have been fully designed (e.g. the Humber Low Carbon Pipelines) and / or HRAs haven't been completed (e.g. Selby Local Plan HRA), in-combination impacts cannot be fully assessed. It is the responsibility of these emerging plans to assess in-combination effects with the English Onshore Scheme as they progress towards planning application.

In addition to the Schemes in **Table 4** below, there is also SEGL1, which is a companion Scheme to SEGL2. SEGL1 will consist of

- **Scottish Onshore Scheme:** A converter station located west of Thurston Manor and substation at Branxton in East Lothian, Scotland with approximately 7.5 km of buried HVDC cable to a landfall south east of Thorntonloch beach. The converter station and substation will be connected by approximately 5 km of High Voltage Alternating Current (HVAC) cable. The substation connects the Project to the existing transmission system HVAC cable;
- **Marine Scheme:** Approximately 176 km of subsea HVDC cable from Thorntonloch Beach, Torness in East Lothian, to Seaham, County Durham of which 37.5 km is in Scottish waters and 138.5 km is in English waters; and



- **English Onshore Scheme:** Approximately 10 km of underground HVDC cable from the landfall north of Seaham, west along the Sunderland / County Durham boundary and then south west through County Durham, to a converter station at Hawthorn Pit. The converter station will be connected to a new 400 kV substation by approximately 1 km of HVAC cable. The new 400 kV substation will connect the project to the existing 275 kV Hawthorn Pit substation and the existing electricity transmission system.

It will be subject to its own separate HRA process which, for the English Onshore SEGL1 Scheme, will be undertaken by Durham County Council as competent authority. Although a twin scheme to SEGL2 the English Onshore Schemes are geographically entirely separate with the SEGL1 English Onshore Scheme being located in County Durham approximately 113km north of the English Onshore Scheme of SEGL2. The HRA for the SEGL1 English Onshore Scheme considers impacts on Northumbria Coast SPA/Ramsar site and Durham Coast SAC. The HRA concludes that there will be no adverse effect on integrity of any European sites either alone or in combination with other plans or projects.

Due to the geographical separation between SEGL1 and SEGL2 there is no potential for SEGL1 and the English Onshore Scheme of SEGL2 to affect the same European sites and therefore no potential for in combination effects.

**Table 4: List of plans and projects that have been appraised as part of the in-combination assessment, including location in relation to the nearest European site (also affected by the English Onshore Scheme) and a potential for interaction.**

Project Name	Proposal	Location to nearest European site affected by the English Onshore Scheme (approx. km)	Potential for Interaction
Hornsea Four	The fourth of a series of offshore wind farms off the Yorkshire coastline (Hornsea One, Two and Three being operational, under construction or having received DCO consent respectively), comprising approx. 492 km <sup>2</sup> and up to 180 wind turbines. An export cable associated with the project will make landfall approx. 2 km south of the English Onshore Scheme.	65 km from the Yorkshire coastline and further from the Humber Estuary SPA / Ramsar, the nearest European site associated with the English Onshore Scheme.	This project is likely to primarily impact upon marine habitats / species, which the English Onshore Scheme would not affect. Furthermore, no in-combination effects are expected due to the long distance from European sites in the ZoI of the English Onshore Scheme.  <b>Overall, no in combination LSEs are expected.</b>
Drax Bioenergy with Carbon Capture & Storage (CCS)	Plan to deploy bioenergy-related CCS on its energy generating units by 2030. It is estimated that 8 million tonnes of CO <sub>2</sub> will be permanently stored on-site each year. Few details on this scheme are available.	The Drax energy plant is located directly adjacent to the proposed Converter Station of the English Onshore Scheme, with similar distances to the European sites identified in this HRA.	While the CCS plant is proposed within the existing Drax Power Station footprint, immediately east of the English Onshore Scheme, no cumulative impacts are likely to occur. For example, the area surrounding the proposed converter station does not constitute functionally linked land.  <b>Overall, no in combination LSEs are expected.</b>
Humber Low Carbon Pipelines	Proposals to create an onshore network of underground pipelines in the Humber region, with pipelines transporting carbon dioxide and hydrogen respectively.	The pipeline corridor will connect to various power stations (including Drax) and will cross the Humber through a tunnel.	There are potential cumulative impacts with the English Onshore Scheme regarding water quality, as well as otter mobility. However, while detailed proposals for this scheme are not available, it is unlikely that this project and the English Onshore Scheme will occur simultaneously in the same locations.  Furthermore, the impacts of the English Onshore Scheme will predominantly be temporary and the English Onshore Scheme already includes sufficient mitigation to address its contribution to any effect. The HRA of the Humber Low Carbon Pipelines will need to demonstrate that adequate mitigation regarding water quality and otter mobility are delivered.

Project Name	Proposal	Location to nearest European site affected by the English Onshore Scheme (approx. km)	Potential for Interaction
<b>Given this, no in combination LSEs are expected.</b>			
East Riding Local Plan 2012 – 2029	This is the long-term development strategy for the East Riding of Yorkshire, which includes the provision of at least 23,800 new dwellings and 235 ha of employment land.	The Local Planning Authority encompasses large sections of the English Onshore Scheme, including the Humber Estuary SPA / Ramsar / SAC and the eastern sections of the Lower Derwent Valley SAC and River Derwent SAC.	<p>Housing and employment development may be delivered in close proximity to the proposed English Onshore Scheme trajectory, with in-combination impact potential in relation to water quality, otter mobility and loss of functionally linked habitat.</p> <p>However, the impacts of the English Onshore Scheme will predominantly be temporary and it already includes sufficient mitigation to address its contribution to any effect. The HRA of the Plan will need to demonstrate that adequate mitigation measures for these impact pathways are delivered.</p>
<b>Therefore, no in combination LSEs are expected.</b>			
Selby Local Plan 2020 – 2040	This is the long-term development strategy for the District of Selby, which includes the provision of at least 8,040 new dwellings and 110 ha of employment land.	The Local Planning Authority encompasses part of Route Section 3 and the entirety of Route Section 4, including the western sections of the Lower Derwent Valley SAC and River Derwent SAC.	<p>Housing and employment development may be delivered in close proximity to the proposed English Onshore Scheme trajectory and / or converter station, with in-combination impact potential in relation to water quality, otter mobility and loss of functionally linked habitat.</p> <p>However, the impacts of the English Onshore Scheme will predominantly be temporary and it already includes sufficient mitigation to address its contribution to any effect. The HRA of the Plan will need to demonstrate that adequate mitigation measures for these impact pathways are delivered.</p>
<b>Therefore, no in combination LSEs are expected.</b>			
Land Northeast of Eastfield Farm, Stockbridge Lane,	Construction of a solar farm and battery storage facility together with all associated works, equipment and necessary infrastructure.	24 km to the Humber Estuary SPA / Ramsar / SAC	No in-combination likely significant effects expected due to long distance to European sites potentially affected by the English Onshore Scheme.

Project Name	Proposal	Location to nearest European site affected by the English Onshore Scheme (approx. km)	Potential for Interaction
Hutton Cranswick / East Riding of Yorkshire			
Field At Grid Reference, Back Lane, Skerne / East Riding of Yorkshire	Installation and operation of a solar farm with associated infrastructure, including photovoltaic panels, mounting frames, transformers/inverters, substation, access tracks, pole mounted CCTV cameras and fencing.	28 km to the Humber Estuary SPA / Ramsar / SAC	No in-combination likely significant effects expected due to long distance to European sites potentially affected by the English Onshore Scheme.
Land off New Road, Drax / Selby District	Development of an energy storage facility including battery storage containers; substations; power conversion systems; transformers and associated switchgear; HVAC equipment; communications and grid compliance equipment; temporary construction compound; CCTV; fencing; infrared lighting; access, drainage and landscaping works and associated development.	7 km to the Humber Estuary SPA / Ramsar / SAC	No in-combination likely significant effects are expected – this scheme does not traverse waterbodies (such as the River Ouse), and there is thus no potential for water quality impacts in the Humber Estuary, which is also very distant.
Drax Power Station, New Road, Drax / Selby District	Demolition of Flue Gas Desulphurisation (FGD) Plant and associated restoration works	7 km to the Humber Estuary SPA / Ramsar / SAC	No in-combination likely significant effects are expected – this scheme does not traverse waterbodies (such as the River Ouse), and there is thus no potential for water quality impacts in the Humber Estuary, which is also very distant.
Rusholme Grange, Rusholme Lane, Newland / Selby District	Construction of battery energy storage system to provide energy balancing services to the National Grid, including bund and landscaping	3 km to the Humber Estuary SPA / Ramsar / SAC	<p>Rusholm Lane lies immediately adjacent to the River Ouse, with potential for impacts on water quality and species mobility.</p> <p>However, the impacts of the English Onshore Scheme will predominantly be temporary and it already includes sufficient mitigation to address its contribution to any effect.</p> <p>The construction of the BESS will need to ensure that the above impact pathways are adequately addressed.</p>

Project Name	Proposal	Location to nearest European site affected by the English Onshore Scheme (approx. km)	Potential for Interaction
<b>Therefore, no in combination LSEs are expected.</b>			
Newlands Farm, Turnham Lane, Cliffe / Selby District	EIA Screening opinion request for 5 wind turbines	6 km to the River Derwent SAC	No in-combination likely significant effects are expected due to long distance to the River Derwent SAC, the closest European site potentially affected by the English Onshore Scheme.
Land Adjacent to Barlow Common, Barlow Common Road, Barlow / Selby District	EIA Screening opinion for a 50MW battery storage system (BESS) on land off Barlow Common Road	5 km to the River Derwent SAC	No in-combination likely significant effects are expected due to long distance to the River Derwent SAC, the closest European site potentially affected by the English Onshore Scheme.
Drax Power Station, Drax / Selby District	EIA scoping opinion for Barlow Ash Mound, northwest of Drax Power Station. This proposal is for the continued disposal of unsold ash on Barlow Ash Mound.	1 km to the River Derwent SAC	<p>Barlow Ash Mound lies only 1km from the River Derwent SAC and the proposal involves continued disposal of ash, a potential water quality threat, in the site. There may be potential interaction with water quality effects of the English Onshore Scheme on the River Ouse and Humber Estuary.</p> <p>The impacts of the English Onshore Scheme will predominantly be temporary and it already includes sufficient mitigation to address potential water quality effects.</p> <p>The proposal will need to ensure that water quality effects, including in-combination effects, are adequately addressed.</p> <p><b>Given this, no in combination LSEs are expected.</b></p>

## 8. Conclusions

This HRA has assessed potential impacts of the English Onshore Scheme on European sites within a 10 km ZoI, including LSEs and potential adverse effects where relevant. The English Onshore Scheme comprises approximately 69 km of underground HVDC cables from the landfall at Fraisthorpe (East Riding of Yorkshire), across the River Ouse to the proposed converter station at Drax (Selby District), adjacent to the existing Drax Power Station. An initial screening exercise identified the following European sites within the ZoI (noting that the coastal / marine sites marked in bold below were excluded from further assessment, because there are no linking impact pathways to the English Onshore Scheme):

- Humber Estuary SPA / Ramsar;
- Humber Estuary SAC;
- Lower Derwent Valley SPA / Ramsar;
- Lower Derwent Valley SAC;
- River Derwent SAC;
- **Flamborough Head SAC;**
- **Flamborough and Filey Coast SPA;** and
- **Greater Wash SPA.**

The following impact pathways were considered potentially relevant to the sites scoped in for assessment, including loss of functionally linked habitat (both temporary and permanent), visual and noise disturbance (during construction), water quality (during construction), disruption of species mobility (during construction) and atmospheric pollution (during construction). The following paragraphs list the main conclusions regarding LSEs and potential adverse effects on site integrity.

### 8.1 Loss of Functionally Linked Habitat (Temporary and Permanent)

The English Onshore Scheme will inevitably result in the temporary loss of small areas of agricultural land (and small-scale permanent loss in the case of the proposed converter station), some of which may be utilised by SPA / Ramsar birds. Notable, while a small amount of supporting habitat may be temporarily lost, historic bird records for the area around the English Onshore Scheme obtained from different sources provide no indication that the affected farmland parcels are functionally linked to the Humber Estuary SPA / Ramsar or Lower Derwent Valley SPA / Ramsar. Furthermore, large sections of the arable fields adjoining the English Onshore Scheme would be unaffected, allowing for their continued use by SPA / Ramsar birds.

Overall, given the relatively small amount of agricultural land affected (particularly considering the ubiquity of this habitat in the wider Humber region), the temporary nature of the effects and the low documented level of use by SPA / Ramsar birds, it is concluded that the English Onshore Scheme will not result in LSEs on the Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar regarding loss of functionally linked habitat. These sites were screened out from Appropriate Assessment in relation to this impact pathway.

### 8.2 Visual and Noise Disturbance (During Construction)

SPA / Ramsar birds roosting and / or foraging in agricultural fields adjoining the English Onshore Scheme are sensitive to visual and noise disturbance during the construction period. However, noise modelling undertaken for the ES indicates that, in most locations, the daytime noise levels emanating from the cable installation works will reduce to 69 dBA (a level of noise that is unlikely to result in disturbance) within 100 m from the working area. Furthermore, only a narrow section of land, some of

which is considered unsuitable for SPA / Ramsar birds, surrounding the proposed converter station would be subject to noise levels above 69 dBA.

This limited noise impact must further be considered in the context of the impact pathway loss of functionally linked habitat. Based on available bird record data, there is no evidence to indicate that arable fields surrounding the proposed landfall, cable route and converter station support significant assemblages of SPA / Ramsar birds (>1% of qualifying populations). Considering this, it is concluded that there will be no LSEs of the English Onshore Scheme on the Humber Estuary SPA / Ramsar and Lower Derwent Valley SPA / Ramsar regarding visual and noise disturbance. These sites were screened out from Appropriate Assessment in relation to this impact pathway.

### 8.3 Water Quality (During Construction and Operation)

While LSEs regarding dust release in the construction period was screened out from Appropriate Assessment, potential water quality impacts from contamination with toxic pollutants could not be excluded in relation to the Humber Estuary SPA / Ramsar / SAC, River Derwent SAC and Lower Derwent Valley SAC. These sites were screened in for Appropriate Assessment in relation to this impact pathway.

However, **Chapter 18: Outline Construction Environmental Management Plan** of the ES discusses a range of mitigation measures that will be adopted during the construction of the English Onshore Scheme, aimed at minimising potential impacts on the water environment. The CEMP adequately addresses all major source of pollutants, including the storage of aquatic pollutants, operation and refuelling of plant / equipment, construction drainage and management of non-foul wastewater. Furthermore, the HRA discussed the legal requirement for projects to protect the integrity of the water environment and prevent any pollution of surface water and groundwater.

**Therefore, it was concluded that the English Onshore Scheme will not result in adverse effects on the integrity of the Humber Estuary SPA / Ramsar / SAC, River Derwent SAC and Lower Derwent Valley SAC regarding toxic contaminants. No additional recommendations for mitigation were made in this HRA.**

LSEs of the operational phase of the English Onshore Scheme on the water quality in the River Derwent SAC, Lower Derwent Valley SAC and Humber Estuary SPA / Ramsar / SAC were excluded. The volume of surface runoff (and potential pollutants) generated by the proposed converter station (approx. 5 ha in extent) is likely to be limited. Furthermore, an attenuation pond will be situated to the east of the station, which will increase the residence time of surface water and allow for natural attenuation processes (e.g. settling of excess sediment to the base of the pond and uptake of pollutants in plant tissue) to occur. Given that the attenuation pond is designed to conform to legal requirements of protecting the wider water environment (and not specifically to protect SACs), it does not represent mitigation in HRA terms and can be taken into account at the screening stage.

### 8.4 Disruption of Species Mobility (During Construction)

It was considered that the English Onshore Scheme could result in negative impacts on the mobility of qualifying species beyond designated site boundaries, including those of the River Derwent SAC (otter, sea lamprey, river lamprey) and Lower Derwent Valley SAC (otter). However, potential impacts on anadromous fish were screened out from Appropriate Assessment because the River Ouse, the only waterbody of relevance to these fish affected by the English Onshore Scheme, will be traversed by HDD. In contrast, LSEs on the ranging behaviour of otters along riverbanks, a species that is likely to use many waterbodies in the hydrological catchment impacted by the English Onshore Scheme, could not be excluded.

Due to their proximity to the two SACs, Route Sections 3 and 4 are likely to be most important in supporting the integrity of the local otter population. During otter surveys undertaken in support of the ES, the closest waterbody to the Lower Derwent Valley SAC with confirmed otter presence was the River Foulness, approx. 8.5 km to the east of the site. Notwithstanding this, the English Onshore Scheme will traverse numerous rivers, streams and dykes, many of which are likely to comprise habitat of potential value to otters. **Chapter 7: Ecology and Nature Conservation** of the ES establishes that mitigation measures will be deployed to minimise effects on the natural ranging behaviour of otters,

which are tailored to allow for the continued use of riverside habitats during the construction phase of the English Onshore Scheme. These include a range of interventions, such as restrictions on night-time working, allowing for sufficient distances between HDD launch points and riverbanks, directional lighting and visual screens.

**Overall, given that adequate mitigation measures will be put in place, adverse effects of the English Onshore Scheme on the Lower Derwent Valley SAC and River Derwent SAC regarding disruption of otter mobility were excluded.**

## 8.5 Atmospheric Pollution (During Construction)

An initial scoping assessment indicated that several of the European sites within the Zol of the English Onshore Scheme are sensitive to atmospheric nitrogen deposition, including the Lower Derwent Valley SAC and Humber Estuary SPA / Ramsar / SAC. However, it is widely accepted that the contribution of atmospheric pollutants is negligible beyond 200 m from the edge of roads. None of the European sites discussed in this HRA lie within this screening distance from the English Onshore Scheme or its associated Affected Road Network (ARN). Therefore, LSEs of the English Onshore Scheme on the Humber Estuary SPA / Ramsar / SAC and Lower Derwent Valley SAC regarding atmospheric pollution in the construction period were excluded. These sites were screened out from Appropriate Assessment in relation to this impact pathway.

## 8.6 In-Combination Assessment

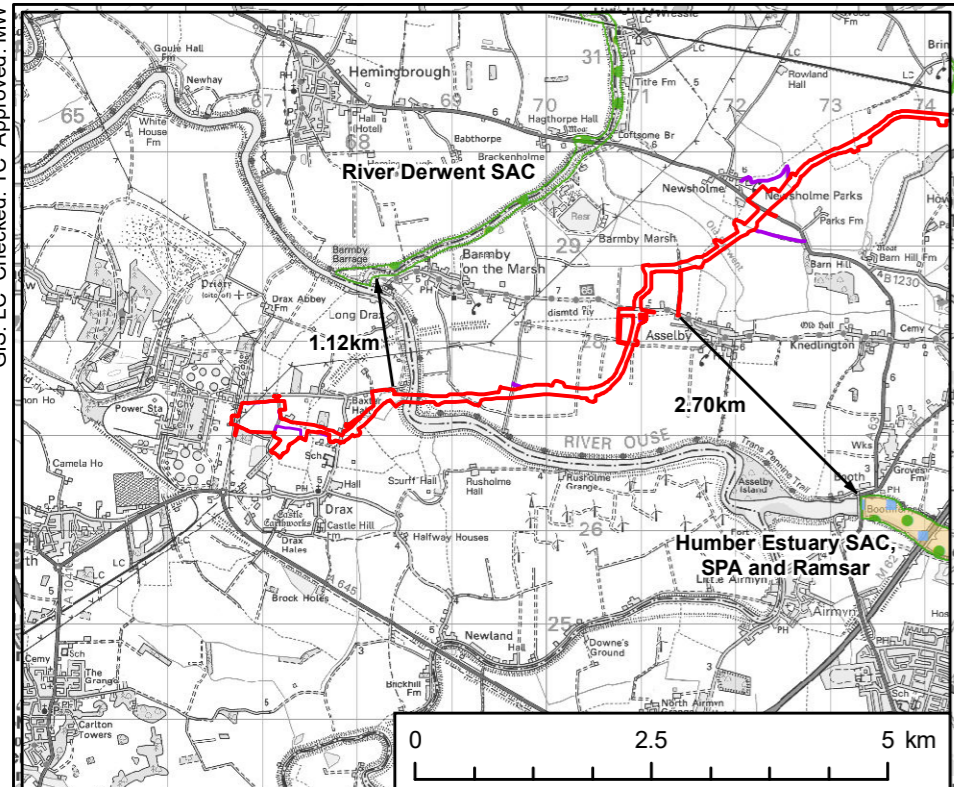
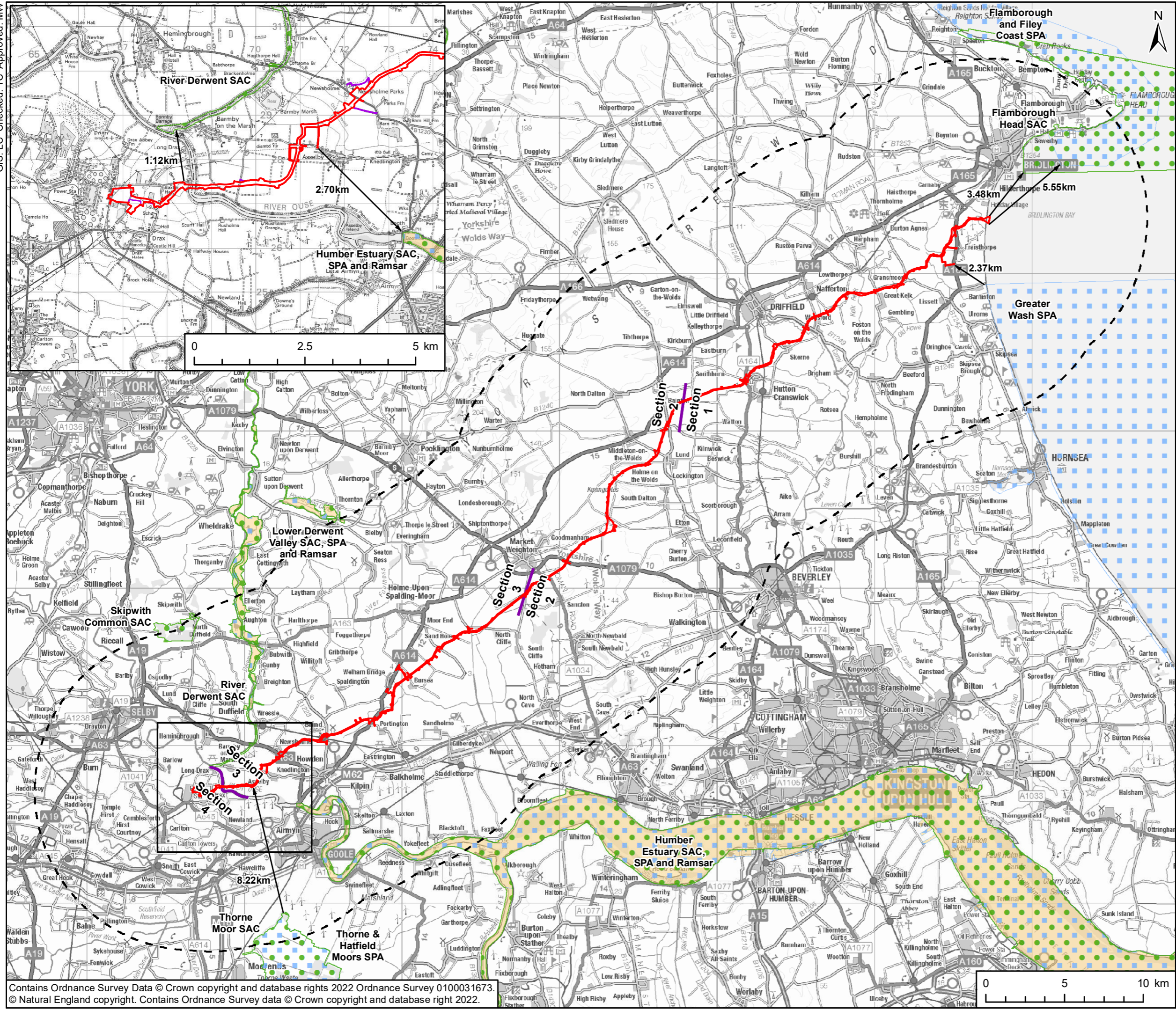
The potential of the English Onshore Scheme to result in cumulative impacts in-combination with other plans and projects was also assessed. However, in-combination likely significant effects were excluded for all such proposals. Most impacts of the English Onshore Scheme are temporary, and it already includes sufficient mitigation to address its potential effects on water quality and otter mobility. Furthermore, all other proposals with linking impact pathways will also need to undergo HRA and ensure that adequate mitigation measures are in place to address potential adverse effects on site integrity.



## **Appendix A Location of the English Onshore Scheme in relation to the European sites within a 10 km Zone of Influence (Zoi)**



- KEY
- Planning Application Boundary
  - 10km Study Area
  - Route Section Break
  - Ramsar
  - Special Area of Conservation
  - Special Protection Area



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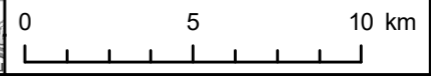
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TITLE  
**Appendix A  
European sites within the 10km Zone of  
Influence (Zoi) of the English Onshore  
Scheme**

REFERENCE  
SEGL2\_T\_HRA\_A\_v2\_20220526

SHEET NUMBER  
1 of 1

DATE  
26/05/2022



Scale @ A3 1:225,000 / 1:80,000

Coordinate System: British National Grid

GIS: LC Checked: TC Approved: MW



## Appendix B European Sites Background

### Humber Estuary SPA / Ramsar

#### Introduction

The Humber Estuary is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Other notable habitats include a range of sand dune types in the outer estuary, together with sub-tidal sandbanks and coastal lagoons. As salinity declines upstream tidal reedbeds and brackish saltmarsh communities fringe the estuary.

The estuary is used by many species of wintering and passage waterbirds attracted by the different habitats of the SPA. For example, the sandy sediments of the outer estuary typically attract knot and grey plover, while waterfowl prefer the wetland zones of the upper estuary. At high tide, large mixed flocks congregate in key roost sites which are at a premium due to the combined effects of extensive land claim, coastal squeeze and lack of grazing marsh and grassland on both banks of the estuary. In summer, the site supports important breeding populations of Bittern *Botaurus stellaris*, Marsh harrier *Circus aeruginosus*, Avocet *Recurvirostra avosetta* and Little tern *Sternula albifrons*.

A number of developing managed realignment sites on the estuary are providing replacement habitats which contribute to the variety of habitats available to the bird features.

#### SPA Qualifying Species<sup>30</sup>

Qualifying species of the SPA:

- Bittern *Botaurus stellaris* - 10.5% of the population in Great Britain (breeding)
- Bittern - 4% of the population in Great Britain (non-breeding)
- Marsh harrier *Circus aeruginosus* - 6.3% of the population in Great Britain (breeding)
- Pied avocet *Recurvirostra avosetta* – 8.6% of the breeding population in Great Britain (breeding)
- Pied avocet - 1.7% of the population in Great Britain (non-breeding)
- Little tern *Sternula albifrons* - 2.1% of the breeding population in Great Britain (breeding)
- Hen harrier *Circus cyaneus* - 1.1% of the population in Great Britain (non-breeding)
- Bar-tailed godwit *Limosa lapponica* – 4.4% of the population in Great Britain (non-breeding)
- Golden plover *Pluvialis apricaria* – 12.3% of the population in Great Britain (non-breeding)
- Ruff *Philomachus pugnax* - 1.4% of the population in Great Britain (passage)
- Dunlin *Calidris alpina alpina* – 1.7% of the population (non-breeding)
- Dunlin - 1.5% of the population (passage)
- Red knot *Calidris canutus* – 6.3% of the population (non-breeding)
- Red knot – 4.1% of the population (passage)
- Black-tailed godwit *Limosa limosa islandica* – 3.2% of the population (non-breeding)
- Black-tailed godwit – 2.6% of the population (passage)
- Shelduck *Tadorna tadorna* – 1.5% of the population (non-breeding)
- Common redshank *Tringa totanus* - 3.6% of the population (non-breeding)
- Common redshank - 5.7% of the population (passage)

<sup>30</sup> Available at: <https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9006111.pdf> [Accessed on the 26/04/2022]

The site regularly supports over 20,000 waterfowl. Over winter the site regularly supports: 153,934 waterfowl

## Ramsar Qualifying Features

### Ramsar 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.

### Ramsar Criterion 3

The Humber Estuary Ramsar site supports a breeding colony of grey seals *Halichoerus grypus* at Donna Nook. It is the second largest seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*.

### Ramsar Criterion 5

Assemblage of international importance: 153,934 waterfowl (non-breeding season)

### Ramsar Criterion 6

Species/populations occurring at levels of international importance:

- Golden plover – 17,996 individuals – average of 2.2% of the north western Europe, west continental Europe, north western Africa population (passage)
- Golden plover – 30,709 individuals – average 3.8% of the north western Europe, west continental Europe, north western Africa population (wintering)
- Red knot – 18,500 individuals – average of 4.1% of the population (passage)
- Red knot – 28,165 individuals – average 6.3% of the population (wintering)
- Dunlin – 20,269 individuals – average of 1.5% of the western Europe population (passage)
- Dunlin – 22,222 individuals – average of 1.7% of the western Europe population (wintering)
- Black-tailed godwit – 915 individuals – average of 2.6% of the population (passage)
- Black-tailed godwit – 1,113 individuals – average of 3.2% of the population (wintering)
- Common redshank – 7,462 individuals – average of 5.7% of the population (passage)
- Common redshank – 4,632 individuals – average of 3.6% of the population (wintering)
- Shelduck – 4,464 individuals – average of 1.5% of the north western Europe population (wintering)
- Bar-tailed godwit – 2,752 individuals – average 2.3% of the population (wintering)

### Ramsar 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 area.

## Conservation Objectives<sup>31</sup>

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;

<sup>31</sup> Available at: <http://publications.naturalengland.org.uk/file/5874535631159296> [Accessed on the 26/04/2022]

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.

### **Threats / Pressures to Site Integrity<sup>32</sup>**

The following threats / pressures to the integrity of the Humber Estuary SPA have been identified in Natural England's Site Improvement Plan:

- Water pollution
- Coastal squeeze
- Changes in species distribution
- Undergrazing
- Invasive species
- Natural changes to site conditions
- Public access / disturbance
- Fisheries: fish stocking
- Direct land take from development
- Air pollution: Impact of atmospheric nitrogen deposition
- Shooting / scaring
- Direct impact from third party
- Inappropriate scrub control

## **Humber Estuary SAC**

### **Introduction**

The Humber Estuary is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Other notable habitats include a range of sand dune types in the outer estuary, together with sub-tidal sandbanks and coastal lagoons. As salinity declines upstream tidal reedbeds and brackish saltmarsh communities fringe the estuary. Significant fish species include river lamprey and sea lamprey which migrate through the estuary to breed in the rivers of the Humber catchment. Grey seals come ashore in autumn to form large breeding colonies on the sandy shores of the south bank around Donna Nook.

### **Qualifying Features<sup>33</sup>**

Annex I habitats that are a primary reason for selection of this site:

- Estuaries
- Mudflats and sandflats not covered by seawater at low tide

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

<sup>32</sup> Available at: <http://publications.naturalengland.org.uk/file/5730884670980096> [Accessed on the 26/04/2022]

<sup>33</sup> Available at: <https://sac.incc.gov.uk/site/UK0030170> [Accessed on the 26/04/2022]

- Sandbanks which are slightly covered by sea water all the time
- Coastal lagoons
- Salicornia and other annuals colonising mud and sand
- 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*

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Sea lamprey *Petromyzon marinus*
- River lamprey *Lampetra fluviatilis*
- Grey seal *Halichoerus grypus*

### Conservation Objectives<sup>34</sup>

With regard to the natural habitats and/or species for which the site has been designated (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 Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

### Threats / Pressures to Site Integrity<sup>35</sup>

The following threats / pressures to the integrity of the Humber Estuary SAC have been identified in Natural England’s Site Improvement Plan:

- Water pollution
- Coastal squeeze
- Change in species distributions
- Undergrazing
- Invasive species
- Natural changes in site conditions
- Public access / disturbance
- Fisheries: Coastal marine and estuarine
- Direct land take from development
- Air pollution: Impact of atmospheric nitrogen deposition

<sup>34</sup> Available at: <http://publications.naturalengland.org.uk/file/6294287600058368> [Accessed on the 26/04/2022]

<sup>35</sup> Available at: <http://publications.naturalengland.org.uk/file/5730884670980096> [Accessed on the 26/04/2022]



- Direct impact from third parties

## River Derwent SAC

### Introduction

The River Derwent SAC represents one of the best examples of a lowland classic river profile stretching from Ryemouth to the confluence of the Ouse. It supports diverse communities of flora and fauna, notably floating vegetation dominated by water crowfoot; and river lamprey, sea lamprey, otter and bullhead.

### Qualifying Features<sup>36</sup>

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

- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

Annex II species that are a primary reason for selection of this site

- River lamprey *Lampetra fluviatilis*

Annex II species present as a qualifying feature, but not a primary reason for selection of the site

- Sea lamprey *Petromyzon marinus*
- Bullhead *Cottus gobio*
- Otter *Lutra lutra*

### Conservation Objectives<sup>37</sup>

With regard to the SAC and the natural habitats and/or species for which the site has been designated (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 Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of 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.

### Threats / Pressures to Site Integrity<sup>38</sup>

The following threats / pressures to the integrity of the River Derwent SAC have been identified in Natural England's Site Improvement Plan:

- Physical modification
- Water pollution
- Invasive species
- Change in land management
- Water abstraction

<sup>36</sup> Available at: <https://sac.jncc.gov.uk/site/UK0030253> [Accessed on the 26/04/2022]

<sup>37</sup> Available at: <http://publications.naturalengland.org.uk/file/6514109101375488> [Accessed on the 26/04/2022]

<sup>38</sup> Available at: <http://publications.naturalengland.org.uk/file/4873723815395328> [Accessed on the 26/04/2022]

## Lower Derwent Valley SAC

### Introduction

The Lower Derwent Valley SAC is one of the largest areas of traditionally managed flood plain meadows in England. It is 921.26 ha in size and comprises humid grassland (64 %), bogs / marshes (30 %), inland water bodies (3 %), broad-leaved deciduous woodland (2 %) and dry grassland / steppes (1 %). Locally, the meadows are known as lngs, which support a diverse assemblage in wildflowers in spring and autumn, as well as important breeding communities of birds, dragonflies, invertebrates and otters. Flooding events in winter attract an internationally important population of waterfowl. In addition to open grassland, the valley also comprises pockets of alder woodland.

The SAC comprises the greatest array of examples of high-quality examples of lowland hay meadows anywhere in the UK. A notable feature of the meadows is the rare narrow-leaved water-dropwort *Oenanthe silaifolia*. The traditional management of the site ensures the good development of ecological variation within the site, including transitions between different grassland types, swamp and fen vegetation.

### Qualifying Features<sup>39</sup>

Annex I habitats that are a primary reason for selection of this site:

- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

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

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Otter *Lutra lutra*

### Conservation Objectives<sup>40</sup>

With regard to the SAC and the natural habitats and/or species for which the site has been designated (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 Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of 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.

### Threats / Pressures to Site Integrity<sup>41</sup>

The following threats / pressures to the integrity of the Lower Derwent Valley SAC have been identified in Natural England's Site Improvement Plan:

- Hydrological changes
- Drainage
- Public access / disturbance
- Invasive species

<sup>39</sup> Available at: <https://sac.jncc.gov.uk/site/UK0012844> [Accessed on the 26/04/2022]

<sup>40</sup> Available at: <http://publications.naturalengland.org.uk/publication/5660734323163136> [Accessed on the 26/04/2022]

<sup>41</sup> Available at: <http://publications.naturalengland.org.uk/publication/5916047525806080> [Accessed on the 26/04/2022]

- Undergrazing
- Inappropriate scrub control
- Air pollution: Impact of atmospheric nitrogen deposition

## Lower Derwent Valley SPA / Ramsar

### Introduction

The Lower Derwent Valley SAC (described above) is also designated as a SPA for providing important breeding habitat for waterfowl, including ducks and waders. In winter, the site supports internationally important numbers of waterfowl.

### SPA Qualifying Species<sup>42</sup>

During the non-breeding season the SPA regularly supports the following species listed in Annex I of the Wild Birds Directive (Article 4.1):

- Bewick's swan *Cygnus columbianus bewickii*
- European golden plover *Pluvialis apricaria*
- Ruff *Philomachus pugnax*

During the breeding season the SPA regularly supports the following species listed in Annex I of the Wild Birds Directive (Article 4.2):

- Northern shoveler *Anas clypeata*
- Eurasian wigeon *Anas Penelope*
- Eurasian teal *Anas crecca*

The site also qualifies under Article 4.2 by regularly supporting over 20,000 wintering waterfowl. In the five year period 1986/87 – 1990/91 the site held a mean peak of 27,580 birds, comprising 17,415 wildfowl and 10,165 waders.

### Ramsar Qualifying Features<sup>43</sup>

The Lower Derwent Valley is designated as a Ramsar for the following criteria:

#### Ramsar Criterion 1

The site represents one of the most important examples of traditionally managed species-rich alluvial flood meadow habitat remaining in the UK. The river and flood meadows play a substantial role in the hydrological and ecological functioning of the Humber Basin.

#### Ramsar Criterion 2

The site has a rich assemblage of wetland invertebrates including 16 species of dragonfly and damselfly, 15 British Red Data Book wetland invertebrates as well as leafhopper, *Cicadula ornata* for which Lower Derwent Valley is the only known site in Great Britain.

#### Ramsar Criterion 4

The site qualifies as a staging post for passage birds in spring. Of particular note are the nationally important numbers of ruff *Philomachus pugnax* and whimbrel *Numenius phaeopus*.

#### Ramsar Criterion 5

Assemblages of international importance

<sup>42</sup> Available at: <http://publications.naturalengland.org.uk/publication/6223883187257344> [Accessed on the 26/04/2022]

<sup>43</sup> Available at: <https://jncc.gov.uk/jncc-assets/RIS/UK11037.pdf> [Accessed on the 26/04/2022]

Species with peak counts in winter: 31,942 waterfowl (5 year peak mean 1998/99 – 2002/03)

### Ramsar Criterion 6

Species / populations occurring at levels of international importance

Qualifying species / populations with peak counts in winter (identified at designation):

- Eurasian wigeon *Anas penelope* (8,350 individuals, representing an average of 2% of the GB population – 5 year peak mean 1998/99 – 2002/03)
- Eurasian teal *Anas crecca* (4,200 individuals, representing an average of 1% of the population – 5 year peak mean 1998/99 – 2002/03)

### **Conservation Objectives<sup>44</sup>**

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.

### **Threats / Pressures to Site Integrity<sup>45</sup>**

The following threats / pressures to the integrity of the Lower Derwent Valley SPA have been identified in Natural England's Site Improvement Plan:

- Hydrological changes
- Drainage
- Public access / disturbance
- Invasive species
- Undergrazing
- Inappropriate scrub control
- Air pollution: Impact of atmospheric nitrogen deposition

## **Skipwith Common SAC**

### **Introduction**

The Skipwith Common SAC is a 294.6 ha large site comprising heath / scrub (55 %), broad-leaved deciduous woodland (27 %), inland water bodies (5 %), bogs / marshes (5 %), dry grassland / steppes (5 %) and mixed woodland (3 %). It represents one of only two extensive areas of open heathland in the Vale of York. The SAC has long-standing recognition of its importance to nature conservation, particularly as the largest tract of wet heathland in northern England. Due to the prevailing mosaic of habitats, the site supports important bird and invertebrate assemblages. For example, a range of heathland specialists including tree pipit, green woodpecker, woodlark and occasional nightjar are found within the site boundary. Today, the site is also managed as a National Nature Reserve by the owner in cooperation with Natural England.

<sup>44</sup> Available at: <http://publications.naturalengland.org.uk/publication/6223883187257344> [Accessed on the 26/04/2022]

<sup>45</sup> Available at: <http://publications.naturalengland.org.uk/publication/5916047525806080> [Accessed on the 26/04/2022]

### Qualifying Features<sup>46</sup>

Annex I habitats that are a primary reason for selection of this site:

- Northern Atlantic wet heaths with *Erica tetralix*
- European dry heaths

### Conservation Objectives<sup>47</sup>

With regard to the SAC and the natural habitats and/or species for which the site has been designated (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 Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of the qualifying natural habitats;
- The structure and function (including typical species) of the qualifying natural habitats and,
- The supporting processes on which the qualifying natural habitats rely.

### Threats / Pressures to Site Integrity<sup>48</sup>

The following threats and pressures to the integrity of the Skipwith Common SAC have been identified in Natural England's Site Improvement Plan:

- Public access / disturbance
- Inappropriate scrub control
- Drainage
- Air pollution: Impact of atmospheric nitrogen deposition

## Thorne and Hatfield Moors SPA

### Introduction

The Thorne and Hatfield Moors SPA is an extensive area comprising a lowland raised mire system in northern England and the largest remaining area of lowland peatland in England. The habitat mosaic in the SAC supports complex bird assemblages including many breeding species, most notably nightjar (for which the SPA is designated).

### Qualifying Features<sup>49</sup>

The site is designated as an SPA for the following Annex II species referred to in Article 4 of the EEC Directive:

- European nightjar *Caprimulgus europaeus*

### Conservation Objectives<sup>50</sup>

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

<sup>46</sup> Available at: <https://sac.jncc.gov.uk/site/UK0030276> [Accessed on the 05/05/2022]

<sup>47</sup> Available at: <http://publications.naturalengland.org.uk/publication/5391567648980992> [Accessed on the 05/05/2022]

<sup>48</sup> Available at: <http://publications.naturalengland.org.uk/publication/6301721630343168> [Accessed on the 05/05/2022]

<sup>49</sup> Available at: <https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9005171.pdf> [Accessed on the 05/05/2022]

<sup>50</sup> Available at: <http://publications.naturalengland.org.uk/publication/6503407711944704> [Accessed on the 05/05/2022]

- 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.

### **Threats / Pressures to Site Integrity<sup>51</sup>**

The following threats and pressures to the site integrity of the Thorne and Hatfield Moors SPA have been identified in Natural England's Site Improvement Plan:

- Drainage
- Inappropriate scrub control
- Air pollution: Impact of atmospheric nitrogen deposition
- Public access / disturbance
- Planning permissions
- Peat extraction
- Invasive species

## **Thorne Moor SAC**

### **Introduction**

The Thorne Moor SAC is a 1911.02 ha large site comprising bogs / marshes (28 %), heath / scrub (19 %), broad-leaved deciduous woodland (13 %), inland water bodies (8 %) and 'other land' (32 %). Constituting England's largest area of raised bog, the site lies within the former floodplain of rivers feeding into the Humber estuary. The moors lie on a flat plain that drained out through the Humber Gap after the last ice age.

Drainage, land reclamation for agriculture and peat extraction resulted in the loss of much of the former 500 square mile marsh and fen, leaving the Thorne and Hatfield Moors as the only remnant. Despite the extensive damage through peat extraction and drainage, the moors retain significant wildlife interest (including for breeding nightjar). In the present day, the site is situated amidst a landscape of intensively managed agriculture.

### **Qualifying Features<sup>52</sup>**

Annex I habitats that are a primary reason for selection of this site:

- Degraded raised bogs still capable of natural regeneration

### **Conservation Objectives<sup>53</sup>**

With regard to the SAC and the natural habitats and/or species for which the site has been designated (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 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.

<sup>51</sup> Available at: <http://publications.naturalengland.org.uk/publication/6489780632158208> [Accessed on the 05/05/2022]

<sup>52</sup> Available at: <https://sac.incc.gov.uk/site/UK0012915> [Accessed on the 05/05/2022]

<sup>53</sup> Available at: <http://publications.naturalengland.org.uk/publication/6566028335120384> [Accessed on the 05/05/2022]

## Threats / Pressures to Site Integrity<sup>54</sup>

The following threats and pressures to the site integrity of the Thorne Moor SAC have been identified in Natural England's Site Improvement Plan:

- Drainage
- Inappropriate scrub control
- Air pollution: Impact of atmospheric nitrogen deposition
- Public access / disturbance
- Planning permissions
- Peat extraction
- Invasive species

## Flamborough Head SAC

### Introduction

The Flamborough Head SAC is a coastal European site that is 6,403.01 ha in size and comprises marine areas / sea inlets (97 %), shingle / sea cliffs (2 %) and improved grassland (1 %). It covers an area north of Bridlington to Speeton, where the cliffs project into the North Sea, exposing a wide section of chalk strata. The cliff-top vegetation comprises maritime grassland as well as other plant species more typical of chalk grassland.

The sublittoral and littoral reef habitats are the most diverse in the UK, including rocks that extend into the subtidal area. Chalk reefs comprising kelp forests are found out to a distance of 2 km into the sea. More than 200 caves occur within the site, particularly surrounding the headland and north-facing cliffs. These harbour communities of specialised cave algae.

### Qualifying Features<sup>55</sup>

Annex I habitats that are a primary reason for selection of this site:

- Reefs
- Vegetated sea cliffs of the Atlantic and Baltic Coasts
- Submerged or partially submerged sea caves

### Conservation Objectives<sup>56</sup>

With regard to the SAC and the natural habitats and/or species for which the site has been designated (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 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

### Threats / Pressures to Site Integrity<sup>57</sup>

The following threats / pressures to the integrity of the Flamborough Head SAC have been identified in Natural England's Site Improvement Plan:

<sup>54</sup> Available at: <http://publications.naturalengland.org.uk/publication/6489780632158208> [Accessed on the 05/05/2022]

<sup>55</sup> Available at: <https://sac.jncc.gov.uk/site/UK0013036> [Accessed on the 26/04/2022]

<sup>56</sup> Available at: <http://publications.naturalengland.org.uk/publication/5660734323163136> [Accessed on the 26/04/2022]

<sup>57</sup> Available at: <http://publications.naturalengland.org.uk/publication/6404364100960256> [Accessed on the 26/04/2022]

- Changes in species distributions
- Marine and freshwater fishery
- Public access / disturbance
- Invasive species

## Flamborough and Filey Coast SPA

### Introduction

The SPA straddles the border of East Yorkshire and North Yorkshire on the western coast of the North Sea. It comprises two distinct sections, including Flamborough to the south and Filey to the north. Both sections encompass clifftops, sea cliffs and intertidal rock habitats out to 2 km from the coastline. The SPA provides ideal nesting conditions for seabirds, such as rock ledges, crevices and caves, supporting the largest mainland seabird nesting colony in the UK. For example, the largest kittiwake, guillemot and razorbill colonies in England / UK are found here. During the breeding season over 200,000 seabirds use the cliff habitats, which provide excellent protection from mammalian predators.

The open water section out to 2 km from the coastline provides habitat for a range of natural behaviours, including bathing, preening, displaying, loafing and foraging. The Flamborough Front, essentially the mixing zone for different water layers, creates nutrient-rich waters that contribute to increased productivity and the diverse array of unusual marine species found in the area.

### Qualifying Species<sup>58</sup>

The SPA is designated for the following breeding species:

- Gannet *Morus bassanus*
- Guillemot *Uria aalge*
- Kittiwake *Rissa tridactyla*
- Razorbill *Alca torda*

Under Article 4.2 of the EU Birds Directive, the Flamborough and Filey Coast SPA also qualifies for its breeding seabird assemblage, regularly supporting over 20,000 seabirds in any season. Overall, the SPA is regularly used by at least 216,730 individual seabirds (JNCC, 2013).

### Conservation Objectives<sup>59</sup>

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.

### Threats / Pressures to Site Integrity<sup>60</sup>

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<sup>58</sup> Available at:

<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9006101&SiteName=flamb&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=&HasCA=1&NumMarineSeasonality=4&SiteNameDisplay=Flamborough+and+Filey+Coast+SPA#SiteInfo> [Accessed on the 26/04/2022]

<sup>59</sup> <http://publications.naturalengland.org.uk/publication/5400434877399040> [Accessed on the 26/04/2022]

<sup>60</sup> Available at: <http://publications.naturalengland.org.uk/publication/6404364100960256> [Accessed on the 26/04/2022]



The following threats / pressures to the integrity of the Flamborough and Filey Coast SPA have been identified in Natural England's Site Improvement Plan:

- Changes in species distributions
- Marine and freshwater fishery
- Public access / disturbance
- Invasive species

## Greater Wash SPA

### Introduction

The Greater Wash SPA stretches along the east coast of England in the mid-southern North Sea, extending between the counties of Yorkshire and Suffolk. Given that the site boundary extends beyond 12 nautical miles, both Natural England and the JNCC provide obligatory statutory advice. The main purpose of the SPA is to protect open water habitat for marine species, including red-throated diver (*Gavia stellate*), common scoter (*Melanitta nigra*) and little gull (*Hydrocoloeus minutus*) during the overwintering period, as well as vital foraging habitat for breeding sandwich tern (*Sterna sandvicensis*), common tern (*Sterna hirundo*) and little gull (*Sternula albifrons*).

Overall, the SPA covers an area of 3,536 km<sup>2</sup>, which comprises a range of marine habitats, such as intertidal mudflats and sandflats, subtidal sandbanks and biogenic reef. A large proportion of the designated area is below 30 m in water depth, with a deep channel of 90 m depth at the Wash approaches. The protected area was based on boat-based visual tracking surveys of birds from the colonies of interest.

### Qualifying Species<sup>61</sup>

The site is designated as a SPA for the following Annex I species:

- Red-throated diver *Gavia stellate* (non-breeding)
- Little gull *Hydrocoloeus minutus* (non-breeding)
- Common scoter *Melanitta nigra* (non-breeding)
- Sandwich tern *Sterna sandvicensis* (breeding)
- Little tern *Sternula albifrons* (breeding)
- Common tern *Sterna hirundo* (breeding)

### Conservation Objectives<sup>62</sup>

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.

### Threats / Pressures to Site Integrity

<sup>61</sup> Available at: <https://jncc.gov.uk/our-work/greater-wash-spa/#summary> [Accessed on the 26/04/2022]

<sup>62</sup> Available at: <http://publications.naturalengland.org.uk/publication/4597871528116224> [Accessed on the 26/04/2022]

No Site Improvement Plan or detailed advice on operations have been published for the Greater Wash SPA. The following threats / pressures to the integrity of the SPA have been compiled from the Supplementary Advice Note on Conservation Objectives<sup>63</sup>:

- Changes in species distributions
- Marine and freshwater fishery
- Water quality
- Collision with offshore structures (e.g. wind turbines)
- Predation

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<sup>63</sup> Available at:  
<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006101&SiteName=flamb&SiteNameDisplay=Flamborough+and+Filey+Coast+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCArea=&NumMarineSeasonality=4> [Accessed on the 26/04/2022]



