

Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three Offshore Wind Farm

Preliminary Environmental Information Report:
Annex 3.1 – Onshore Ornithology – Wintering Bird Survey Report

Date: July 2017

Hornsea 3
Offshore Wind Farm

DONG
energy

Environmental Impact Assessment

Preliminary Environmental Information Report

Volume 6

Annex 3.1 – Onshore Ornithology – Wintering Bird Survey Report

Report Number: P6.6.3.1

Version: Final

Date: July 2017

This report is also downloadable from the Hornsea Project Three offshore wind farm website at:

www.dongenergy.co.uk/hornseaproject3

DONG Energy Power (UK) Ltd.

5 Howick Place,

London, SW1P 1WG

© DONG Energy Power (UK) Ltd, 2017. All rights reserved

Front cover picture: Kite surfer near one of DONG Energy's UK offshore wind farms © DONG Energy Hornsea Project Three (UK) Ltd., 2016.

Liability

This report has been prepared by NIRAS, with all reasonable skill, care and diligence within the terms of their contract with DONG Energy Power (UK) Ltd or a subcontractor to NIRAS placed under NIRAS' contract with DONG Energy Power (UK) Ltd as the case may be.

Hornsea Project Three Offshore Wind Farm



Hornsea Three Offshore Wind Farm

Onshore Ornithology – Wintering Survey Report

Prepared Ian Ellis and Robin Ward (NIRAS) – April 2017
Checked Jennifer Brack, 27 June 2017
Accepted Sophie Banham, 27 June 2017
Approved Sophie Banham, 27 June 2017

Doc. no. 2832023
Ver. no. 2832023
Case no. 200-15-3309

Table of Contents

1.	Introduction.....	4
1.1	Background	4
1.2	Legislation and guidance	4
1.3	Consultation	5
1.4	Scope of surveys.....	5
1.5	Survey objectives and aims	5
2.	Methodology.....	6
2.1	SPA functionally linked habitat.....	6
2.2	Permanent land take	8
2.3	Export Cable Route	9
2.4	Survey constraints.....	9
3.	Results	10
3.1	SPA functionally linked habitat.....	10
3.1.1	Pink-footed goose	10
3.1.2	Additional species recorded	13
3.2	Permanent land take	15
3.2.1	Onshore HVAC booster station.....	15
3.2.2	Onshore HVDC Converter / HVAC Substation	16
3.3	Export Cable Route	17
3.3.1	Annex 1 and Schedule 1 species.....	17
3.3.2	Species of Principal Importance / Red List species	18
4.	Summary	21
5.	References	22
6.	Appendices.....	23
6.1	SPA functionally linked habitat surveys – field locations	23
	Appendix 6.1a – SPA functionally linked habitat survey field locations part 1.....	24
	Appendix 6.1b – SPA functionally linked habitat survey field locations part 2.....	25
	Appendix 6.1c – SPA functionally linked habitat survey field locations part 3.....	26
	Appendix 6.1d – SPA functionally linked habitat survey field locations part 4.....	27
	Appendix 6.1e – SPA functionally linked habitat survey field locations part 5.....	28
	Appendix 6.1f – SPA functionally linked habitat survey field locations part 6.....	29
6.2	Permanent land take locations.....	30
	Appendix 6.2a – Survey location of the Onshore HVAC Booster Station.....	30

Appendix 6.2b – Survey location of the Onshore HVDC Converter / HVAC Substation.	31
6.3 Export Cable Route Point Counts	32
Appendix 6.3a – Point Count locations part 1.	32
Appendix 6.3b – Point Count locations part 2.	33
Appendix 6.3c – Point Count locations part 3.	34
Appendix 6.3d – Point Count locations part 4.	35
Appendix 6.3e – Point Count locations part 5.	36
6.4 Reference populations for species of conservation interest	37
6.5 Systematic list of all species recorded in Export Cable Route and permanent land take surveys	39

1. Introduction

1.1 Background

Ornithological baseline surveys are required to inform the Environmental Impact Assessment (EIA) of the onshore infrastructure associated with Hornsea Three Offshore Wind Farm (Hornsea Three). NIRAS was commissioned by DONG Energy (UK) Ltd on behalf of Hornsea Project Three Offshore Wind Farm (hereafter referred to as Hornsea Three) to undertake surveys for wintering birds, which were conducted between October 2016 and March 2017.

Hornsea Three is a proposed offshore wind farm located in the southern North Sea, with a total generating capacity of up to 2,400 MW. The onshore cable corridor search area (ECR) has been identified by Hornsea Three. It is a broad 200 m wide cable corridor search area within which the refined onshore export cable corridor (80 m width) will be located. It is approximately 55 km in length running from Weybourne on the north Norfolk coast, southwards through Norfolk, and ending in the vicinity of Swardston, south-west of Norwich. The proposed development also includes the onshore HVAC booster station (Barningham), onshore HVDC converter/HVAC substation (Mangreen South) and interconnection with the Norwich Main National Grid substation.

1.2 Legislation and guidance

All birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (WCA 1981, as amended), which makes it an offence to intentionally kill, injure or take any wild bird, or take, damage or destroy the nest while in use or being built, or take or destroy an egg.

Certain species of bird that are listed in Schedule 1 of the Act receive additional protection. For these species it is also an offence to recklessly disturb a bird while it is on its nest or to disturb the dependant young of such a species.

In addition, the Natural Environment and Rural Communities Act 2006 (NERC Act 2006) requires a list to be prepared of those habitats and species, including birds, which are considered to be of principal importance for the conservation of biological diversity in England.

Further guidance on the conservation status of birds in the UK is provided by Birds of Conservation Concern 4 (BoCC4; Eaton *et al.*, 2015) which uses standardized criteria to assess the status of species with breeding, passage or wintering populations in the UK. A total of 244 species have been assigned to the Red, Amber or Green lists of conservation concern.

Reference populations to be used to determine a baseline characterisation of wintering birds with respect to Hornsea Three are taken from the following sources:

- National populations – Musgrove *et al.* (2013);
- North Norfolk Coast SPA designated populations (JNCC^{1,2}); and
- Norfolk County populations -Taylor and Marchant (2011).

¹ <http://jncc.defra.gov.uk/default.aspx?page=2008>

² <http://jncc.defra.gov.uk/page-7309>

The reference populations for species recorded in the wintering bird surveys for Hornsea Three are presented in Appendix 6.4.

1.3 Consultation

Natural England were consulted on the proposed methodology for wintering birds in October 2016 and a response was received in November 2016. Subsequent revisions were made to the methodology following this advice. A final, agreed methodology and interim survey results were presented to members of the Onshore Ecology Expert Working Group (EWG) in February 2016. The EWG includes statutory (Natural England, Norfolk County Council) and non-statutory (RSPB, Norfolk Wildlife Trust) representatives that provide advice as part of the Evidence Plan process implemented for Hornsea Three.

1.4 Scope of surveys

Three components of wintering terrestrial bird surveys were conducted to inform the baseline characterisation of the onshore infrastructure associated with Hornsea Three:

- **North Norfolk Coast SPA functionally linked habitat survey** – to establish the use of functionally linked habitat by pink-footed goose within the potential zone of influence of the onshore Export Cable Route (ECR) corridor;
- **Survey of wintering birds in areas of permanent land take** – surveys of Onshore Substation Site options³ to establish the presence and abundance of any protected species or sensitive ornithological receptors; and,
- **Generic survey of wintering birds along the Onshore ECR corridor** - to establish the presence of any protected species or sensitive ornithological receptors.

Pink-footed goose was the principal target species for the functionally linked habitat survey as they are known to forage in areas outside of North Norfolk Coast SPA (Brides *et al.*, 2015). Whilst this 'functionally linked habitat' is not directly relevant to other species that are also features of the SPA, the survey also recorded these species as a matter of course.

The surveys of areas of permanent land take and the ECR recorded all species present although focus is given in this report to those species considered to be of some conservation importance³. A full systematic list of all species recorded is given in Appendix 6.5.

1.5 Survey objectives and aims

The objectives of the survey were to confirm whether or not target species of wintering birds utilise the survey area. With respect to the surveys of functionally linked habitat and permanent land take respectively, there was an objective to determine the abundance numbers and locations these species.

The aim of the surveys was to provide baseline data that will inform the characterisation and valuation of the site for target species which in turn will inform an impact assessment of the likely impacts on terrestrial wintering birds of the Hornsea Three onshore development.

³ Species listed on Annex 1 of the EU Birds Directive, Schedule 1 of the Wildlife & Countryside Act (1981); Species of Principal Importance (NERC Act 2006); BoCC4 Red and Amber List species (Eaton *et al.*, 2015).

2. Methodology

2.1 SPA functionally linked habitat

The use of functionally linked habitat by SPA/Ramsar citation species e.g. Pink-footed goose, within the northern end of the onshore ECR close to landfall plus 1 km buffer, was achieved by systematic road transects of the whole potential foraging area. Two experienced ornithologists equipped with binoculars and telescopes, together surveyed the area. Where potential foraging areas were not visible from road, public footpaths were used to view. The behaviour, location and extent of flocks and individual geese (and other SPA/Ramsar citation species) was recorded. The locations of birds were recorded directly onto a 1:10,000 scale Ordnance Survey base map of the study area (and adjacent land).

The survey was designed to determine the feeding / resting distribution of target species, whilst also identifying the food sources being used at the time within the onshore ECR corridor search area close to landfall plus 1 km buffer. The two species of geese that are qualifying features of the North Norfolk Coast SPA, pink-footed goose and dark-bellied Brent goose use inland waterbodies (pink-footed goose only) and intertidal areas for nocturnal roosts (Mitchell & Hearn 2004, Ward 2004). Such suitable localities are absent from the onshore ECR corridor search area (with buffer).

The southern extent of the wintering goose survey area was proposed to be 6 km inland from ECR landfall and was subject to the approval of Natural England. Subsequently Natural England provided advice and provided the Brides *et al.* (2015) report which provides mapping of pink-footed goose foraging distribution in England. On the basis of this advice, the survey area was extended in December 2016 to cover all areas within the ECR within 25 km of the proposed landfall (Figure 2.1). The survey area mostly involved arable land and each field was numbered for ease of reference (Appendix 6.1). Wetland habitat at Kelling Quags in the northern extremity of the survey area also occurs (see Appendix 6.1a for location). Kelling Quags is a nature reserve managed by the Norfolk Ornithological Association (NOA) as a coastal fresh marsh.

To ensure adequate coverage of potential functionally linked habitats and in particular to capture variations in behaviour and seasonal abundance, survey visits were conducted two weeks (twice monthly) within the survey period (late October 2016 – March 2017) which corresponded to eleven visits in total. Survey dates are detailed in Table 2.1.

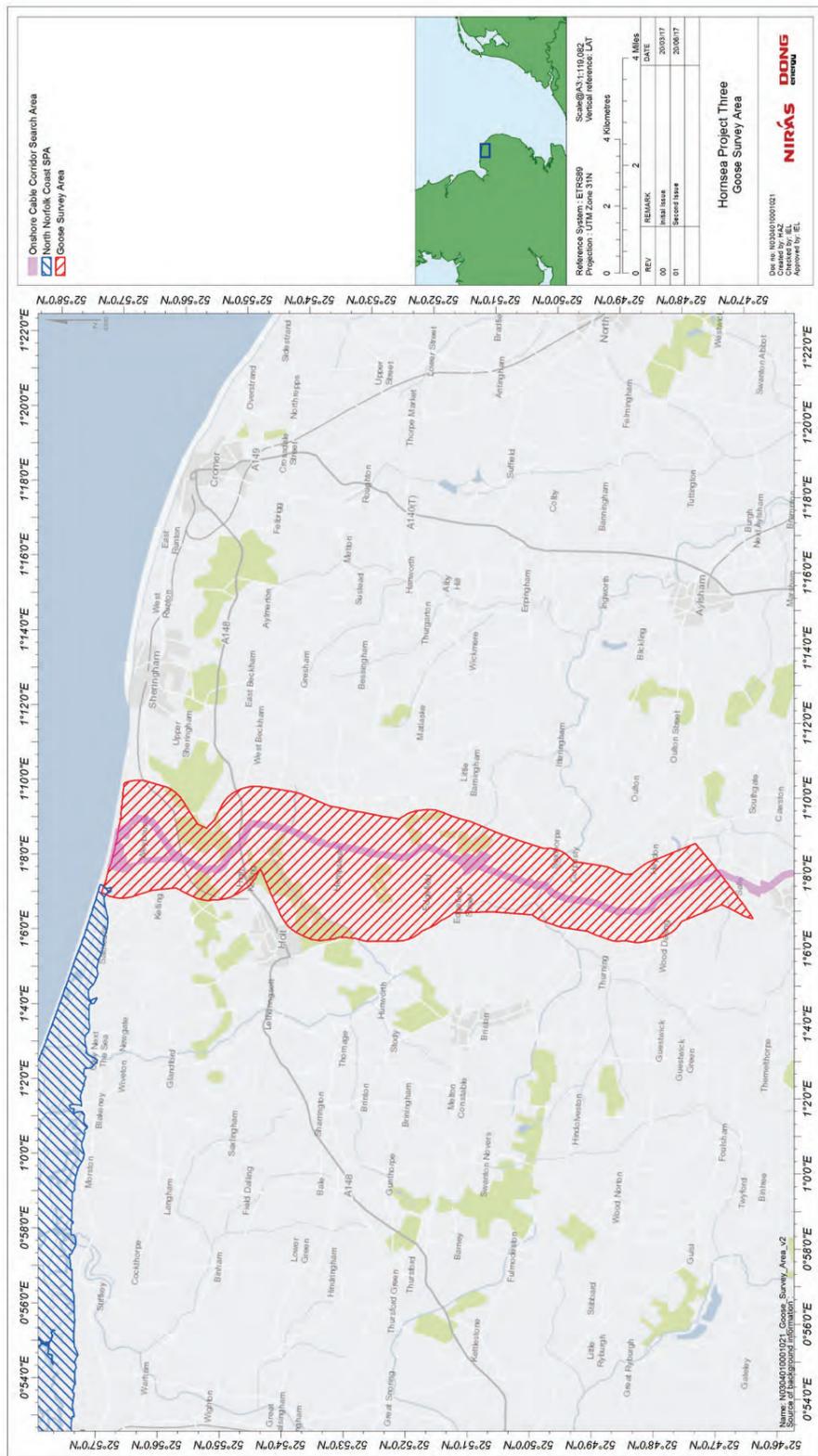


Figure 2.1: North Norfolk Coast SPA functionally linked habitat survey area October 2016 – March 2017.

Table 2.1: SPA functionally linked habitat survey dates

Survey	Month	Date
1	October	25/10/2016
2		07/11/2016
3	November	22/11/2016
4		01/12/2016
5	December	20/12/2016
6		16/01/2017
7	January	30/01/2017
8		13/02/2017
9	February	27/02/2017
10		07/03/2017
11	March	14/03/2017

In addition to the location and abundance of each target species, the surveys also recorded the following:

- **Food source / crop rotation** – each field within the survey area was surveyed in each visit and its crop type or status noted. This allows characterisation of what geese are feeding on at a field scale.
- **Field size** – the size of each field within the survey area was measured by GIS.
- **Flightlines of geese** – where geese were recorded flying over the survey area, the direction of flight and the flock size was noted.
- **Disturbance** – where disturbance events on goose flocks were observed these were recorded.

2.2 Permanent land take

A survey of wintering birds was conducted to establish the presence of any protected species or sensitive ornithological receptors at the onshore HVAC booster station and onshore HVDC converter / HVAC substation. The location of these sites including associated temporary works are shown in Appendix 6.2. Spatial coverage of these generic surveys of wintering birds wholly included the areas identified and a surrounding buffer of 100 m.

Survey visits were undertaken from shortly after dawn for a period of up to five hours during periods of good visibility and suitable weather conditions, i.e. avoiding persistent rain or fog, extreme temperatures and high winds. During each survey visit, an experienced ornithologist equipped with binoculars, walked slowly pre-set transects and within 100 m of every point within the survey area. The direction the route walked was alternated between visits and done using periodic scanning with binoculars. The behaviour, location and extent of flocks and individual birds was recorded. The locations of birds was recorded directly onto a 1:10,000 scale Ordnance Survey base map of the study area (and adjacent land).

To determine the presence of any protected species or sensitive ornithological receptors in the wintering bird abundance in the areas of permanent land take, four survey visits were conducted between November 2016 and March 2017 (Table 2.2).

Table 2.2: Wintering survey dates for onshore HVAC booster substation (Barningham) and onshore HVDC converter / HVAC substation (Mangreen South)

Survey	Onshore HVAC booster substation (Barningham)	Onshore HVDC converter / HVAC substation (Mangreen South)
1	16/12/2016	13/12/2016
2	27/01/2017	24/01/2017
3	24/02/2017	21/02/2017
4	10/03/2017	07/03/2017

2.3 Export Cable Route

A survey of wintering birds was conducted to establish the presence of any protected species or sensitive ornithological receptors along the onshore ECR.

The survey followed a point count methodology (Bibby et al., 1992) and during each survey visit, experienced ornithologists equipped with binoculars, visited where an intersection of the onshore ECR (with buffer, total width 500 m) with a public highway or right of way e.g. public footpath, occurs. At each intersection visited, a point count was undertaken by the surveyor. A survey did not start until five minutes after the surveyor had reached the point, to allow birds to settle down from any disturbance caused by the surveyor's arrival. The surveyor's viewshed (field of view) and habitat features was recorded during this period from a static position. A timed twenty minute of observations was then conducted from the fixed point. The behaviour, location and extent of flocks and individual birds detected were recorded. The locations of birds were recorded directly onto a 1:10,000 scale Ordnance Survey base map of the study area (and adjacent land).

The survey design allowed one intersection per 1 km of onshore ECR to be surveyed. Where a County Wildlife Site (CWS) was found to be present within the ECR then all attempts were made to locate a point count either within or adjacent to the CWS (Appendix 6.3).

Such a sampling regime provides a robust overview of the bird communities along the length of the onshore ECR proportionate to the habitats available. To determine the presence of any protected species or sensitive ornithological receptors in the wintering bird population along the onshore ECR, four survey visits have been conducted between November 2016 and March 2017.

2.4 Survey constraints

The survey of potential SPA functionally linked habitat was extended in December 2016 to take account of advice from Natural England. No significant numbers of geese were recorded in the survey area extension, so that it is considered that the reduced survey area surveyed from October 2016 to December 2016 is unlikely to have led to any data gaps to inform any assessment on SPA qualifying features.

3. Results

3.1 SPA functionally linked habitat

3.1.1 Pink-footed goose

Table 3.1 presents the counts of all pink-footed geese recorded within the surveys including those made during point counts. These comprise fifteen individual geese records within thirteen different field locations. Records are dominated by geese feeding on harvested sugar beet (only two records involved a field not of this crop type). Field size did not appear to be a notable driver to indicate goose presence – 10,000 were present on 1st December in a comparatively small field for example.

Table 3.1: SPA functionally linked habitat surveys: pink-footed goose results (records in red refer to those collected during point count surveys).

Date	Field	Crop type	Field size (km ²)	Count	Notes
25/10/2016	60	Stubble	0.11	65	
22/11/2016	30	Sugar beet	0.26	10,000	
01/12/2016	23	Sugar beet	0.12	10,000	
01/12/2016	25	Sugar beet	0.08	300	
20/12/2016	25	Fallow	0.08	870	
20/12/2016	27	Sugar beet	0.11	3,530	
				1,100	Tractor in field – geese not disturbed
16/01/2017	21	Sugar beet	0.11		
				2,180	Dog in field – geese moved short distance to fields 22/24
30/01/2017	21	Sugar beet	0.11		
30/01/2017	22	Sugar beet	0.06	218	
30/01/2017	24	Sugar beet	0.15	4,860	
25/11/2016	156/169	Young cereal / sugar beet	0.44	3,000	
24/11/2016	38	Sugar beet	0.11	1,325	
09/01/2017	35	Sugar beet	0.29	300	
09/01/2017	47	Sugar beet	0.20	9,000	
06/02/2017	35	Sugar beet	0.29	270	

The results are dominated by a large flock of pink-footed geese (plus associating European white-fronted, tundra Bean and taiga bean geese – see section 3.1.2) that were present within the Weybourne area (Fields 21-30). These birds were, in general, present from late November until late January, although relatively few birds were recorded in the first January survey of 2017 (Figure 3.1). The lack of geese in early January did however coincided with large numbers recorded 'in-between

surveys' (during point counts on 9th January) at High Kelling (Field 47). This suggests that the same group of geese formed all the major observations within the survey area.

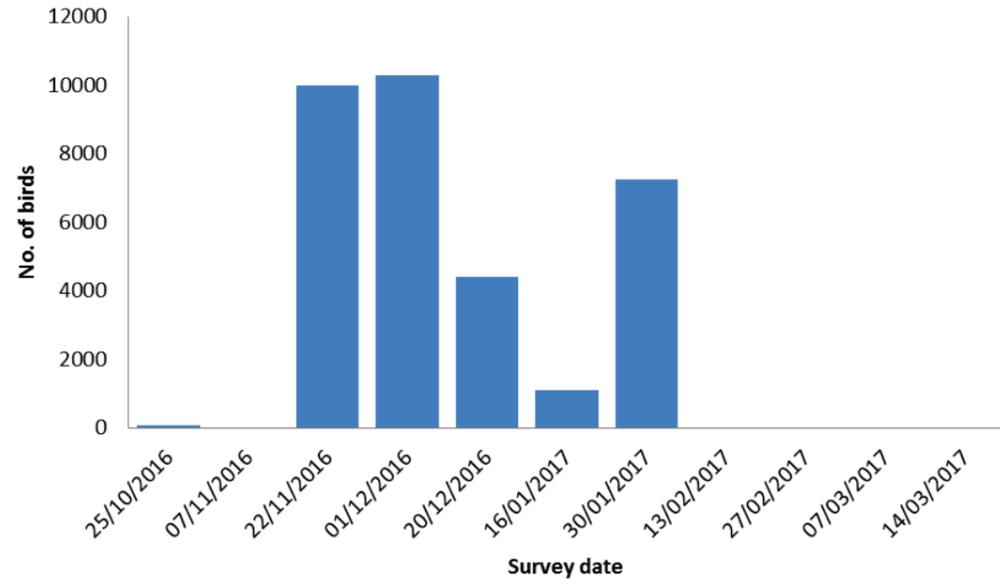


Figure 3.1: Pink-footed goose abundance within functionally linked survey area October 2016 – March 2017.

Figure 3.2 shows an overview of all pink-footed geese records the survey area and also the location of all sugar beet crop recorded. This indicates that the vast majority of geese were focused in the coastal area of Weybourne where almost all fields that held sugar beet crop being utilized at some point in the period. The largest field of sugar beet away from the Weybourne area was Field 47 at High Kelling which was utilized by 9,000 geese in early January 2017. No geese were recorded any further south than Hempstead (Field 169) despite sugar beet being available.

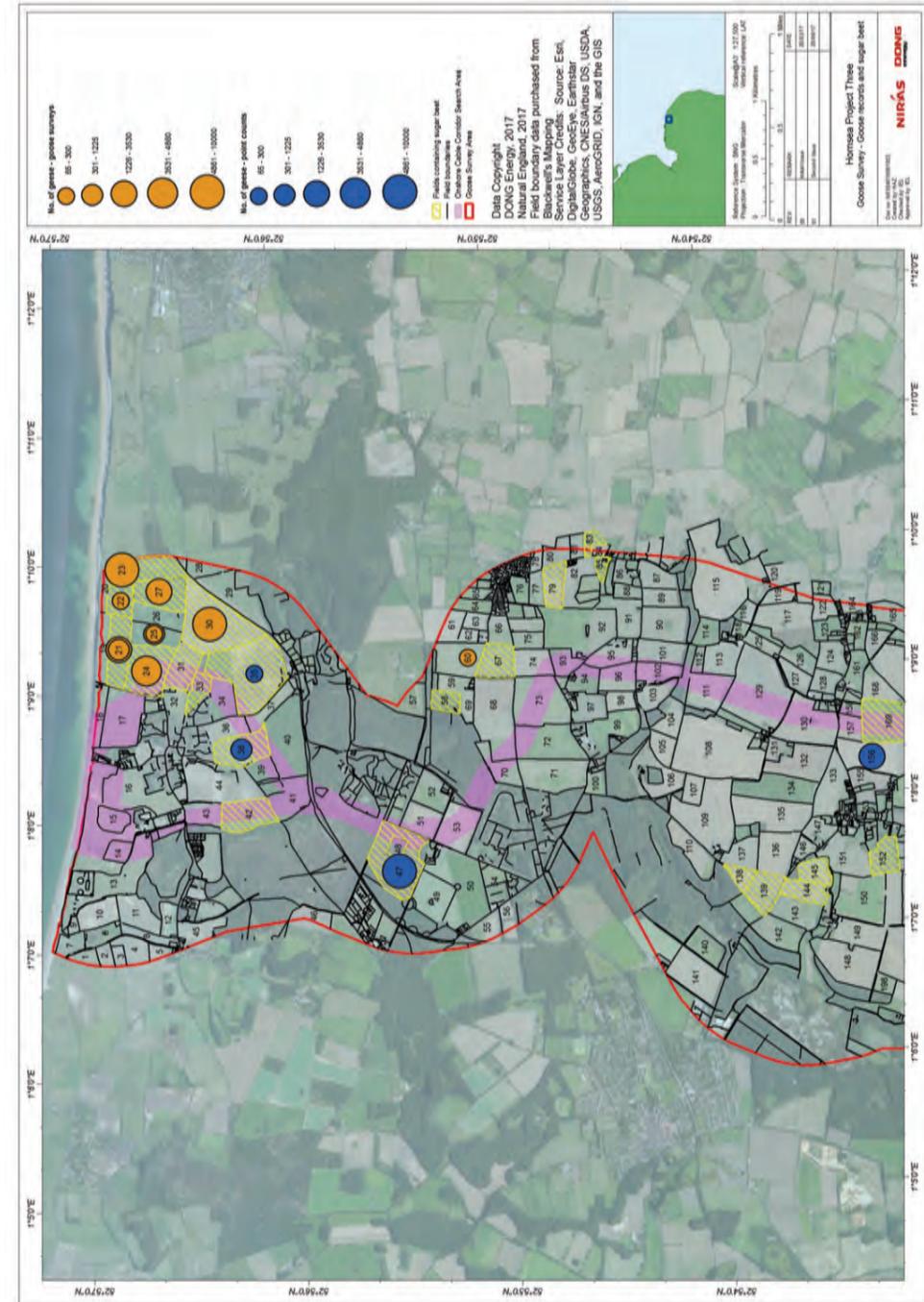


Figure 2.2: Pink-footed goose abundance and distribution October 2016 – March 2017.

3.1.2 Additional species recorded

Species in addition to pink-footed goose that are included as either qualifying or assemblage features of North Norfolk Coast SPA were also recorded during the surveys. Table 3.2 and Table 3.3 provide the results from each survey with respect to these species. Table 3.2 provides counts from a single component of the survey area, Kelling Quags (Water Meadows), an area of coastal wetland. Table 3.3 provides individual records from the remainder of the survey area (Figure 1).

A total of 17 qualifying / assemblage listed species of the SPA were recorded at Kelling Quags, including 12 species not recorded elsewhere in the survey (little egret, Brent goose, shelduck, wigeon, shoveler, pintail, avocet, curlew, black-tailed godwit, redshank, snipe and dunlin). Wigeon was the most abundant species, peaking at 201 birds in late January 2017. Brent goose was recorded on three occasions and were observed to frequent both open water and arable land on the periphery of the Quags. The peak count of this species occurred in early November 2016 when 96 birds were present.

Table 3.2: SPA functionally linked habitat surveys: results for additional species at Kelling Quags

Species ⁴	Survey										
	Oct 1	Nov 1	Nov 2	Dec 1	Dec 2	Jan 1	Jan 2	Feb 1	Feb 2	Mar 1	Mar 2
Little egret			1			1					1
Brent goose		96	23				17				
Shelduck	2	2	2			1		1	2	2	4
Wigeon	40	32	49	10	150	149	201	153	130	110	48
Mallard	4	2	6		3	4	3	4	4	6	2
Teal	18	40	11	10	18	48	9	12	13	8	9
Gadwall	6	4	6			7	2		4	4	10
Shoveler	6	4	2	6	7	2					
Pintail						1					
Avocet										2	
Oystercatcher	2	2				1					
Lapwing	14	11									
Curlew	6	14	34	3	2	18	1	39	44	20	9
Black-tailed godwit						1					
Redshank	5	2					1	2			2
Snipe	3	4	1			1				1	1
Dunlin				2							

Within the survey area outside of Kelling Quags, six qualifying / assemblage features of the SPA were recorded (European white-fronted goose, teal, gadwall, oystercatcher, lapwing and golden plover). Table 3.3 presents these records and also includes records of both subspecies of bean

⁴ Appendix 6.5 presents scientific names of all species recorded during wintering surveys of Hornsea Three.

goose (tundra *rossicus* and taiga *fabalis*) which although not features of the SPA are nationally scarce and recorded on the surveys associating with pink-footed geese. The winter of 2016/17 saw greater than average of tundra bean geese in particular, winter in East Anglia and the group of 19 recorded at Weybourne on 20th January 2017 is a notable part of the influx. White-fronted geese were also seen associating with pink-footed geese on two occasions at Weybourne (15 on 20th December 2016 and 4 on 30th January 2017), while two individuals were seen in the unusual location of Baconsthorpe Castle on 20th December 2016.

Records of additional waterbird species were restricted to the small waterbodies at Baconsthorpe and Selbrigg, with gadwall being the most regularly recorded species at both locations. Golden plover and lapwing were recorded on only three and four surveys respectively.

Table 3.3: SPA functionally linked habitat surveys: results for additional species within survey area.

Species	Survey date	Field No.	Count
Tundra bean goose	22/11/2016	30	2
	20/12/2016	27	3
	30/01/2017	24	19
Taiga bean goose	22/11/2017	30	2
European white-fronted goose	20/12/2017	27	15
	20/12/2017	118	2
	30/01/2017	24	4
Teal	13/02/2017	118	6
	13/02/2017	147	2
	14/03/2017	118	1
Gadwall	01/12/2016	106	4
	20/12/2016	118	2
	13/02/2017	106	4
	27/02/2017	118	14
	07/03/2017	118	8
Oystercatcher	14/03/2017	118	20
	27/02/2017	16	6
	14/03/2017	14	2
Golden plover	14/03/2017	118	2
	22/11/2016	96	50
	13/02/2017	35	45
Lapwing	27/02/2017	195	5
	07/11/2016	96	14
	20/12/2016	92	10
	16/01/2017	301	60
	30/01/2017	302	92

3.2 Permanent land take

3.2.1 Onshore HVAC booster station

The onshore HVAC booster station covers an area of 0.40 km² and is located east of Edgefield Street where part of its eastern boundary directly borders the New Covert County Wildlife Site.

Table 3.4 details the species of conservation interest that were recorded during the four wintering survey visits at the onshore HVAC booster station. A total of 51 species of birds were recorded and of these, twenty-four are of some conservation value.

Two species recorded, red kite and golden plover are listed on Annex 1 of the EU Birds Directive (red kite is also listed on Schedule 1 of the Wildlife & Countryside Act (1981 as amended)). Single individuals of both of these species were recorded, with the golden plover seen in December 2016 and the red kite in March 2017.

Fifteen further Species of Principal Importance (under Section 41 of the NERC Act) or Red listed within Birds of Conservation Concern (Eaton et al., 2015) were recorded. The majority of these species; grey partridge, lapwing, woodcock, marsh tit, skylark, starling, song thrush, dunnock, bullfinch, linnet, lesser redpoll and yellowhammer are fairly widespread species in Norfolk during the winter (albeit suffering some decline).. Also recorded in this area were pink-footed geese on sugar beet (1,325 individuals in November 2016) in addition to five white-fronted geese in January 2017 (see section 3.1.1.).

Table 3.4 Species of conservation interest record during wintering surveys at the onshore HVAC booster station

Species	Status					Survey			
	Annex 1	Sched.1	Section 41	BoCC Red	BoCC Amber	1	2	3	4
Pink-footed goose					X	1,325	0	0	0
European white-fronted goose			X	X		0	5	0	0
Grey partridge			X	X		0	1	2	0
Red kite	X	X				0	0	0	1
Golden plover	X					0	1	0	0
Lapwing			X	X		0	8	81	0
Woodcock				X		0	1	0	0
Black-headed gull					X	3	1,031	372	72
Common gull					X	5	1	8	17
Lesser black-backed gull					X	0	0	2	0
Herring gull			X	X		1	41	10	1
Stock dove					X	0	1	11	1
Kestrel					X	1	0	1	1

Species	Status					Survey			
	Annex 1	Sched.1	Section 41	BoCC Red	BoCC Amber	1	2	3	4
Marsh tit			X	X		4	3	0	2
Skylark			X	X		17	11	7	6
Starling			X	X		0	606	43	36
Song thrush			X	X		0	3	3	2
Redwing		X		X		3	0	0	0
Dunnock			X		X	3	2	15	7
Meadow pipit					X	2	0	1	0
Bullfinch			X		X	2	0	0	0
Linnet			X	X		0	0	0	1
Lesser redpoll			X	X		0	0	0	1
Yellowhammer			X	X		6	6	9	2

3.2.2 Onshore HVDC Converter / HVAC Substation

The onshore Substation covers an area of 0.26 km² and is located to the north-east of Swardeston.

Table 3.5 details the species of conservation interest that were recorded during the four wintering survey visits. A total of 41 species of birds were recorded and of these, seventeen are of some conservation value.

No species recorded are listed on Annex 1 of the EU Birds Directive, while only redwing, fieldfare and brambling are found on Schedule 1 of the Wildlife & Countryside Act (1981 as amended). All of these species are widespread and common winter migrants in Norfolk.

Eleven further Species of Principal Importance (under Section 41 of the NERC Act) or those Red listed within Birds of Conservation Concern (Eaton et al., 2015) were recorded. The majority of these species; grey partridge, lapwing, skylark, starling, song thrush, dunnock, bullfinch, linnet, reed bunting and yellowhammer are again, widespread wintering species in Norfolk typically found in arable or woodland edge habitats that are present at the onshore HVAC converter / HVAC substation.

Table 3.5 Species of conservation interest record during wintering surveys at the onshore HVAC converter / HVAC substation.

Species	Status					Survey			
	Annex 1	Sched.1	Section 41	BoCC Red	BoCC Amber	1	2	3	4
Greylag Goose					X	1	0	0	0
Grey Partridge			X	X		2	0	0	0
Lapwing			X	X		71	26	0	0
Black-headed Gull					X	28	0	18	2
Common Gull					X	18	5	7	1
Lesser Black-backed Gull					X	0	0	3	1
Herring Gull			X	X		3	2	0	0
Stock Dove					X	22	0	3	0
Skylark			X	X		4	4	8	8
Starling			X	X		6	0	40	0
Fieldfare		X		X		24	4	4	0
Song Thrush			X	X		3	1	3	2
Redwing		X		X		43	0	11	0
Dunnock			X		X	7	7	17	15
Meadow Pipit					X	1	0	0	0
Brambling		X				1	0	0	0
Bullfinch			X		X	0	0	1	0
Linnet			X	X		1	0	0	7
Yellowhammer			X	X		1	12	0	1
Reed Bunting			X		X	2	0	0	8

3.3 Export Cable Route

A total of 83 species were recorded within the wintering point count surveys along the ECR. Of these species, 45 are considered to be of some conservation value (Table 3.6).

3.3.1 Annex 1 and Schedule 1 species

Four species recorded are included on Annex 1 of the EU Birds Directive; Bewick's swan, little egret, red kite and golden plover. Bewick's swan was recorded on a single occasion, at point count 75 at the extreme southern end of the onshore ECR, when 10 birds flew over. No individuals of this species were observed on the ground within the surveys. Little egret was recorded on point count 68, with a single bird present on two occasions. Red kite was recorded at point count 27 only, close to Edgefield, which reflects the records obtained for this species during surveys of the onshore HVAC booster station site in this area (see section 3.2). Golden plover were recorded at eight point counts with a maximum count of 73 birds at point count 13 near High Kelling. Other golden plover records were concentrated in the northern half of the onshore ECR and no individuals were recorded south of Attlebridge.

Five additional species recorded during the onshore ECR surveys are listed on Schedule 1 of the Wildlife and Countryside Act: barn owl, Cetti's warbler, redwing, fieldfare and brambling. The latter three species, as detailed earlier in this report, are widespread and common winter migrants to Norfolk and are not discussed further. A single barn owl was recorded at point count 31, while a singing Cetti's Warbler was at point count 4 at Beach Lane, Weybourne (a County Wildlife Site and known location for this species).

3.3.2 Species of Principal Importance / Red List species

Nineteen further species recorded throughout the onshore ECR are Species of Principal Importance and/or Red Listed under Birds of Conservation Concern.

Grey partridge were recorded on two point counts, one of which was in the High Kelling area.

Three species of relevant shorebird were recorded: lapwing, curlew and woodcock. Lapwing were fairly widespread, being recorded at thirteen point counts with a maximum count of 380 birds at point count 31. Lapwings were most often encountered in the northern half of the ECR in point count locations close to the landfall, High Kelling and Edgefield. Conversely, curlew were recorded on a single point count only where twelve birds were found from point count 3 at the landfall. Single woodcock were seen at point counts 5 and 41.

The only red listed species of gull recorded was herring gull, which was widespread and often common throughout the ECR. The peak count for this species was 540 birds at point count 31.

Passerine species associated with woodland or woodland edge that are red listed or species of principal importance involved marsh tit, song thrush, mistle thrush, dunnock, bullfinch and redpoll. Marsh tits were recorded at six point counts in small numbers principally in the High Kelling / Edgefield area but were also found further south in the onshore ECR near Attlebridge and Swardeston. Dunnock and song thrush were commonly recorded in small numbers throughout the onshore ECR while mistle thrush was recorded at seven point counts. Bullfinch was also widespread in the onshore ECR while redpoll was less commonly encountered with only five point counts having records of this species.

Passerine species associated with farmland that are red listed or species of principal importance involved skylark, tree sparrow, linnet, yellowhammer and reed bunting. Skylark and linnet were widespread and often abundant throughout the onshore ECR– a peak count of 11 skylark occurred at point count 12 while 57 linnet occurred at point count 27. Tree sparrow was scarce during the surveys and only recorded at two point counts: 39 (near Heydon) and 46 (near Swannington) where 12 birds were seen. Yellowhammer were commonly encountered in the ECR and often associated with game cover strips with a peak count of 41 birds at point count 69. Reed bunting was scarce during the surveys and recorded at only one point count (13).

Starling was often abundant during the surveys and records were distributed throughout the onshore ECR. A peak count of 232 birds occurred at point count 31. House Sparrow however were only recorded at five point counts and never in any substantial numbers.

Table 3.6 Wintering bird survey of the Hornsea Three onshore export cable route search area – point count results

Species	Conservation Status				Point Counts	Peak abundance
	Annex 1	Sched.1	Section 41	BocC Red BocC Amber		
Mute swan				X	44, 45, 49, 57	2 (#'s 44, 45, 57)
Bewick's swan	X	X	X	X	75	10 (# 75)
Bean goose (<i>rossicus</i>)				X	7	2 (# 7)
Pink-footed goose				X	1, 2, 4, 6-13, 20, 58, 61	9,004 (# 11)
Grey/lag goose				X	19, 32, 41, 46, 55, 57, 59, 61	34 (# 19)
Wigeon				X	59	36 (# 59)
Teal				X	59	2 (# 59)
Mallard				X	3, 19, 31, 41, 59, 62	3 (# 3, 59, 62)
Grey partridge		X	X	X	13, 65	1 (#'s 13, 65)
Little egret	X				68	1 (# 68)
Red kite	X	X			27	1 (# 27)
Oystercatcher				X	1-4, 32, 59	8 (# 2)
Golden plover	X				13, 35, 36, 45, 46	73 (# 13)
Lapwing		X	X		3, 7, 11-13, 31-35, 43, 44, 59, 60	380 (# 31)
Curlew		X	X		3	12 (# 3)
Turnstone				X	1, 3, 4	4 (# 4)
Woodcock			X		5, 41	1 (#'s 5, 41)
Black-headed gull				X	1-38, 40-47, 49-71, 76, 78	850 (# 53)
Common gull				X	1, 3, 6, 7, 13, 19, 20, 27, 28, 31, 32, 34-38, 41-53, 55-65, 68, 69, 75, 76, 78	250 (# 53)
Lesser black-backed gull				X	1, 2, 4, 8-10, 16, 33, 44, 53, 60, 62, 66, 67, 71, 76	3 (# 2)
Herring gull		X	X		1-4, 10-13, 19, 20, 28, 31, 32, 34-36, 43, 44, 46, 47, 53, 54, 57, 60, 62-65, 69, 75, 76, 78	540 (# 31)
Glaucous gull				X	4	1 (# 4)
Great black-backed gull				X	1, 4, 64	4 (# 4)

Page 19/40

Species	Conservation Status				Point Counts	Peak abundance
	Annex 1	Sched.1	Section 41	BocC Red BocC Amber		
Stock dove				X	3, 7, 8, 13, 19, 31, 32, 35, 40, 51, 55, 56, 59, 62, 63, 68, 75, 78	28 (# 63)
Barn owl		X			31	1 (# 31)
Kestrel				X	1, 2, 4, 10, 13, 20, 23, 27, 38, 40, 42, 47, 49, 51-53, 55, 63-65, 75	1 (# all PC's)
Marsh tit			X		8, 19, 28, 48, 69, 77	2 (# 28)
Skylark			X		1-13, 19, 20, 23, 27, 28, 31, 32, 34-37, 39-47, 50-52, 54-61, 63, 65, 66, 68, 69, 75, 76, 78, 48a	11 (# 12)
Cetti's warbler		X			4	1 (# 4)
Starling		X	X		2, 3, 5, 12, 20, 31-36, 38, 44, 49, 53-63, 69, 75, 76, 78	232 (# 31)
Fieldfare		X	X		10, 20, 38, 39, 41, 43, 46-49, 55, 57-60, 62, 63, 65, 69, 75-78	95 (# 46)
Song thrush		X	X		5, 6, 19, 23, 31, 32, 34, 37, 38, 40, 42, 43, 48, 50, 55, 57, 58, 77, 48a	3 (# 34)
Redwing		X	X		6, 20, 32, 41-43, 47-49, 52, 55-61, 65, 69, 76, 77	60 (# 76)
Mistle thrush			X		5, 11, 27, 38, 43, 47, 50	4 (# 43)
Duncock			X	X	2-8, 10, 11, 13, 19, 20, 23, 27, 28, 31, 32, 34, 36-38, 40, 42-64, 69, 75-78, 48a	4 (#'s 5, 6, 7)
House sparrow			X		6, 20, 40, 46, 62	5 (# 40)
Tree sparrow			X		39, 46	12 (# 46)
Grey wagtail			X		42	1 (# 42)
Meadow pipit				X	2-4, 20, 27, 32, 34, 35, 40, 45, 47, 57, 60, 68	8 (#'s 27, 68)
Brambling		X			54	3 (# 54)
Bullfinch		X		X	5, 8-10, 13, 19, 34, 41, 42, 48, 51, 56, 58, 59, 61, 62, 75, 78	3 (#'s 42, 48, 51, 59)
Linnet		X	X		2, 8, 13, 23, 27, 28, 35-37, 39-42, 44, 46, 47, 49, 51-53, 55-63, 68, 77	57 (# 27)
Lesser redpoll			X		47, 48, 54, 61, 78	10 (# 48)
Yellowhammer			X		6-8, 13, 19, 23, 27, 31, 32, 34, 36, 37, 39, 40, 42-47, 50, 51, 55, 57-61, 63, 69, 78	41 (# 69)
Reed bunting			X		13	1 (# 13)

Page 20/40

4. Summary

Wintering bird surveys recorded 83 species within the wintering point count surveys along the cable route. Of these species, 45 are considered to be of some conservation value. However, with the exception of pink-footed goose, none were considered to occur in particularly significant numbers. The onshore HVAC booster substation and onshore HVDC converter/HVAC substation sites recorded low numbers of species of conservation value, although both supported several wintering species included on the Red List of BoCC.

The impacts on wintering bird species within the onshore ECR search area will be considered in the EIA.

Pink-footed geese were found to use fields within and adjacent to the cable corridor at the north end of the corridor. These birds were, in general, present from late November until late January, on sugar beet fields. The vast majority of geese were focused in the coastal area of Weybourne where almost all fields that held sugar beet crop being utilized at some point in the period. The largest field of sugar beet away from the Weybourne area was High Kelling which was utilized by 9,000 geese in early January 2017. Geese were rarely recorded any further south than Hempstead despite sugar beet being available.

The maximum count of pink-footed geese recorded during the survey was 10,000. This represents 42% of the five-year peak mean count of this species (23,802) from the North Norfolk Coast SPA citation, or 4.45% of the wintering Eastern Greenland/Iceland/UK population.

The assessment of potential impacts on pink-footed geese will take place in both the EIA and Habitat Regulations Assessment Report.

5. References

Brides, K., Mitchell, C. & Hearn R.D. 2013. Mapping the distribution of feeding Pink-footed Geese in England. Wildfowl & Wetlands Trust / Natural England Report, Slimbridge. 44pp.

Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, 708–746. Available online at britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf

Musgrove, A.J., Aebicher, N.J., Eaton, M.A., Hearn, R.D., Newson, S.E., Noble, D.G., Parsons, M., Risely, K. and Stroud, D.A., 2013. Population estimates of birds in Great Britain and the United Kingdom. *British Birds*, 106, pp. 64-100.

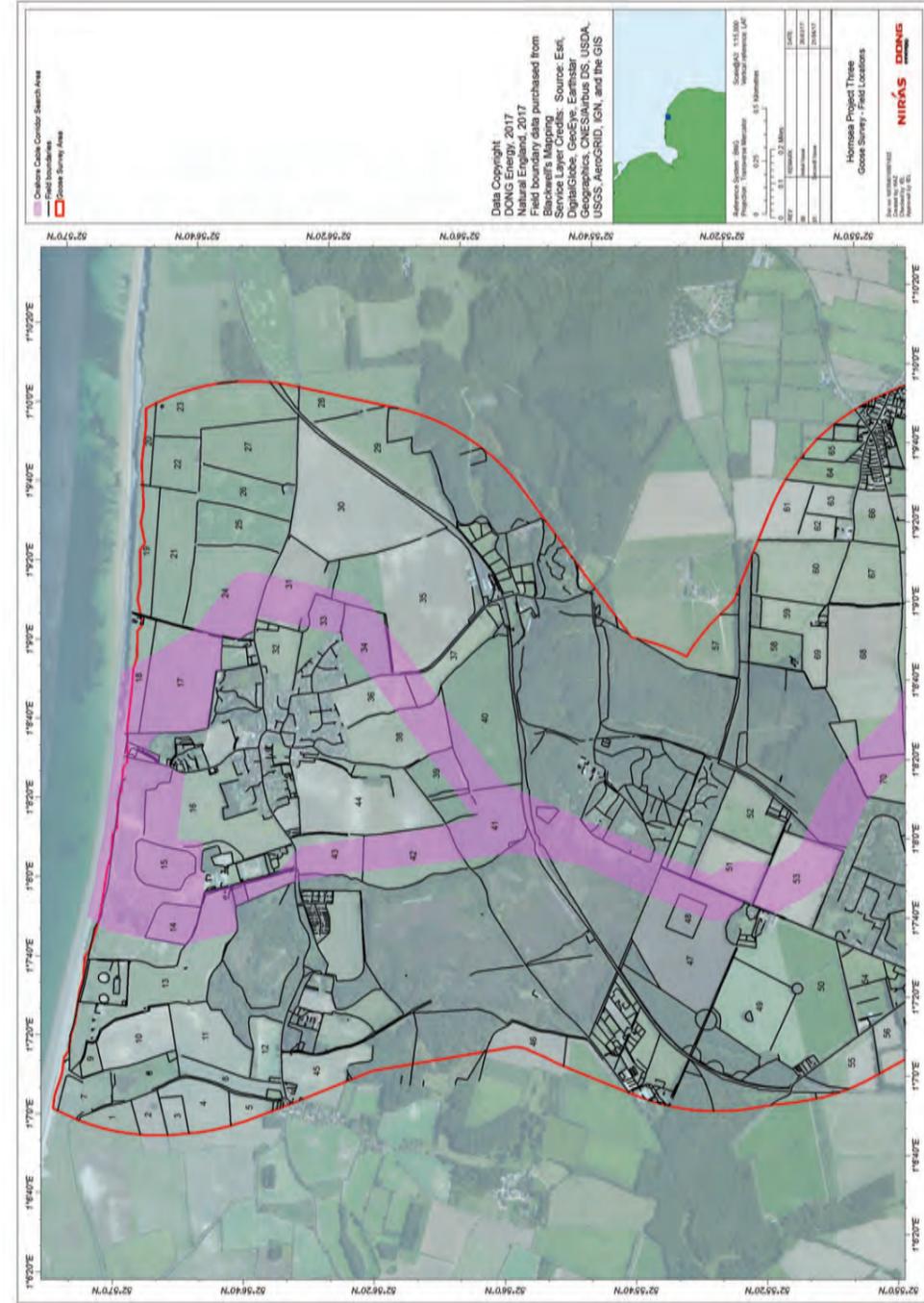
Taylor, M. and Marchant, J.M. 2011. *The Norfolk Bird Atlas: Summer and Winter Distributions 1999-2007*. British Trust for Ornithology, Thetford.

6. Appendices

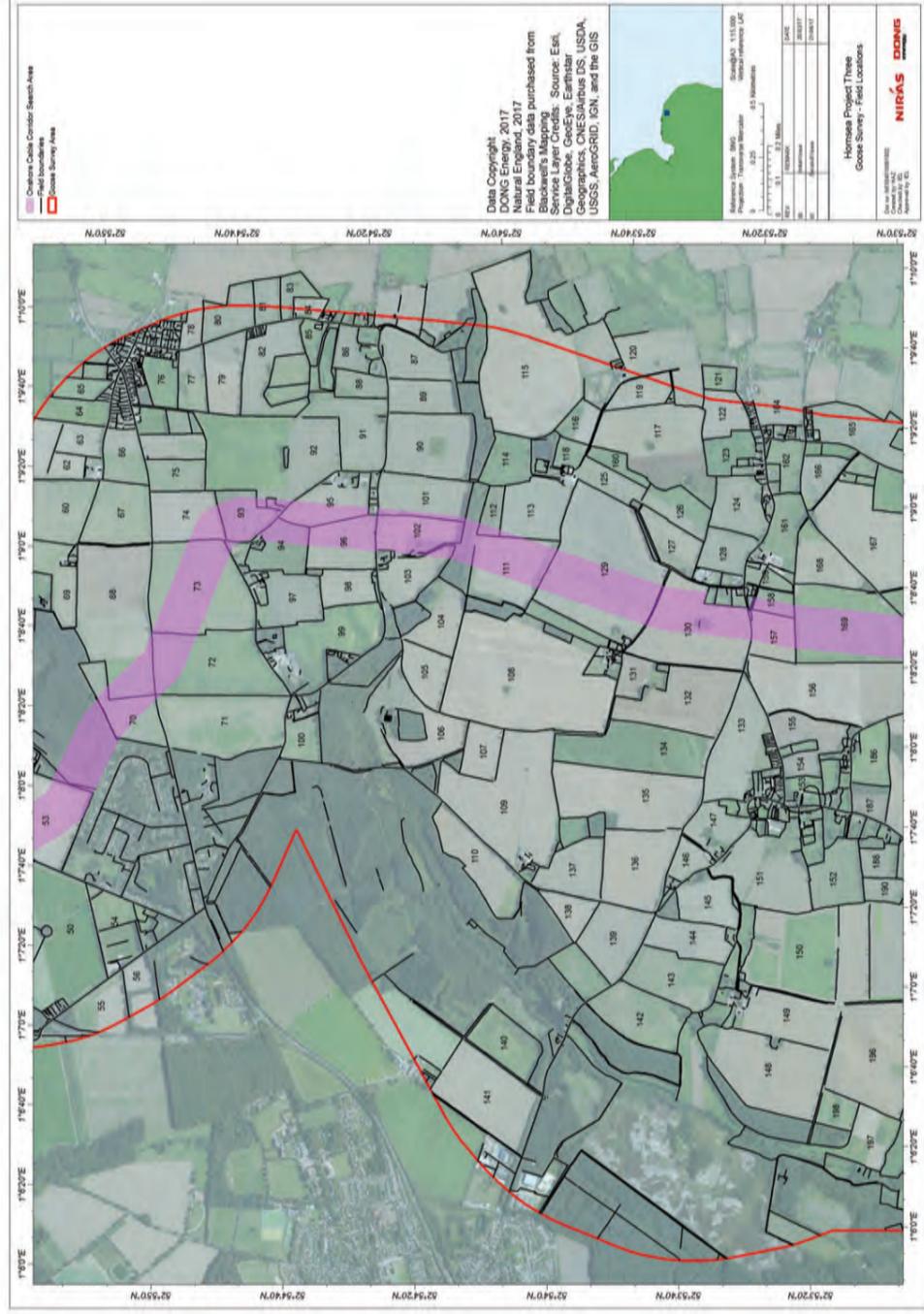
6.1 SPA functionally linked habitat surveys – field locations

Hornsea Three Offshore Wind Farm

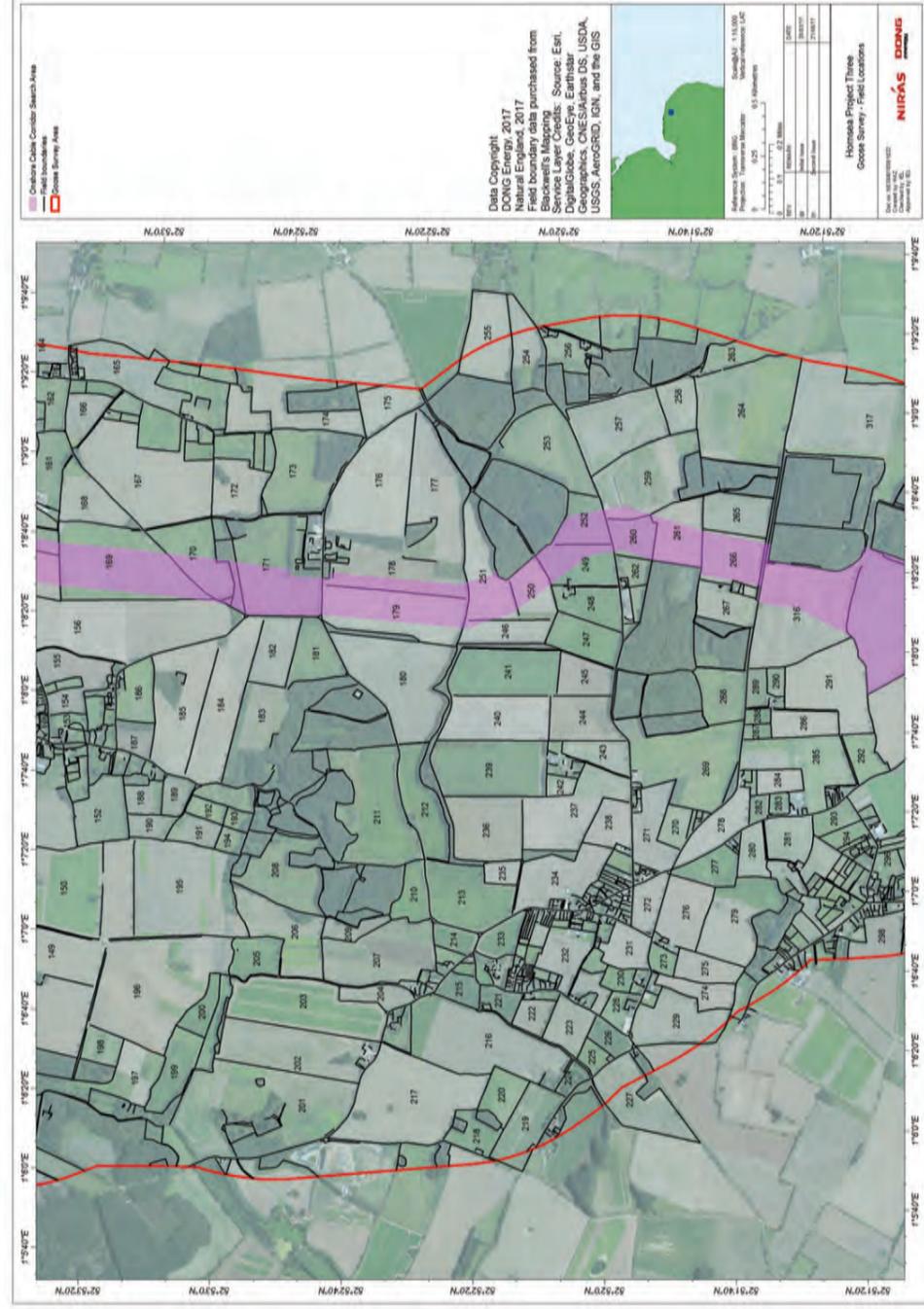
Doc. no. 2832023
Case no. 200-15-3309



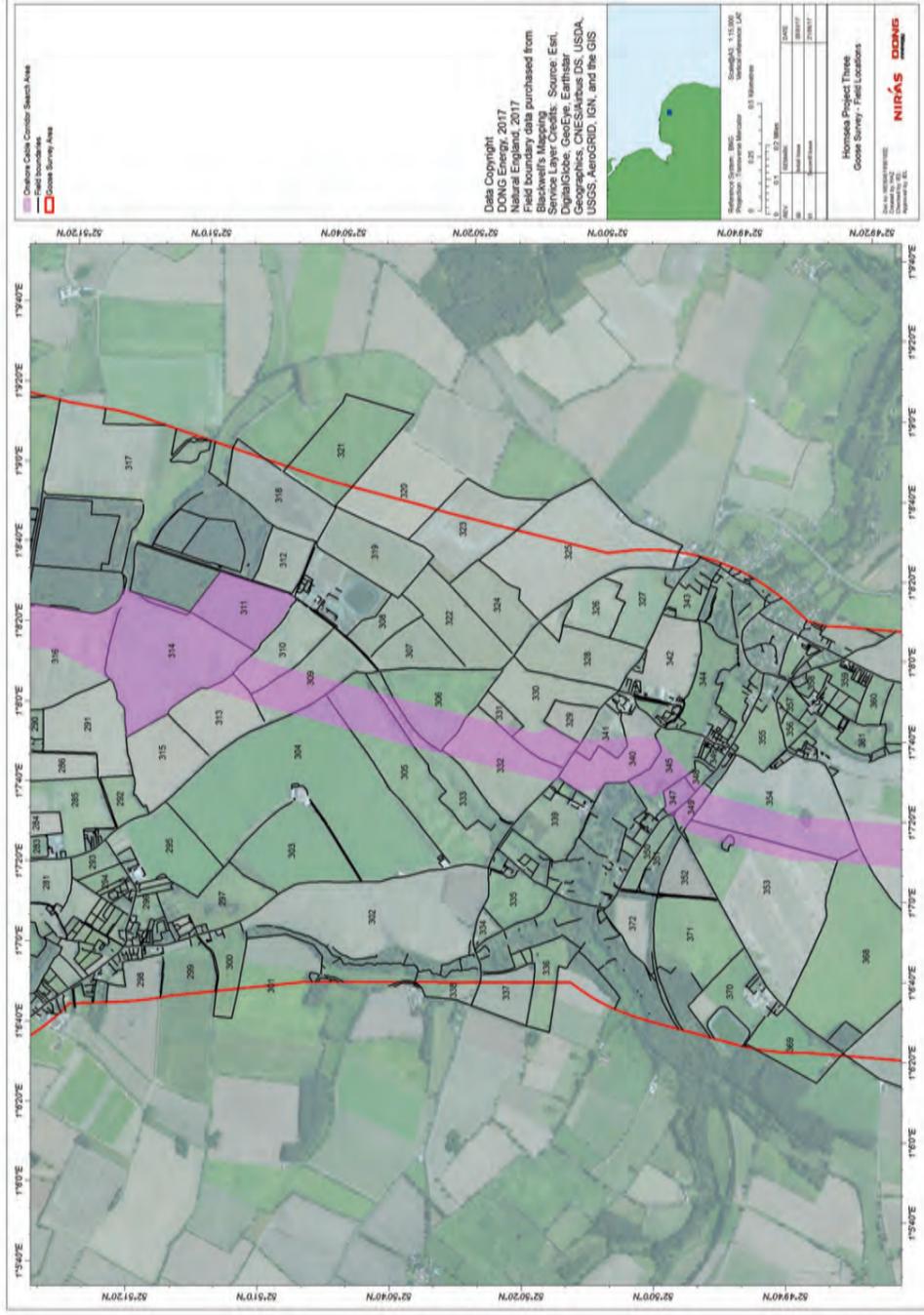
Appendix 6.1a – SPA functionally linked habitat survey field locations part 1.



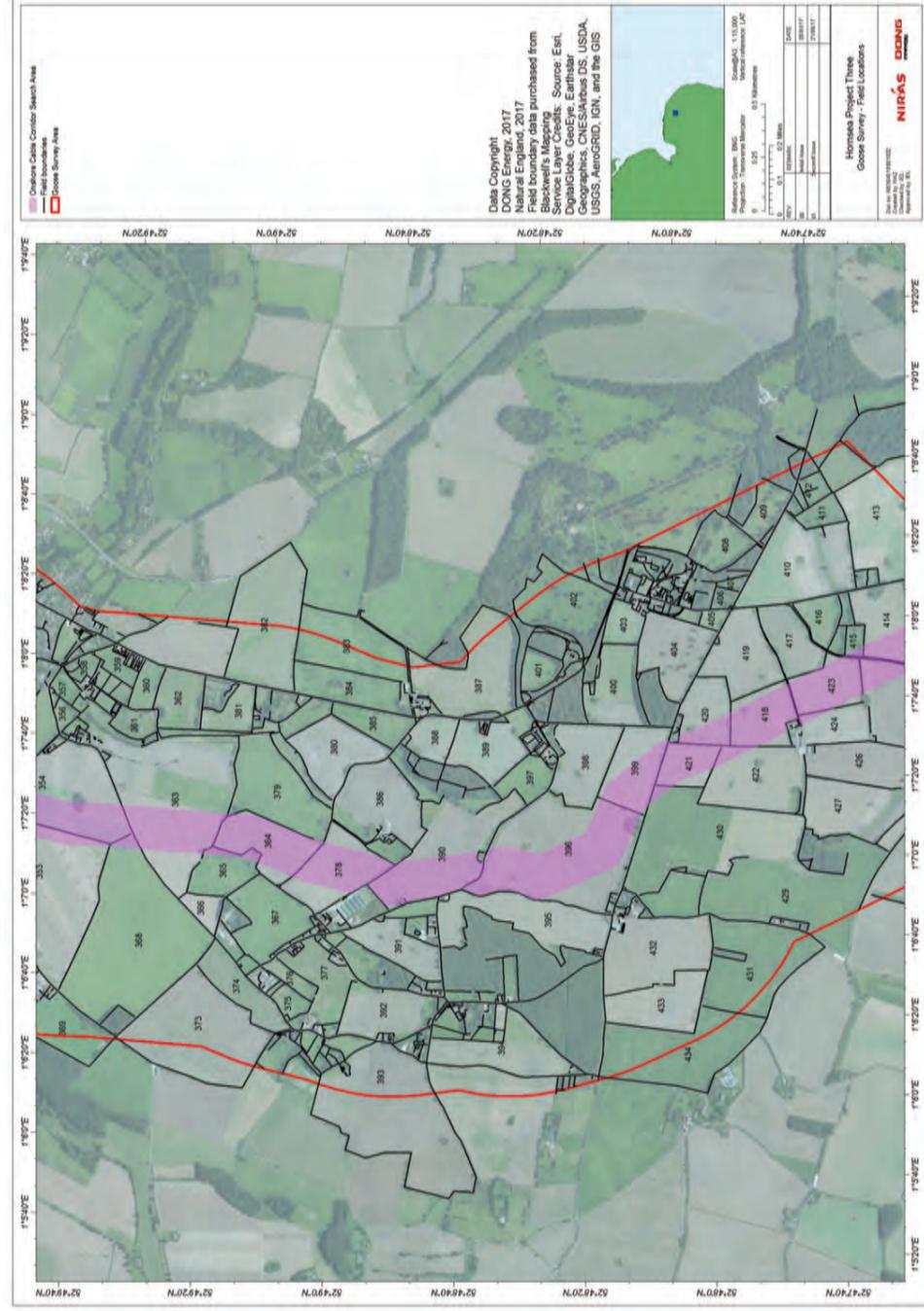
Appendix 6.1b – SPA functionally linked habitat survey field locations part 2.



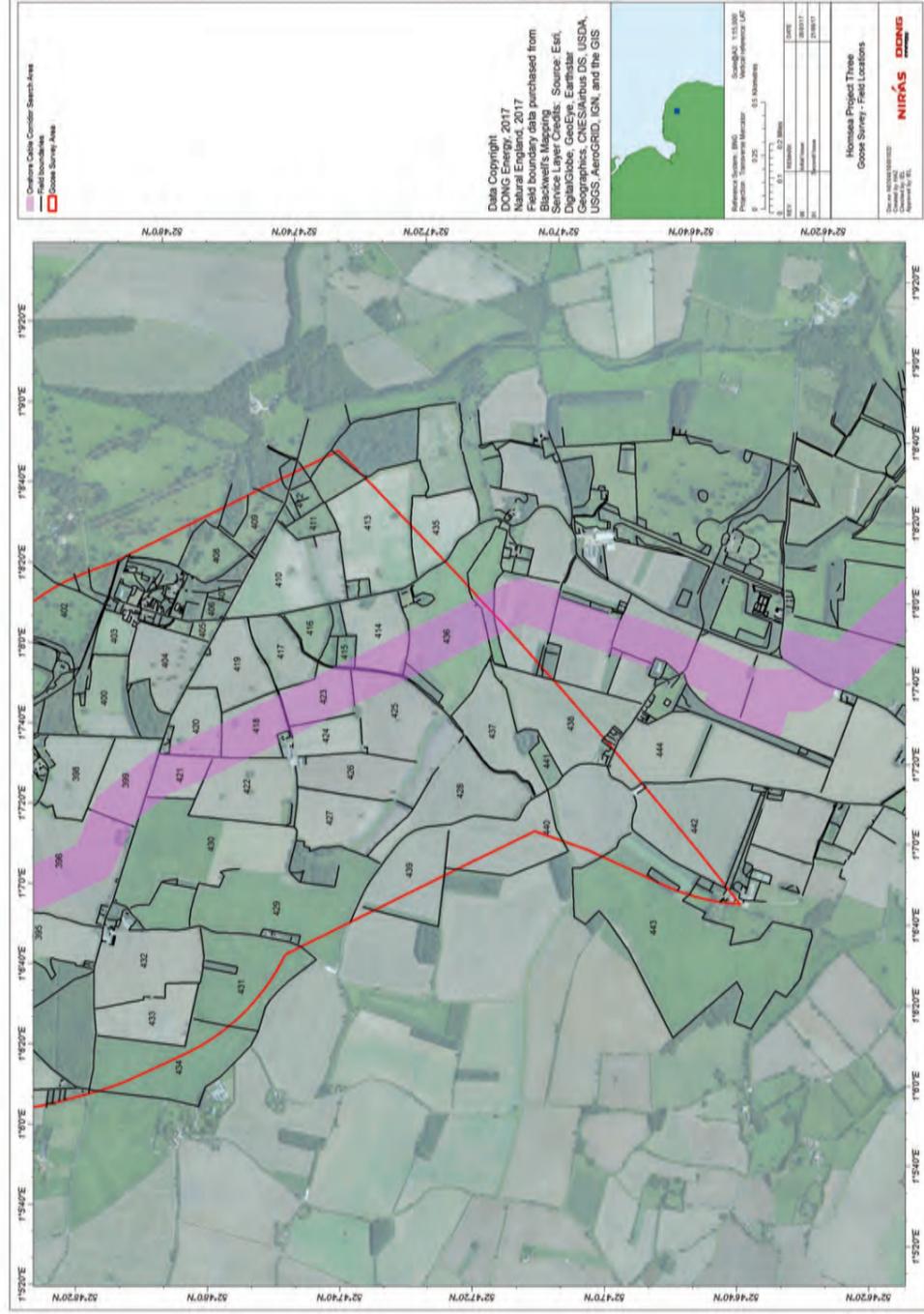
Appendix 6.1c – SPA functionally linked habitat survey field locations part 3.



Appendix 6.1d – SPA functionally linked habitat survey field locations part 4.

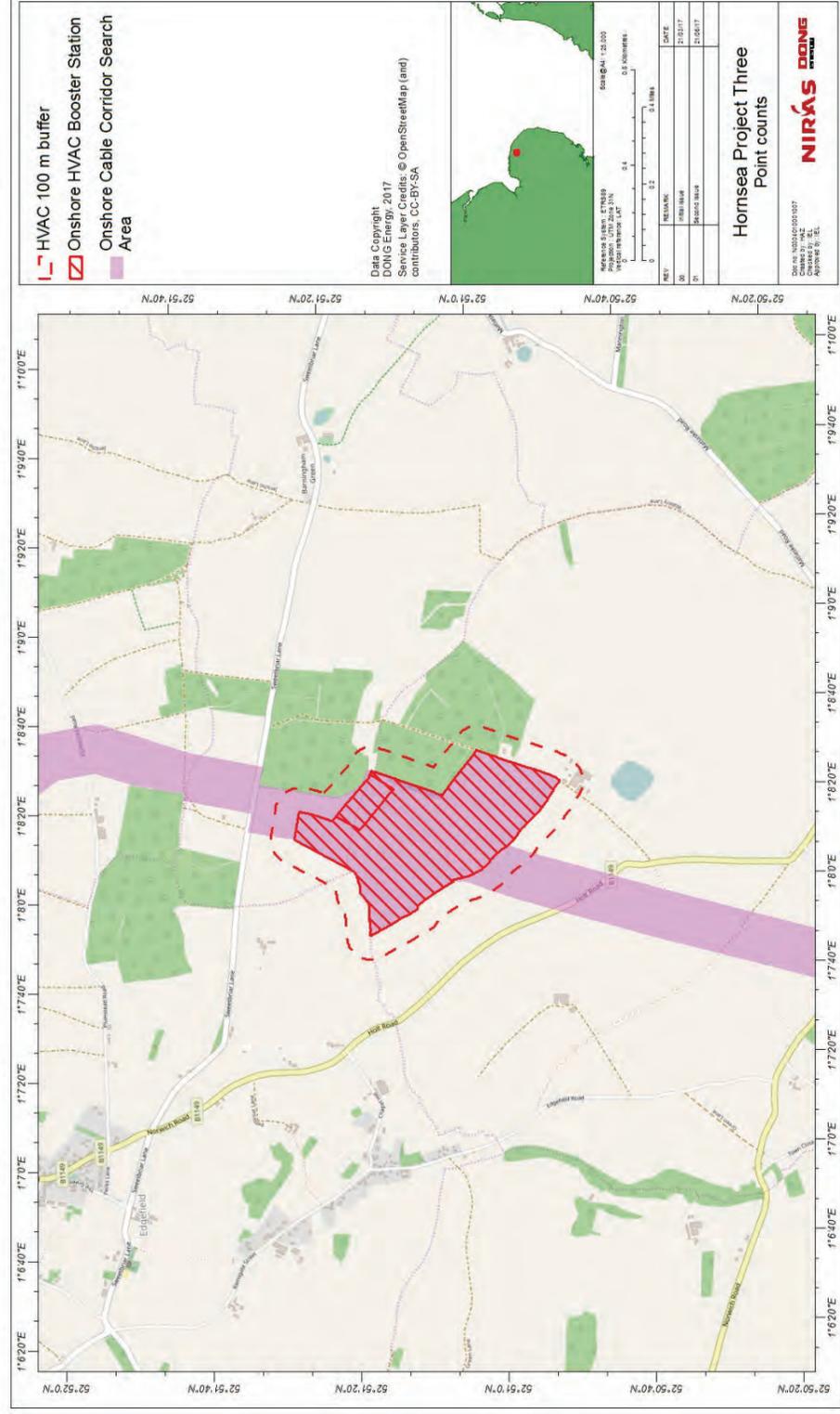


Appendix 6.1e – SPA functionally linked habitat survey field locations part 5.

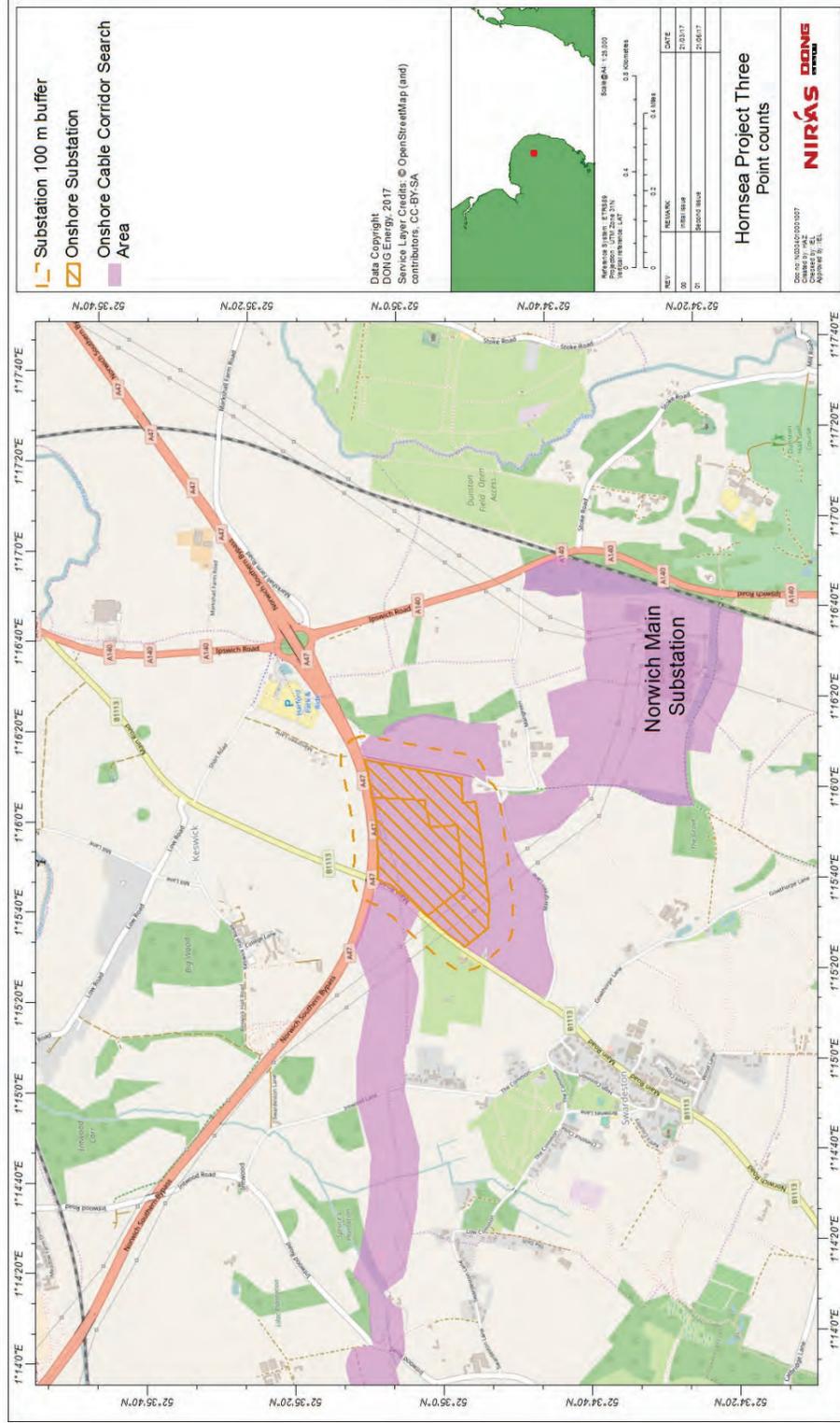


Appendix 6.1f – SPA functionally linked habitat survey field locations part 6.

6.2 Permanent land take locations

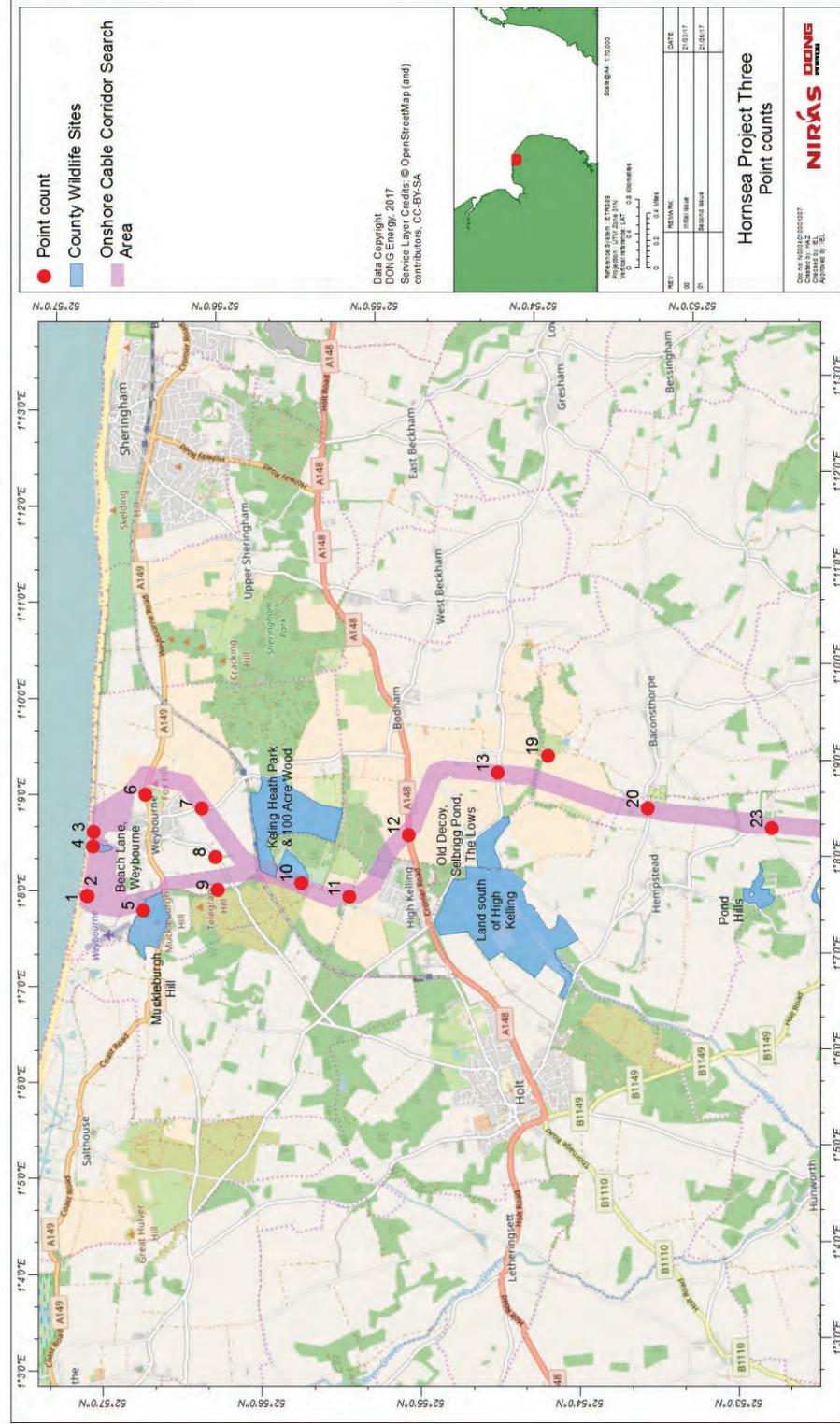


Appendix 6.2a – Survey location of the Onshore HVAC Booster Station.

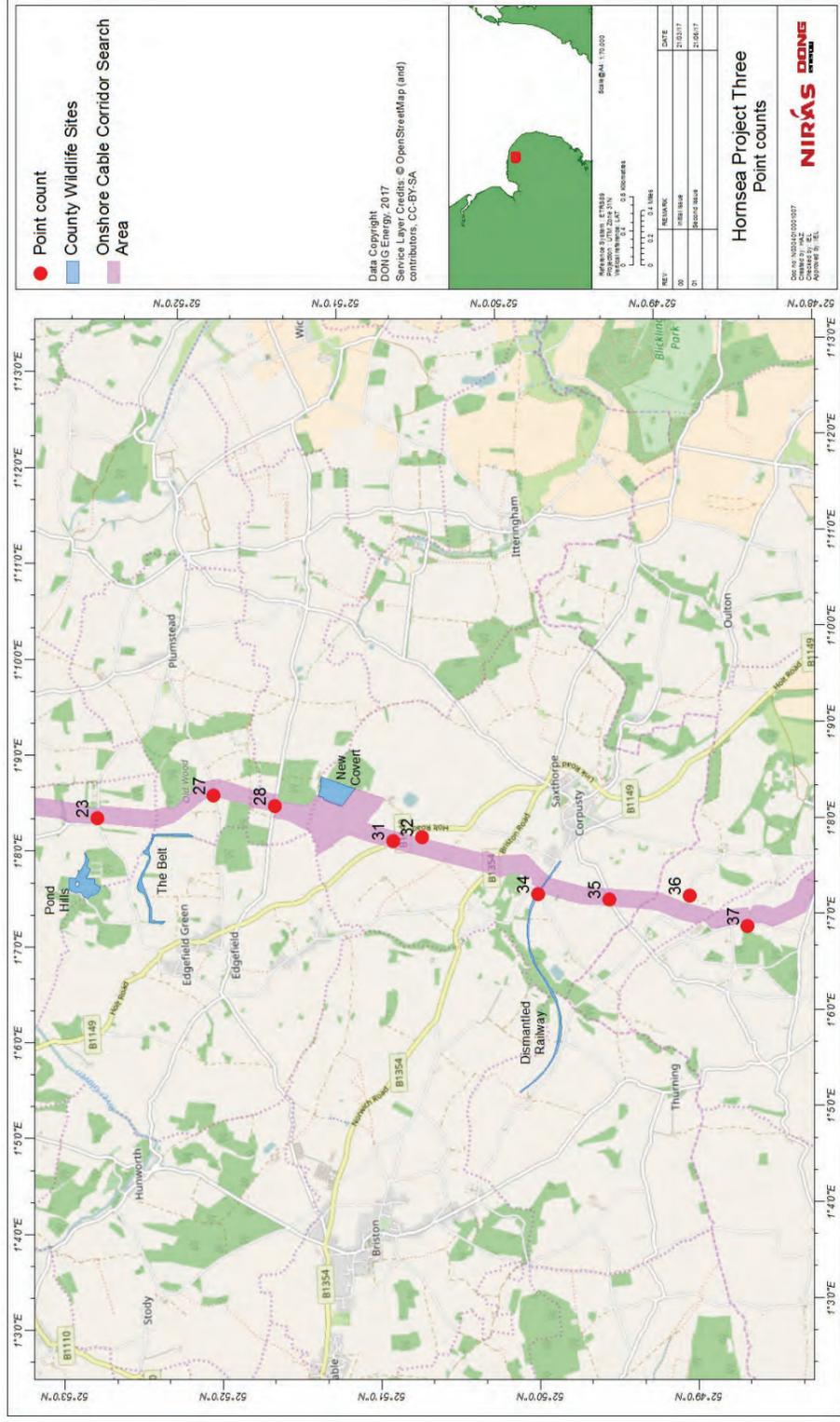


Appendix 6.2b – Survey location of the Onshore HVDC Converter / HVAC Substation.

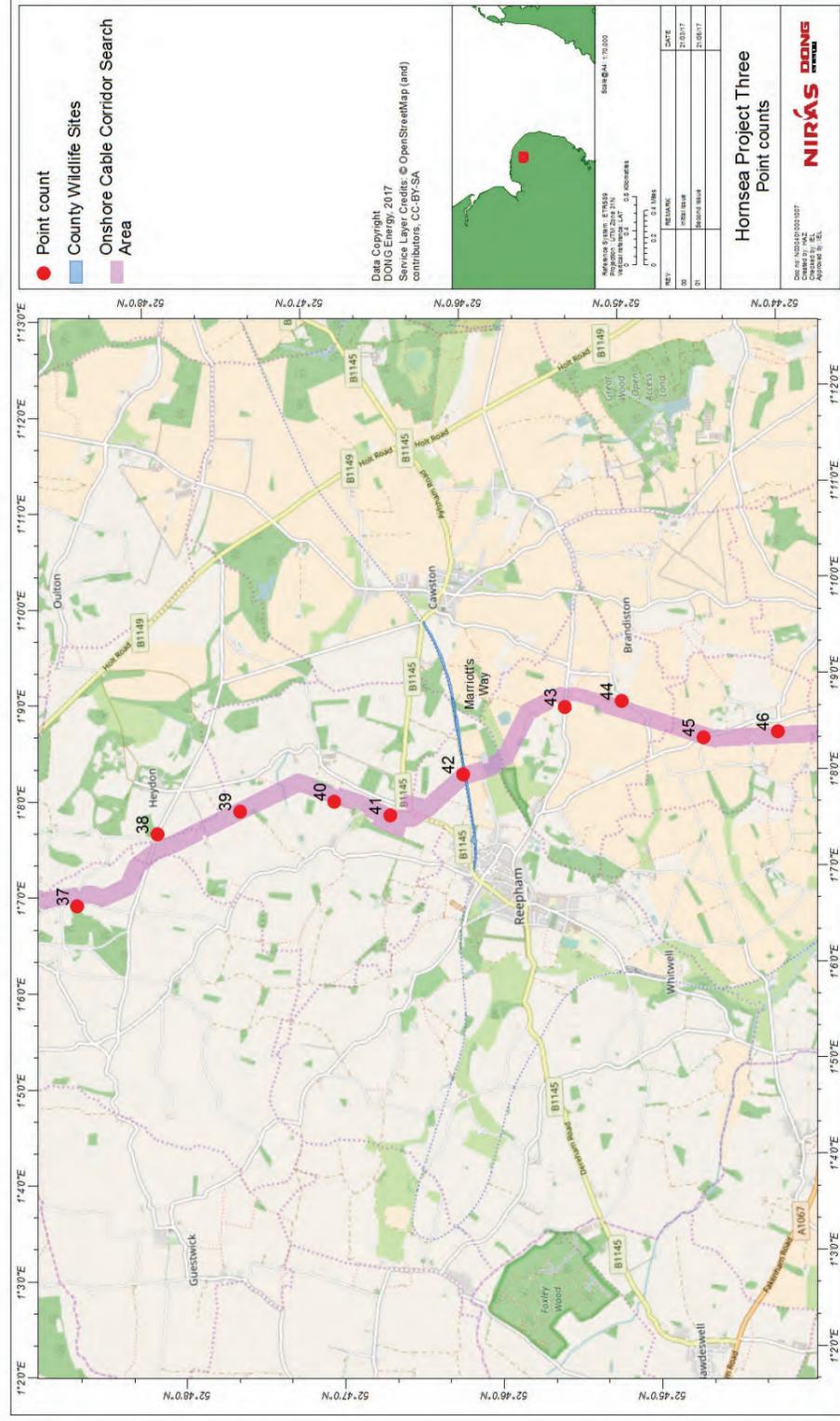
6.3 Export Cable Route Point Counts



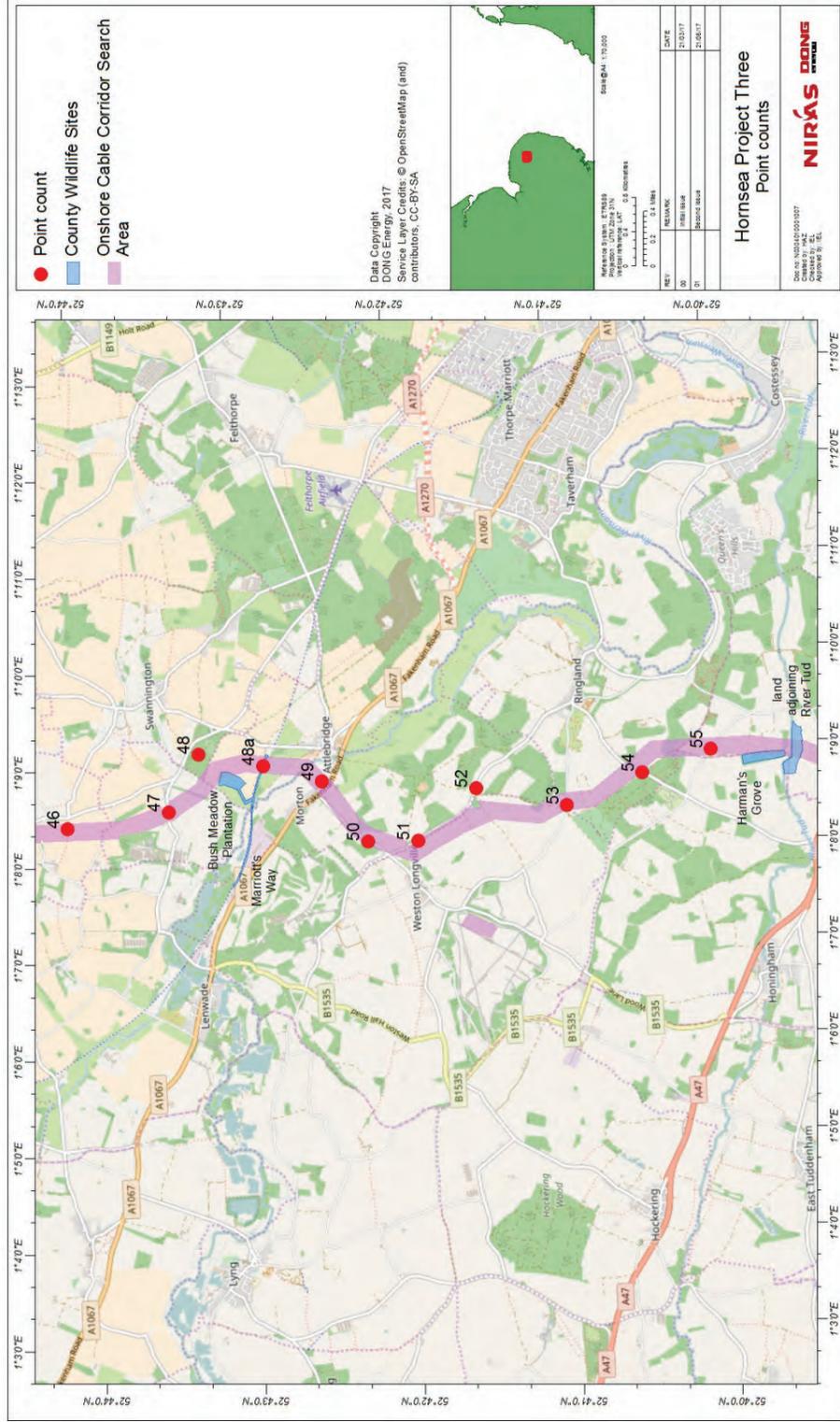
Appendix 6.3a – Point Count Locations part 1.



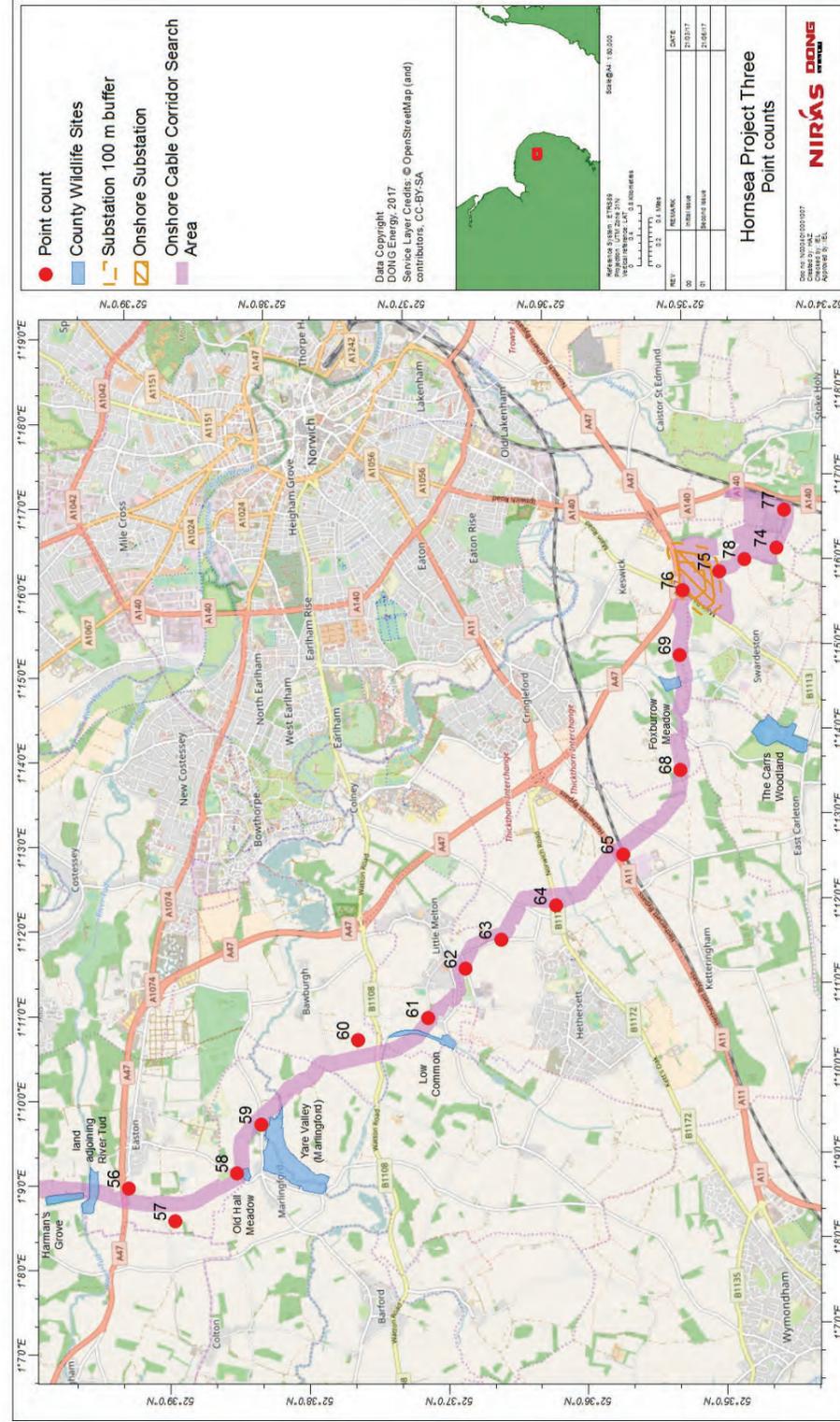
Appendix 6.3b – Point Count locations part 2.



Appendix 6.3c – Point Count locations part 3.



Appendix 6.3d – Point Count locations part 4.



Appendix 6.3e – Point Count locations part 5.

6.4 Reference populations for species of conservation interest

Species	GB wintering population ⁵	NNC SPA cited population ⁶	Norfolk wintering population
Mute swan	74,000		1,500 – 2,500
Bewick's Swan	7,000		3,000 – 5,000
Bean goose	730		140-240 <i>fabelis</i> 20-40 <i>rossicus</i>
Pink-footed goose	360,000	23,802 / 24,979	100,000 – 150,000
White-fronted goose	16,000		900 – 1,400
Greylag goose	220,000		6,000 – 8,000
Brent goose		11,512 / 7,196	8,000 – 10,000
Wigeon	440,000	14,039 / 13,007	30,000 – 50,000
Mallard	680,000		10,000 – 20,000
Grey partridge	43,000		8,000 – 12,000
Little egret	4,500		50 -250
Red kite	1,600		2 - 5
Avocet		252 / 552	200 - 350
Oystercatcher	320,000		8,000 - 9,000
Golden plover	400,000		35,000 – 50,000
Lapwing	620,000		40,000 – 50,000
Curlew	140,000		5,000 – 6,000
Turnstone	51,000		1,000 – 1,500
Woodcock	1,400,000		5,000 – 10,000
Black-headed gull	2,200,000		70,000 – 90,000
Common gull	700,000		15,000 – 25,000
Lesser black-backed gull	120,000		8,000 – 12,000

⁵ Musgrove et al. (2013)]

* GB breeding population (wintering population not available in Musgrove et al. 2013)

⁶ Figures taken from (i) Standard Natura 2000 Data form (<http://jncc.defra.gov.uk/pdf/SPA/UK9009031.pdf>) and (ii) 2016 SPA Review (<http://jncc.defra.gov.uk/page-7309>)

Species	GB wintering population ⁵	NNC SPA cited population ⁶	Norfolk wintering population
Herring Gull	730,000		8,000 – 12,000
Glaucous gull	n/a		1 - 15
Great black-backed gull	76,000		700 – 1,000
Stock dove	520,000*		15,000 – 20,000
Barn owl	8,000*		1,000 – 1,500
Kestrel	90,000*		2,000 – 3,000
Marsh tit	82,000*		3,000 – 5,000
Skylark	2,800,000*		60,000 – 80,000
Starling	3,600,000		250,000 – 280,000
Fieldfare	680,000		40,000 – 50,000
Song thrush	2,200,000*		15,000 – 20,000
Redwing	650,000		10,000 – 15,000
Mistle thrush	320,000*		8,000 – 10,000
Duncock	4,600,000*		50,000 – 60,000
House sparrow	10,200,000*		90,000 – 120,000
Tree sparrow	360,000*		2,000 – 2,500
Grey wagtail	70,000*		150 - 200
Meadow pipit	3,800,000*		15,000 – 20,000
Brambling	45,000		2,000 – 5,000
Bullfinch	380,000*		4,000 – 5,000
Linnet	820,000*		18,000 – 22,000
Lesser Redpoll	380,000*		2,000 – 4,000
Yellowhammer	1,400,000*		25,000 – 35,000
Reed Bunting	460,000*		7,000 – 10,000

6.5 Systematic list of all species recorded in Export Cable Route and permanent land take surveys

Species	Scientific name
Mute Swan	<i>Cygnus olor</i>
Bewick's Swan	<i>Cygnus bewickii</i>
Bean Goose	<i>Anser fabalis</i>
Pink-footed Goose	<i>Anser brachyrhynchus</i>
White-fronted Goose	<i>Anser albifrons</i>
Greylag Goose	<i>Anser anser</i>
Canada Goose	<i>Branta canadensis</i>
Egyptian Goose	<i>Alopochen aegyptiaca</i>
Wigeon	<i>Mareca penelope</i>
Teal	<i>Querquedula crecca</i>
Mallard	<i>Anas platyrhynchos</i>
Red-legged Partridge	<i>Alectoris rufa</i>
Grey Partridge	<i>Perdix perdix</i>
Pheasant	<i>Phasianus colchicus</i>
Cormorant	<i>Phalacrocorax carbo</i>
Little Egret	<i>Egretta garzetta</i>
Grey Heron	<i>Ardea cinerea</i>
Red Kite	<i>Milvus milvus</i>
Marsh Harrier	<i>Circus aeruginosus</i>
Sparrowhawk	<i>Accipiter nisus</i>
Buzzard	<i>Buteo buteo</i>
Water Rail	<i>Rallus aquaticus</i>
Moorhen	<i>Gallinula chloropus</i>
Coot	<i>Fulica atra</i>
Oystercatcher	<i>Haematopus ostralegus</i>
Golden Plover	<i>Pluvialis apricarius</i>
Lapwing	<i>Vanellus vanellus</i>
Curlew	<i>Numenius arquata</i>
Turnstone	<i>Arenaria interpres</i>
Woodcock	<i>Scolopax rusticola</i>
Black-headed Gull	<i>Larus ridibundus</i>
Common Gull	<i>Larus canus</i>
Lesser Black-backed Gull	<i>Larus fuscus</i>
Herring Gull	<i>Larus argentatus</i>
Glaucous Gull	<i>Larus hyperboreus</i>
Great Black-backed Gull	<i>Larus marinus</i>
Feral pigeon	<i>Columba livia</i>
Stock Dove	<i>Columba oenas</i>
Woodpigeon	<i>Columba palumbus</i>
Collared Dove	<i>Streptopelia decaocto</i>
Barn Owl	<i>Tyto alba</i>
Little Owl	<i>Carine noctua</i>
Green Woodpecker	<i>Picus viridis</i>

Species	Scientific name
Great Spotted Woodpecker	<i>Dryobates major</i>
Kestrel	<i>Falco tinnunculus</i>
Magpie	<i>Pica pica</i>
Jay	<i>Garrulus glandarius</i>
Jackdaw	<i>Corvus monedula</i>
Rook	<i>Corvus frugilegus</i>
Carrion Crow	<i>Corvus corone</i>
Goldcrest	<i>Regulus regulus</i>
Blue Tit	<i>Parus caeruleus</i>
Great Tit	<i>Parus major</i>
Coal Tit	<i>Parus ater</i>
Marsh Tit	<i>Parus palustris</i>
Skylark	<i>Alauda arvensis</i>
Cetti's Warbler	<i>Cettia cetti</i>
Long-tailed Tit	<i>Aegithalos caudatus</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Nuthatch	<i>Sitta europaea</i>
Treecreeper	<i>Certhia familiaris</i>
Wren	<i>Troglodytes troglodytes</i>
Starling	<i>Sturnus vulgaris</i>
Blackbird	<i>Turdus merula</i>
Fieldfare	<i>Turdus pilaris</i>
Song Thrush	<i>Turdus philomelos</i>
Redwing	<i>Turdus musicus</i>
Mistle Thrush	<i>Turdus viscivorus</i>
Robin	<i>Erithacus rubecula</i>
Stonechat	<i>Saxicola torquatus</i>
Duncock	<i>Prunella modularis</i>
House Sparrow	<i>Passer domesticus</i>
Tree Sparrow	<i>Passer montanus</i>
Grey Wagtail	<i>Motacilla cinerea</i>
Pied Wagtail	<i>Motacilla alba</i>
Meadow Pipit	<i>Anthus pratensis</i>
Brambling	<i>Fringilla montifringilla</i>
Chaffinch	<i>Fringilla coelebs</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Greenfinch	<i>Carduelis chloris</i>
Linnet	<i>Acanthis cannabina</i>
Lesser Redpoll	<i>Acanthis linaria cabaret</i>
Goldfinch	<i>Carduelis carduelis</i>
Siskin	<i>Spinus spinus</i>
Yellowhammer	<i>Emberiza citrinella</i>
Reed Bunting	<i>Emberiza schoeniclus</i>