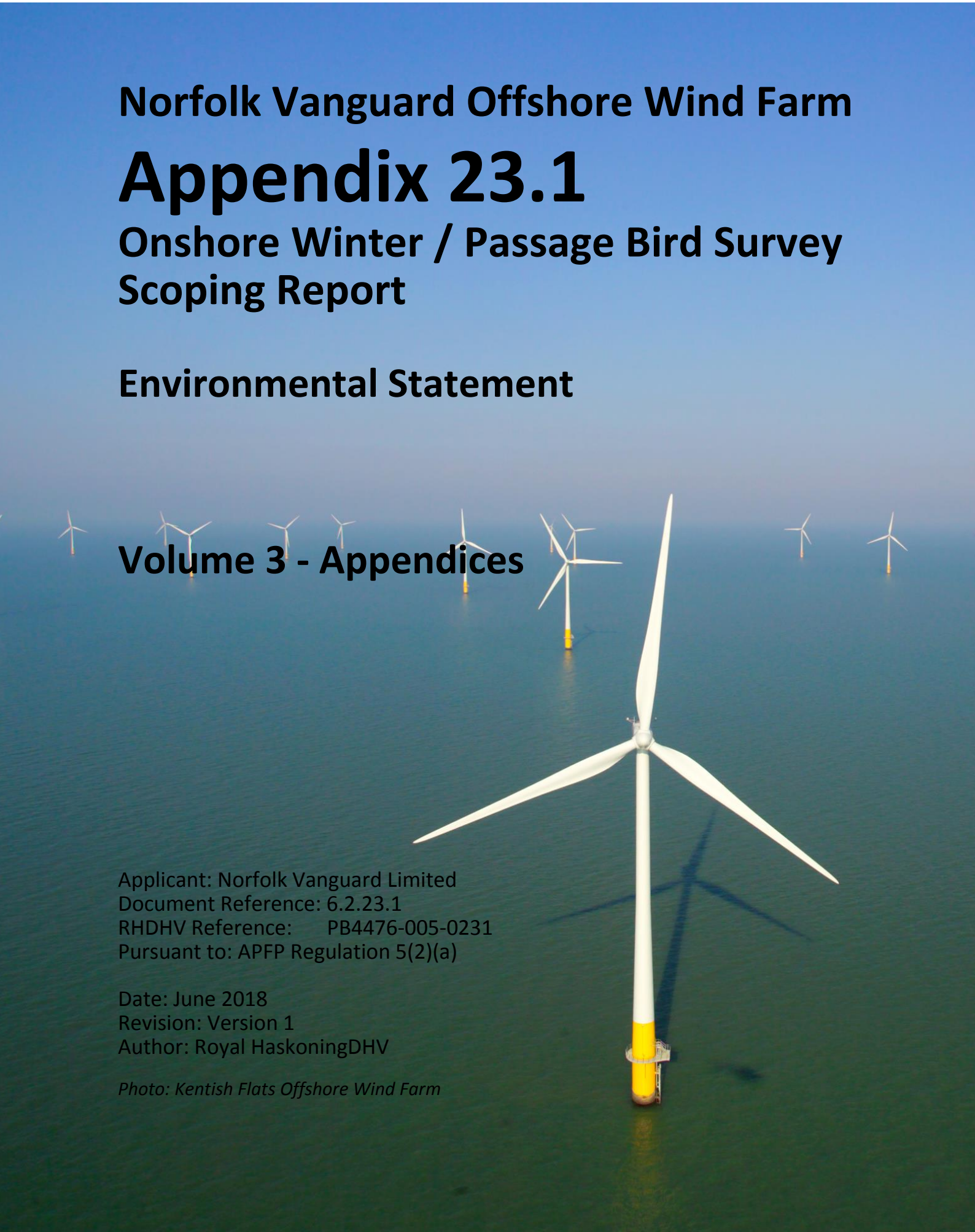
Norfolk Vanguard Offshore Wind Farm

Appendix 23.1

Onshore Winter / Passage Bird Survey Scoping Report

Environmental Statement

Volume 3 - Appendices



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Environmental Impact Assessment
Environmental Statement

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June 2018

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Glossary

BTO	British Trust for Ornithology
BoCC	Birds of Conservation Concern
CWS	County Wildlife Sites
DCO	Development Consent Order
EIA	Environmental Impact Assessment
JNCC	Joint Nature Conservation Committee
LNR	Local Nature Reserves
NNR	National Nature Reserves
NERC	Natural Environment and Rural Communities
PEIR	Preliminary Environmental Information Report
RSPB	Royal Society for the Protection of Birds
SNH	Scottish Natural Heritage
SAC	Special Areas of Conservation
SSSI	Site of Special Scientific Interest
SPA	Special Protection Area

23 ONSHORE WINTER PASSAGE BIRD SURVEY SCOPING REPORT

23.1 Introduction

1. Royal HaskoningDHV has been commissioned by Norfolk Vanguard Limited to undertake a desk-based assessment of the potential constraints posed by passage and wintering terrestrial ornithology upon the proposed Norfolk Vanguard Offshore Wind Farm (herein 'the project'). This desk-based assessment was commissioned in 2016 in order to inform the identify the need for terrestrial ornithological surveys for passage and wintering birds during autumn / winter 2016 and spring 2017.

2. This document reports the findings of this desk-based assessment, and sits as Appendix 23.1 to Chapter 23 Onshore Ornithology of the Environmental Statement (ES).

23.1.1 Project background

3. The project is located within Zone 5 (later called the 'East Anglia zone') of The Crown Estate's UK Offshore Wind Round 3 tender process.

4. The project will have a capacity of 1800MW and is separated into two offshore wind farm areas delineated by separate redline boundaries, Norfolk Vanguard East (NV East) and Norfolk Vanguard West (NV West) as well as the offshore cable corridor. The project will also include an onshore cable route and associated infrastructure, and will be connected to the National Grid at Necton in Norfolk. Figure 1 shows search areas where the onshore this infrastructure may be sited.

5. A request for a formal Environmental Impact Assessment (EIA) Screening and Scoping Opinion has been made by the Planning Inspectorate with respective to the project. The Screening Opinion confirmed that an EIA is required. The process is required as part of a Development Consent Order (DCO) application under the Planning Act 2008.

23.1.2 Role of this document in the EIA process

6. As described in section 23.1.1, the project requires an EIA as part of the DCO application process. To inform the Preliminary Environmental Information Report (PEIR) and subsequent ES, detailed baseline information in relation to terrestrial ornithological receptors is required in order to effectively assess those impacts upon these receptors which are likely to arise during the construction, operation and decommissioning of the project.

7. Detailed baseline information in relation to terrestrial ornithological receptors comprises a combination of desk-based information and survey data. If the habitats within the onshore scoping area are suitable for breeding, passage and wintering

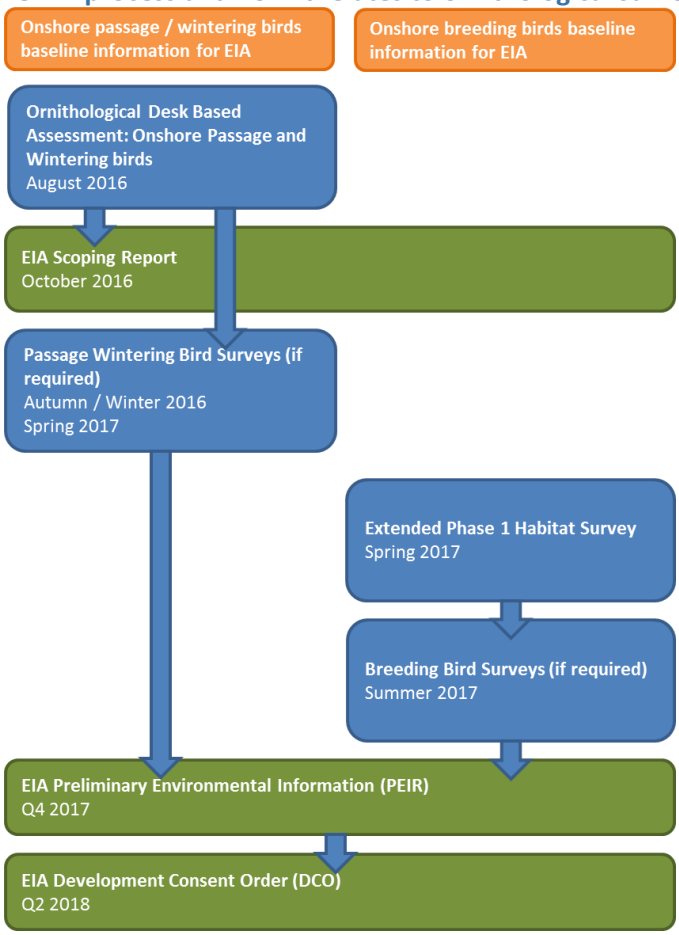
birds then surveys for these species are required to inform the EIA baseline. These surveys can only be undertaken during the relevant season. For passage and wintering bird surveys, surveys over autumn / winter 2016 and spring 2017 were required. A summary of the timetable for the PEIR and ES process and subsequent DCO application in June 2018 and how it relates to ornithological surveys is shown in Plate 1.

8. One approach for determining whether ornithological surveys are required is to undertake Extended Phase 1 Habitat Surveys along the onshore scoping area. However, such surveys were not undertaken with respect to the project until spring 2017, when a detailed onshore cable route was identified. The onshore scoping area was too large to be subject to Extended Phase 1 Habitat Surveys prior to this date. Therefore, an alternative approach was required to determine whether surveys may be required for passage and wintering birds over autumn / winter 2016 and spring 2017.

9. This document was therefore commissioned to identify the need for terrestrial ornithological surveys for passage and wintering birds which were required during autumn / winter 2016 and spring 2017, using existing available desk-based information. In addition, this document informed the EIA scoping submission with respect to terrestrial ornithology.

10. Breeding bird surveys were undertaken during summer 2017. These surveys were informed by detailed Extended Phase 1 Habitat Surveys undertaken in spring 2017, and by more detailed onshore cable route location information. As such, there is no requirement for a detailed desk-based assessment in relation to breeding birds at this time.

Plate 23.1 Timetable for the EIA process and how it relates to ornithological surveys



23.1.3 Scope of this document

11. This document contains the findings of a desk-based assessment of the potential constraint posed by terrestrial ornithology upon the project. The desk-based assessment is intended to provide an evidence base upon which to decide whether further terrestrial ornithological surveys were required with respect to the project. These in turn inform the ES and DCO application for the project.

12. This desk-based assessment comprises the following:

- Identification of all designated sites for nature conservation located within 5km of the scoping area as of Spring 2017 for the project (as shown in Figure 1);
- Identification of suitable supporting habitats for ornithological interest features of these designations within 5km of the designation boundaries;
- Assessment of which supporting habitats are likely to support ornithological interest features on passage and over winter only (interest features present within the breeding season are not part of this assessment);
- Description of the passage and wintering bird survey methods recommended for these interest features, including the location of any passage and wintering bird surveys required;

- Visual representation of these surveys locations.

13. This document has been commissioned to provide the evidence in relation to passage and wintering birds only. This document does not consider the risk to breeding birds potentially posed by the project, as detailed above. Appendix 23.4 Breeding Bird Survey Report details further surveys in relation to breeding birds.

14. The assessment contained within this document has focused on those ornithological interest features of internationally and nationally designated sites for nature conservation and their potential to be affected by the project. This assessment has not considered potential surveys requirements in relation to other species of conservation interest such as species listed on the Birds of Conservation Concern 4 (BoCC 4) 'Red list', or species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). These species will need to be assessed in detail during the design process for the project to ensure that any impacts upon these species are minimised. This impact assessment will be conducted through a desk-based review and habitat assessment walkover surveys when more information regarding the project is available.

23.1.4 Stakeholder consultation

15. Early stakeholder consultation with Natural England and Norfolk County Council has been undertaken with regards to the Onshore Winter / Passage Bird Survey Scoping Report during September 2016.

16. Early stakeholder consultation was conducted on this document to allow the scope for wintering / passage surveys to be refined so that the targeted onshore ornithological surveys, if required to inform the EIA with respect to the onshore scoping area, can commence in winter 2016 / 2017.

17. In light of the comments raised during this consultation, the following changes have been made to this document:

- The title has been changed to Appendix 23.1 Onshore Winter / Passage Bird Survey Scoping Report (previously 'Ornithological Desk Based Assessment');
- Natural England recommended inclusion of maps of pink-footed goose functionally-linked land which have been recently commissioned by Natural England;
- Norfolk County Council recommended the removal of Cawston and Marsham Heath Site of Special Scientific Interest (SSSI) from the ornithological baseline. Wintering hen harrier are a notifiable feature of this site; however, no sightings of this species have been recorded at the SSSI or in the surrounding area within the last 10 years (Norfolk County Council, pers. comm. 5th September 2016);

- Natural England recommended the inclusion of the Mattishall Moor SSSI within the ornithological baseline due to the presence of wintering snipe;
- Natural England recommended inclusion of the Special Protection Area (SPA) citation data within the ornithological baseline; and
- Natural England recommended commencing wintering bird surveys in October 2016.

23.2 Methodology

23.2.1 Introduction

18. This section details the approach used within this desk-based assessment. It contains a summary of the relevant legislation relevant to the assessment, details of the data sources obtained and details of each stage of the desk-based assessment process.

23.2.2 Relevant legislation

19. The following legislation is relevant to this desk-based assessment:

- Habitats Directive - Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora
  - The Directive provides protection for specific habitats listed in Annex I and species listed in Annex II of the Directive. The Directive sets out decision making procedures for the protection of Special Areas of Conservation (SAC) and SPA and these are implemented in the UK through The Conservation of Habitats and Species Regulations 2010.
- Birds Directive - Council Directive 79/409/EEC on the Conservation of Wild Birds
  - This Directive provides a framework for the conservation and management of wild birds in Europe. The most relevant provisions of the Directive are the identification and classification of SPAs for rare or vulnerable species listed in Annex I of the Directive and for all regularly occurring migratory species (required by Article 4). It also establishes a general scheme of protection for all wild birds (required by Article 5). The Directive requires national Governments to establish SPAs and to have in place mechanisms to protect and manage them. The SPA protection procedures originally set out in Article 4 of the Birds Directive have been replaced by the Article 6 provisions of the Habitats Directive.
- Wildlife and Countryside Act 1981 (as amended)
  - The Act makes it an offence (with exception to species listed in Schedule 2 and with additional penalties for species listed in Schedule 1) to intentionally:

kill, injure, or take any wild bird; take, damage or destroy the nest of any wild bird while that nest is in use or being built; and take or destroy an egg of any wild bird;
  - The Act makes provision for the notification and confirmation of Sites of Special Scientific Interest (SSSI).

- The Conservation of Habitats and Species Regulations 2010 (as amended)
  - The Regulations transpose the Council Directive 92 / 43 / EEC the 'Habitats Directive' in to national law (in respect of England and Wales) and requires the state to designate SACs;
  - The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2; and
  - The Regulations require competent authorities to consider or review planning permission, applied for or granted, affecting a European site, and, subject to certain exceptions, restrict or revoke permission where the integrity of the site would be adversely affected.

- Natural Environment and Rural Communities Act 2006 (NERC)
  - Section 41 of the Act requires the relevant Secretary of State to compile a list of habitats and species of principal importance for the conservation of biodiversity in England (herein 'S41 species'). Decision makers of public bodies, in the execution of their duties, must have regard to the conservation of biodiversity in England, and the list is intended to guide them.

23.2.3 Data sources

20. Freely available data sources have been used to inform this desk-based assessment. These data sources are summarised in Table 23.1.

Table 23.1 Data sources used to inform the desk based assessment

Data	Source	Date
Location of European designated sites [SPA, SAC, Ramsar]	Joint Nature Conservation Committee (JNCC)	2016
Location of UK designated sites (of ornithological interest) [SSSI, NNR, LNR]	Joint Nature Conservation Committee (JNCC)	2016
Location of UK Habitats of Principal Importance	Joint Nature Conservation Committee (JNCC)	2016

23.2.4 Methodology

23.2.4.1 Project footprint

21. At the time of writing the project was undergoing the environmental screening and scoping phase of the PEIR process. Therefore, at that time, the project boundary was a large scoping area which covered all subsequent refinements to the onshore

project area. For the purposes of this desk-based assessment, the latest version of this scoping area at the date of drafting has been used to determine which designated sites and their interest features may be at risk. The project footprint considered within this desk-based assessment is shown in Figure 1 and is referred to herein as the 'scoping area'.

22. This document has been updated for the submission of the ES and DCO application. The footprint of the scoping area and the desk-based assessment methodology is still considered to be valid and therefore no updates have been made.

23.2.4.2 Identification of Designated Sites for Ornithology

23. Using the designated site location data provided by JNCC, all internationally designated sites within 5km of the scoping area have been identified. This includes internationally designated sites i.e. SPAs, SACs and Ramsar sites. In addition, all nationally designated sites which contain ornithological interest features i.e. Royal Society for the Protection of Birds (RSPB) Reserves, certain SSSIs, certain National Nature Reserves (NNRs), certain Local Nature Reserves (LNRs) within 1km of the scoping area have been identified.

24. A survey buffer of 5km for internationally designated sites has been used as a precautionary distance drawing on Scottish Natural Heritage (SNH) Guidance on reasonable scoping distances in relation to supporting habitats (SNH, 2014) and using professional judgement in considering the potential dispersal and regular commuting movements of qualifying species during the wintering period. This buffer is in line with the typical winter foraging range for geese and swan species who are likely to forage up to this distance from night time roosts, although is lower than the possible foraging range of species such as pink-footed goose which are typically 15-20km (SNH, 2013). The possibility for some geese species to forage across this larger range has been considered within this assessment, however the core foraging area for this species is considered likely to be within the 5km range.

25. The survey buffer of 1km for nationally designated sites is based on an assessment of the potential disturbance distance for wintering bird species (see section 23.2.4.4 below). This is a precautionary distance that has been based on the upper limit of disturbance buffers related in Ruddock and Whitfield (2007). This buffer is highly precautionary and could potentially be reduced for field surveys when species-specific potential buffers can be used (typically 400m or less).

Table 23.2 List of designated sites considered within this assessment

Designated site type	Legal protection	Considered for this assessment?
SPA	Birds Directive The Conservation of Habitats and Species Regulations 2010	All
SAC	Habitats Directive The Conservation of Habitats and Species Regulations 2010	Sites with passage / wintering ornithological interest features only
Ramsar site	Convention on Wetlands of International Importance	Sites with passage / wintering ornithological interest features only
RSPB Reserve	No legal protection	All
SSSI	Wildlife and Countryside Act 1981 (as amended)	Sites with passage / wintering ornithological interest features only
NNR	National Parks and Access to the Countryside Act 1949 Wildlife and Countryside Act 1981 (as amended)	Sites with passage / wintering ornithological interest features only
LNR	National Parks and Access to the Countryside Act 1949	Sites with passage / wintering ornithological interest features only

26. Following the identification of designated sites, the ornithological interest features (passage or wintering) of each of these designated sites have been collated and summarised within this desk-based assessment to provide an account of the ornithological receptors associated with each site. As this assessment is designed to inform the potential need for passage and or wintering bird surveys over 2016-2017, any sites which have a breeding bird interest feature(s) have not been considered as part of the scope of this assessment.

23.2.4.3 Identification of Supporting Habitats for Designated Sites

27. The interest features of international designated sites are not restricted solely to the boundaries of each designated site, and many species will seek out habitats outside the designated site boundary in order to forage (e.g. pink-footed goose will have a preference for foraging on arable farmland (RSPB, 2008)). These habitats are not within the designated site boundary but can be crucial to the success of populations supported by that designated site. They are referred to in this document as 'supporting habitats'.

28. Those habitats most likely to provide supporting habitat are those designated as UK Habitats of Principal Importance. Within the UK, these are recorded and mapped by JNCC and are available to use in this desk-based assessment.

29. The UK Habitats of Principal Importance which are located both within 5km of internationally designated sites with ornithological interest features and which are within 1km of the scoping area have been identified. Only those UK Habitats of Principal Importance which are considered to be most likely to provide important

supporting habitats for ornithological interest features were identified during this process. These include:

- Coastal Saltmarsh;
- Coastal Sand Dunes;
- Coastal Vegetated Shingle;
- Mudflats;
- Saline Lagoons;
- Coastal and Floodplain Grazing Marsh;
- Lowland Fen;
- Reedbeds;
- Lowland Heathland; and
- Rivers and Lakes.

30. In addition to these habitats, farmland (both arable and pasture), a non-designated habitat, provides suitable foraging habitat for selected ornithological interest features and has therefore been also considered within this assessment.

31. No assessment of the supporting habitats for interest features of nationally designated sites has been undertaken. This is because those interest features supported by these nationally designated sites are not part of an internationally important assemblage, and therefore those supporting habitats outside the designated site boundaries are not considered critical for their survival. Instead, it is the habitats within the nationally designated site boundaries which are important for these interest features.

23.2.4.4 Screening of Ornithological Risk Areas

32. 'Ornithological risk areas' are those locations which may support wintering birds associated with designated sites for nature conservation.

33. All designated sites with ornithological interest features present on passage or over winter located within the scoping area will constitute an ornithological risk area. In addition, all designated sites located within 1km of the scoping area will also constitute an ornithological risk area. This is because activity taking place within the scoping area which may cause disturbance may affect species up to 1km away. This is a precautionary distance (and could be subject to change) that is based on the upper limit of disturbance buffers related in Ruddock and Whitfield (2007).

34. All supporting habitats which are both within 5km of the internationally designated sites and within, or within 1km of, the scoping area boundary will also be considered as an ornithological risk area. These habitats will be screened against the ornithological interest features for the relevant internationally designated sites, to

identify those habitats which may support ornithological interest features. Species information from the British Trust for Ornithology (BTO) and expert judgement has been used to determine which species may be associated with these supporting habitats, and at what distance from the designated site that species may be using said supporting habitat.

35. The output of this screening exercise is a map of those habitats which are considered to have the potential to support ornithological interest features of the identified designated sites, and which are located within 1km of the scoping area and hence could be vulnerable to an impact from the project.

23.2.4.5 Identification of Ornithological Survey Locations

36. The habitats identified during the screening exercise are considered in detail for the need for passage and wintering bird surveys at these locations, to provide baseline data with regards to the species that may be using these supporting habitats.

37. For the purposes of this document and the reasoning outlined previously, the passage and wintering bird survey methodologies will then be set out in relation to these habitats, including the timings, survey requirements, and location of survey areas and survey transects / vantage points required for each survey.

23.3 Baseline Environment

23.3.1 Introduction

38. The following section contains the ornithological baseline data with respect to the onshore scoping area. Set out below are the designated sites for nature conservation containing ornithological interest features to be considered within this assessment.

23.3.2 Designated sites

39. Figure 2 (a-k) shows all internationally designated sites for nature conservation located within 5km of the onshore scoping area, and all other designated sites for nature conservation located within 1km of the scoping area (the 'survey area').

40. Of these sites, not all contain ornithological interest features which are present on passage or over winter. Table 23.3 lists all of the designated sites falling within the survey area and details which of those contain ornithological interest features which are present on passage or over winter and hence are relevant to this assessment.

Table 23.3 Designated sites for nature conservation within the survey area (*those sites with interest features on passage / over winter are highlighted in blue*)

Site name	Designation	Ornithological interest features (Y/N)	Passage / Winter features (Y/N)	Approximate distance to onshore scoping area (km)
Norfolk Valley Fens	SAC	N		Within scoping area
River Wensum	SAC, SSSI	Y	N	Within scoping area
Beetley & Hoe Meadows	SSSI	N		Within scoping area
Dereham Rush Meadow	SSSI	Y	Y	Within scoping area
Foxley Wood	SSSI, NNR	N		Within scoping area
Dillington Carr, Gressenhall	SSSI	Y	N	Within scoping area
East Ruston Common	SSSI	N		Within scoping area
Holly Farm Meadow, Wendling	SSSI	N		Within scoping area
Horningtoft Wood	SSSI	N		Within scoping area
Honeypot Wood, Wendling	SSSI	N		Within scoping area
River Nar	SSSI	Y	N	Within scoping area
Whitwell Common	SSSI	N		Within scoping area
Bryant's Heath, Felmingham	SSSI	N		Within scoping area
Cawston and Marsham Heaths	SSSI	Y	N[1]	Within scoping area
Horse Wood, Mileham	SSSI	N		Within scoping area
Happisburgh Cliffs	SSSI	N		Within scoping area
Westwick Lakes	SSSI	Y	Y	Within scoping area
Booton Common (Norfolk Valley Fens)	SSSI	Y	N	Within scoping area
Buxton Heath (Norfolk Valley Fens)	SSSI	N		Within scoping area
Potter & Scarning Fens, East Dereham (Norfolk Valley Fens)	SSSI	N		Within scoping area
Felmingham Cutting	LNR	N		Within scoping area
Knapton Cutting	LNR	N		Within scoping area
Litcham Common	LNR	N		Within scoping area
Pigney's Wood	LNR	N		Within scoping area
Paston Great Barn	SSSI, NNR	N		Within 1km of scoping area
Horse Wood - Mileham	SSSI	N		Within 1km of scoping area
Badley Moor	SSSI	Y	N	Within 1km of scoping area
Mundesley Cliffs	SSSI	N		Within 1km of scoping area
Swanton Novers Wood	SSSI, NNR	Y	N	Within 1km of scoping area
Mattishall Moor	SSSI	Y	Y	Within 1km of scoping area
Broadland	SPA	Y	Y	Within 5km of scoping area
Great Yarmouth North Denes	SPA	Y	N	Within 5km of scoping area
Breckland	SPA	Y	N	Within 5km of scoping area
Sutton Fen	RSPB Reserve	Y	Y	Within 5km of scoping area
Broadland	Ramsar	Y	Y	Within 5km of scoping area
The Broads	SAC	N		Within 5km of scoping area
Paston Great Barn	SAC	N		Within 5km of scoping area
Overstrand Cliffs	SAC	N		Within 5km of scoping area
Breckland	SAC	N		Within 5km of scoping area

[1] Cawston and Marsham Heaths SSSI lists wintering hen harrier as a notifiable feature on the site citation, however Norfolk County Council have advised that no sightings of this species have been recorded at the SSSI or in the surrounding area within the last 10 years (Norfolk County Council, pers. comm. 5th September 2016), and therefore the site should not be considered further.

41. Of the designated sites falling within the survey area, six contain ornithological interest features relating to passage and / or wintering birds. A further eight contain ornithological interest features relating to breeding birds.

42. Of the six designated sites with ornithological interest features relating to passage and / or wintering birds, a number are overlapping sites, namely the Broadland SPA and Ramsar site, which also contains Sutton Fen RSPB Reserve. Therefore, a total of four distinct geographical entities are scoped into this desk-based assessment. For easy of reference these are summarised in Table 23.4.

Table 23.4 Designated sites for nature conservation scoped in

Site name	Designation	Approximate distance to scoping area
Dereham Rush Meadow	SSSI	Within scoping area
Westwick Lakes	SSSI	Within scoping area
Mattishall Moor	SSSI	Within 1km of scoping area
Broadland	SPA, Ramsar, incorporating Sutton Fen RSPB Reserve	Within 5km of scoping area

43. Following consultation on an earlier draft of this document, Norfolk County Council advised that the non-statutory designated County Wildlife Sites (CWS) Pits near Easthaugh (CWS 669) and Sparham Pools (CWS 673) located adjacent to the River Wensum SAC have notable ornithological interest features. Norfolk County Council further advised that wintering bird surveys in relation to these sites would not be expected in relation to the ornithological assemblage supported by these sites, and they are therefore not considered further within this document.

23.3.3 Ornithological interest features

44. The six sites scoped in above are all designated as sites for nature conservation due to the bird species which they support either on passage or over winter. This section describes those interest features.

23.3.3.1 Broadland SPA

45. Broadland SPA is located approximately 1.6km south of the scoping area boundary. The site is designated for the features in Table 23.5.

Table 23.5 Qualifying features of the Broadland SPA (*population counts are derived from the SPA citation*)

This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:
Over winter; Bewick's Swan Cygnus *columbianus bewickii*, 495 individuals representing up to 7.1% of the wintering population in Great Britain (5 year peak mean 1987/8-1991/2)

This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:
Bittern *Botaurus stellaris*, 2-3 individuals representing up to 10-15% of the wintering population in Great Britain (5 year peak mean 1987/8-1991/2) Hen Harrier *Circus cyaneus*, 22 individuals representing up to 3% of the wintering population in Great Britain (5 year peak mean 1987/8-1991/2) Ruff *Philomachus pugnax*, 96 individuals representing up to 6.4% of the wintering population in Great Britain (5 yr peak mean 1987/8-1991/2) Whooper Swan *Cygnus cygnus*, 121 individuals representing up to 2% of the wintering population in Great Britain (5 yr peak mean 1987/8-1991/2) Marsh Harrier *Circus aeruginosus*, 16 individuals representing up to 16% of the wintering population in Great Britain (5 year peak mean 1987/8-1991/2)
This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:
Over winter; Gadwall *Anas strepera*, 486 individuals representing up to 4.0% of the wintering Northwestern Europe population (5 yr peak mean 1987/8-1991/2) Shoveler *Anas clypeata*, 675 individuals representing up to 1.7% of the wintering Northwestern Europe population (5 yr peak mean 1987/8-1991/2) Widgeon *Anas penelope*, 8,966 individuals representing up to 1.2% of the wintering Northwestern Europe population (5 yr peak mean 1987/8-1991/2) The following species was also included under the SPA Review (Stroud et al. 2001): Pink-footed Goose *Anser brachyrhynchus*, 3,290 individuals representing up to 1.5% of the wintering Eastern Greenland/Iceland/UK population (5 yr peak mean 1994/5-1998/9)
Under the SPA Review (Stroud et al. 2001), the area also qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl
Over winter, the area regularly supports 22,603 individual waterfowl (RSPB, Count 99/00) including: Cormorant *Phalacrocorax carbo*, Bewick's Swan Cygnus *columbianus bewickii*, Whooper Swan *Cygnus cygnus*, Ruff *Philomachus pugnax*, Pink-footed Goose *Anser brachyrhynchus*, Gadwall *Anas strepera*, Bittern *Botaurus stellaris*, Great Crested Grebe *Podiceps cristatus*, Coot *Fulica atra*, Bean Goose *Anser fabalis*, White-fronted Goose *Anser albifrons,* Wigeon *Anas penelope*, Teal *Anas crecca*, Pochard *Aythya ferina*, Tufted Duck *Aythya fuligula*, Shoveler *Anas clypeata*.

46. Following consultation on a draft version of this document, Natural England have supplied draft maps of functionally-linked (i.e. supporting) land for pink-footed goose outside of the Broadland SPA boundary (Natural England, pers. comm. 9th September 2016). This information provides additional baseline data on the key areas for this Broadland SPA qualifying species within the scoping area. The draft maps are shown in Appendix 23.3a and b.

47. The maps indicate key feeding areas for pink-footed goose within the scoping area is located within an approximate triangle between the villages of Happisburgh Common, Bacton and Witton Bridge, towards the east of the scoping area.

23.3.3.2 Broadland Ramsar site

48. Broadland Ramsar site is located approximately 1.6km south of the scoping area boundary. The site is designated for the features in Table 23.6.

Table 23.6 Qualifying features of the Broadland Ramsar site (*population counts are derived from the Ramsar Information Sheet*)

Ramsar criterion 6 – species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation):
Species with peak counts in winter: Tundra swan, NW Europe 196 individuals, representing an average of 2.4% of the GB population (5 year peak mean 1998/9- 2002/3) Eurasian wigeon, NW Europe 6769 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3) Gadwall, NW Europe 545 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9- 2002/3) Northern shoveler, NW & C Europe 247 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9- 2002/3)
Species/populations identified subsequent to designation for possible future consideration under criterion 6.
Species with peak counts in winter: Pink-footed goose, Greenland, Iceland/UK 4263 individuals, representing an average of 1.7% of the population (5 year peak mean 1998/9-2002/3) Greylag goose, *Anser anser*, Iceland/UK, Ireland 1007 individuals, representing an average of 1.1% of the population (Source period not collated)

23.3.3.3 Sutton Fen RSPB Reserve

49. Sutton Fen RSPB Reserve is located approximately 3.4km south of the scoping area boundary.

50. The Sutton Fen RSPB Reserve is comprised of fen habitat which forms part of the Broadland SPA and Ramsar

51. The Reserve is closed to the public to ensure bird disturbance levels are minimised, making it particular susceptible to anthropogenic disturbance.

52. The site is not designated for specific features, but bittern and marsh harrier are associated with the site.

23.3.3.4 Dereham Rush Meadow SSSI

53. Dereham Rush Meadow SSSI is located within the scoping area boundary. The site is designated for the following features:

54. The site is notified as a SSSI primarily for its wide range of grassland and woodland communities which are particularly unusual in Norfolk. However, the site is also of interest as its winter floods are periodically used by waterfowl.

23.3.3.5 Mattishall Moor SSSI

55. Mattishall Moor SSSI is located within 1km of the scoping area boundary. The site is designated for the following features:

56. The site is notified as a SSSI primarily as one of the main geographical distributions of the internationally important *Schoenus nigricans - Juncus subnodulosus* community, but the site is also notified for presence of wintering snipe.

23.3.3.6 Westwick Lakes SSSI

57. Westwick Lakes SSSI is located within the scoping area boundary. The site is designated for the following features:

58. The site is notified as a SSSI as lakeland habitat which supports a number of interest features, including considerable ornithological interest with large flocks of wildfowl wintering in the lakes.

59. One lake (Perch Lake) attracts many species of diving duck in winter including goldeneye *Bucephala clangula* and goosander *Mergus merganser*.

23.3.4 Summary

60. The identification of designated sites with ornithological interest features has identified six sites, including two internationally designed sites and four nationally designated sites. These sites contain interest features wintering bird species only, no designated sites with ornithological passage interest features have been identified. The pathways through which the interest features of these six designated sites may be affected by the project are considered in the next section.

23.4 Screening of Ornithological Risk Areas

23.4.1 Introduction

61. The following section considers what ornithological receptors associated with the designated sites identified in section 23.3 may potentially be affected by the proposed works, and therefore what receptors may require ornithological surveys.

23.4.2 Ornithological risk areas

62. The identification of ornithological risk areas considers two potential ways in which ornithological interest features of designated sites identified in section 23.3 that may be affected by the project:

- Those species associated with any designated site which are located within 1km of the proposed works area; and
- Qualifying species of an internationally-designated site which may use supporting habitats within 5km of the designated site over winter.

63. Using these two potential impact pathways, the interest features of designated sites identified in section 23.3 have been considered for how they may be affected depending on the activities taking place within the scoping area.

23.4.2.1 Broadland SPA, Ramsar and Sutton Fen RSPB Reserve

64. The Broadland SPA, Ramsar site and Sutton Fen RSPB Reserve, are located more than 1km outside of the scoping area, and as such there is unlikely to be any pathway to potentially directly affect species using these designated sites.

65. Habitats which may support interest features of these designated sites are located within 5km of these designated sites, as shown on Figure 3b. These include areas of:

- Reedbed
- Lowland fen
- Rivers and Lakes
- Lowland heathland
- Coastal habitats
- Farmland (pasture and arable)

66. These habitats may be used by species of the Broadland SPA, Ramsar site and Sutton Fen RSPB Reserve.

23.4.2.1.1 Broadland SPA

67. Of the qualifying features of the Broadland SPA, there are no qualifying species using the site on passage.

68. The wintering species are likely to utilise a range of supporting habitats outside the boundary of the SPA over the winter months. Hen Harrier are likely to utilise a range of habitats, including lowland farmland, heathland, coastal marshes, fenland and river, whereas bittern are associated solely with lowland fen during winter. The various qualifying species of wildfowl use predominantly reedbeds and rivers and lakes, although the qualifying geese species also rely on winter crop waste

associated with arable agriculture. Cormorants and grebes are more firmly associated with coastal habitats or sizeable inland waterbodies over winter.

69. In summary, the qualifying species are likely to use the following supporting habitats:

- Reedbed;
- Lowland fen;
- Rivers and Lakes;
- Lowland heathland;
- Coastal habitats; and
- Farmland (pasture and arable).

23.4.2.1.2 Broadland Ramsar site

70. Of the qualifying features of the Broadland Ramsar site, there are no qualifying species using the site on passage.

71. The wintering species are likely to utilise a range of supporting habitats over winter. The various qualifying species use predominantly reedbeds and rivers and lakes, although the qualifying geese species also rely on winter crop waste associated with arable agriculture.

72. In summary, the qualifying species are likely to use the following supporting habitats:

- Reedbed;
- Lowland fen;
- Rivers and Lakes; and
- Farmland (pasture and arable).

23.4.2.1.3 Sutton Fen RSPB Reserve

73. Sutton Fen has no specific qualifying species, but bitten and marsh harrier are associated with this site. These species are considered under the Broadland SPA.

23.4.2.2 Dereham Rush Meadow SSSI

74. The Dereham Rush Meadow SSSI is located within the scoping area, and as such there may be direct effects upon this designated site.

23.4.2.3 Mattishall Moor SSSI

75. The Mattishall Moor SSSI is located within 1km of the scoping area, and as such there are unlikely to be direct effects upon this designated site. There may be indirect effects upon this designated site due to its location in the vicinity of the scoping area.

23.4.2.4 Westwick Lakes SSSI

76. The Westwick Lakes SSSI is located within the scoping area, and as such there may be direct effects upon this designated site.

23.4.3 Summary

77. In summary, screening of the ornithological risk areas of the designated sites associated with the scoping area has identified a series of supporting habitats outside the boundary of the Broadland SPA and Ramsar site which may support qualifying features of these internationally designated sites. These are:

- Reedbed;
- Lowland fen;
- Rivers and Lakes;
- Lowland heathland;
- Coastal habitats; and
- Farmland (pasture and arable).

78. Figure 3b shows the location of these habitats within 5km of the Broadland SPA and Ramsar site, and also within 1km of the scoping area boundary. These habitats may therefore both support qualifying features of the Broadland SPA and Ramsar site over winter outside of the SPA / Ramsar site boundary, and be close enough to the scoping area to be potentially subject to disturbance effects. It is these areas which are recommended to be subject to wintering bird surveys to ascertain their use by qualifying features of the Broadland SPA and Ramsar site.

79. In addition, the habitat within the boundary of the Dereham Rush Meadow, Mattishall Moor and Westwick Lakes SSSIs is also recommended to be subject to wintering bird surveys in order to determine the use of these sites by wintering birds (Figure 3a).

80. This recommendation assumes that works with the potential to cause disturbance will take place within 1km of these habitats and site boundaries during the proposed development. If it can be confirmed that this is not the case, there is no need to undertake these surveys.

81. Table 23.7 summarises the ornithological risk areas identified by this assessment.

Table 23.7 Ornithological risk areas with respect to the project

Site name	Designation	Ornithological risk area
Broadland	SPA, Ramsar, incorporating Sutton Fen RSPB Reserve	The following supporting habitats both within 5km of site boundary and within (or within 1km of) scoping area boundary: • Reedbed • Lowland fen

Site name	Designation	Ornithological risk area
		• Rivers and Lakes • Lowland heathland • Coastal habitats • Farmland (pasture and arable)
Dereham Rush Meadow	SSSI	Land within site boundary
Mattishall Moor	SSSI	Land within site boundary
Westwick Lakes	SSSI	Land within site boundary

82. Please note these risk areas have been determined using professional judgement, and wintering species may be present outside of the risk areas identified above. However, these areas are considered to represent a reasonable area for survey effort when considering those habitats which may support qualifying features of the Broadland SPA and Ramsar site over winter and outside of the designated site boundary. As more project information becomes available, including detailed information about the location of the onshore cable corridor and associated infrastructure, more targeted areas for field surveys within these broader areas may be possible.

23.5 Proposed Ornithological Surveys

23.5.1 Introduction

83. Section 23.4 of this document sets out the requirement for wintering bird surveys with respect to supporting habitats associated with the Broadland SPA and Ramsar site and with respect to the Dereham Rush Meadow, Mattishall Moor and Westwick Lakes SSSIs.

84. This section describes the details and scope of these wintering bird surveys.

23.5.2 Survey approach

23.5.2.1 Surveys in relation to Broadland SPA / Ramsar site

85. Wintering bird surveys are recommended in relation to those supporting habitats which are located outside of the Broadland SPA[2]. These habitats are shown in Figure 3b. This section sets out the proposed approach to these wintering bird surveys. The exact nature of these surveys and the locations of the surveys will be agreed with Natural England and discussed with RSPB prior to surveys commencing.

86. The purpose of these surveys would be to identify whether qualifying species of the Broadland SPA and Ramsar site are present within these supporting habitats. This

[2] As this note has been updated for ES and DCO submission, the wintering bird survey report can be found in Appendix 23.2.

information can subsequently be used to form the ecological baseline with respect to the project.

87. These surveys should take the form of systematic walk-over surveys (e.g. using transects) and / or vantage point surveys along the habitats identified in Figure 3b. These are focused in four areas – the habitats along the valley of the North Walsham and Dilham Canal (disused), along Hundred Stream (Mown Fen), along the coastal habitats between Bacton and Eccles-on-Sea and within the farmland in the broad area east of North Walsham.

88. Surveys of these habitats should be undertaken once per month from October 2016 to March 2017. The specific methods followed during these surveys will be determined during the initial site visit. These surveys should follow BTO's WeBS Core Count Methodology (following Bibby *et al*., 2000) record birds which are readily visible from suitable (and agreed) vantage points and / or along walked transects. Surveys should record survey date and time, prevailing weather conditions, transect coverage, and number and species of birds observed foraging / roosting within the habitat visible from the transect (all species, not just the species identified in section 23.3). A note should be made of the background level of disturbance within and adjacent to these areas. Surveys will be conducted by experience bird surveyors.

89. The exact location of transects and vantage points would be determined on site (and subsequently agreed with Natural England and discussed with RSPB), when an assessment of the quality of available habitats would be made.

23.5.2.2 Surveys in relation to Dereham Rush Meadow, Mattishall Moor and Westwick Lakes SSSIs

90. Wintering bird surveys are recommended in relation to habitats located within the Dereham Rush Meadow, Mattishall Moor and Westwick Lakes SSSIs. These sites are shown in Figure 3a. This section sets out the proposed approach to these wintering bird surveys. The exact nature of these surveys and the locations of the surveys should be agreed with Natural England and RSPB prior to surveys commencing.

91. The purpose of these surveys would be to identify whether the interest features of these SSSIs are present and in what numbers within the areas of the SSSIs. This information can subsequently be used to form the ecological baseline with respect to the project.

92. These surveys should take the form of systematic walk-over surveys (e.g. using transects) and / or vantage point surveys within the Dereham Rush Meadow, Mattishall Moor and Westwick Lakes SSSI boundaries. In the case of Westwick Lakes, any transects walked would be around the lakes.

93. Surveys of these habitats should be undertaken once per month from October 2016 to March 2017. The specific methods followed during these surveys will be determined during the initial site visit. These surveys should follow BTO's WeBS Core Count Methodology (following Bibby *et al*., 2000) record birds which are readily visible from suitable vantage points and / or along walked transects. Surveys should record survey date and time, prevailing weather conditions, transect coverage, and number and species of birds observed foraging / roosting within the habitat visible from the transect (all species, not just the species identified in section 23.3). A note should be made of the background level of disturbance within and adjacent to these areas. Surveys will be conducted by experience bird surveyors.

94. The exact location of transects and vantage points would be determined on site (and subsequently agreed with Natural England and RSPB), when an assessment of the quality of available habitats would be made.

23.5.2.3 Surveys in relation to other species

95. This assessment has focused on those ornithological interest features of internationally and nationally designated sites for nature conservation and their potential to be affected by the project. This assessment has not considered potential surveys requirements in relation to other species of conservation interest including species listed on the BoCC 4 'Red list', or species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). These species will need to be assessed in detail during the design process for the project to ensure that any effects upon these species are minimised. This will be conducted through habitat assessment surveys when more information regarding the project is available, and will not be informed by the passage wintering surveys which form the scope of this assessment.

23.6 Conclusions

23.6.1 Summary

96. This assessment was commissioned to assess the potential constraint posed by terrestrial ornithology upon the project, and to identify the potential need for passage and wintering bird surveys to assess this constraint.

97. This assessment identified a series of ornithological risk areas i.e. locations which may either support qualifying features of European designated sites by virtue of their habitat type, or locations within the boundaries of SSSIs which are notified in part for the wintering ornithological they support. These ornithological risk areas are shown in Figure 3 (a-b).

98. It is recommended that these areas be avoided by the project. If this is not feasible, wintering bird surveys will have to be conducted in relation to these ornithological risk areas.

99. Wintering bird surveys for supporting habitats in relation to the Broadland SPA and Ramsar site will follow Bibby *et al*. (2000) and would be likely to take the form of a combination of systematic walkover (e.g. transect) and vantage point surveys along the habitats shown in Figure 3 (a-b) plus arable and pasture farmland, recording bird species and numbers.

100. Wintering bird surveys in relation to the Dereham Rush Meadow, Mattishall Moor and Westwick Lakes SSSIs will follow the same methodology, and will be restricted to those habitats located within the SSSIs.

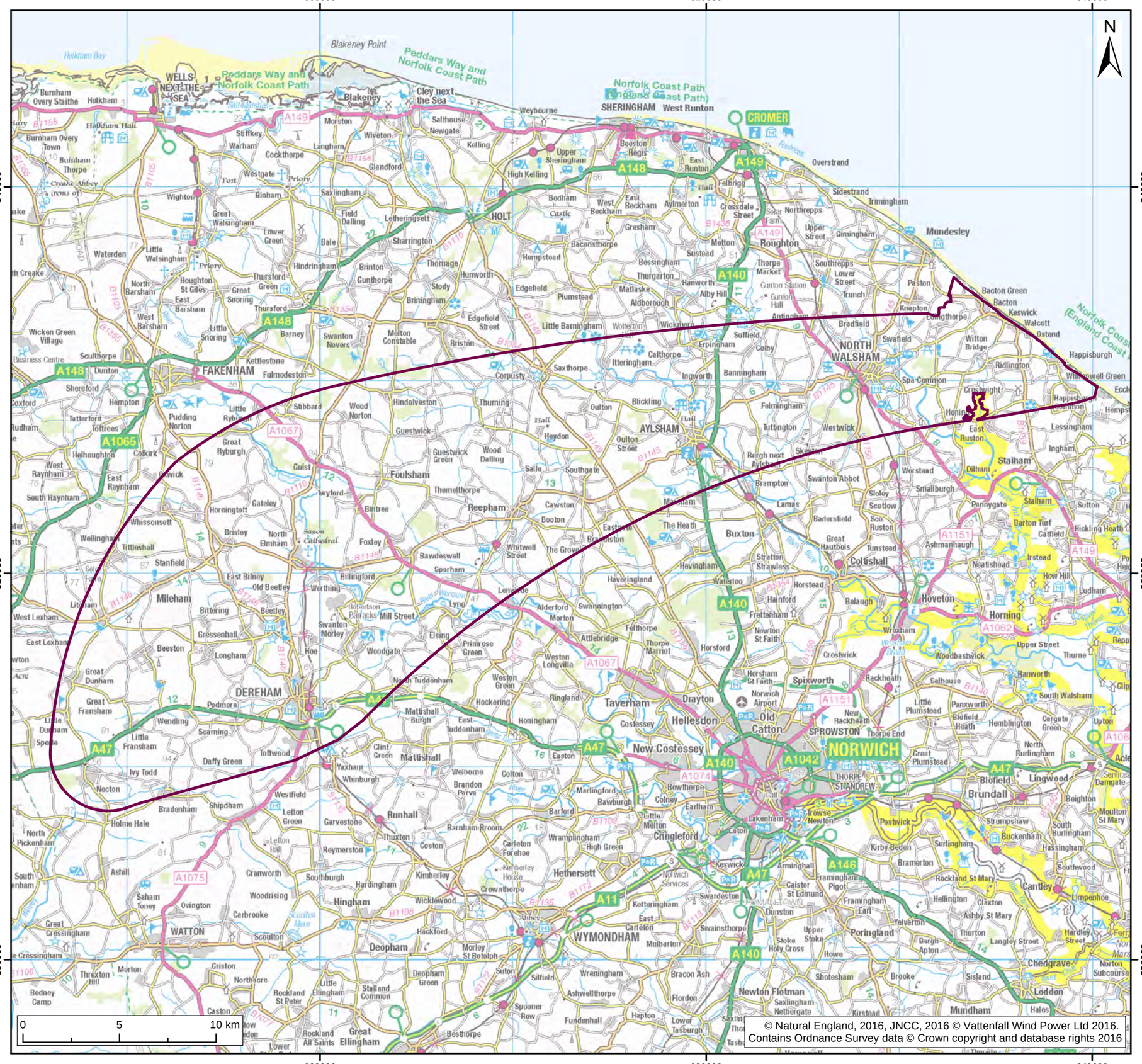
23.6.2 Further work

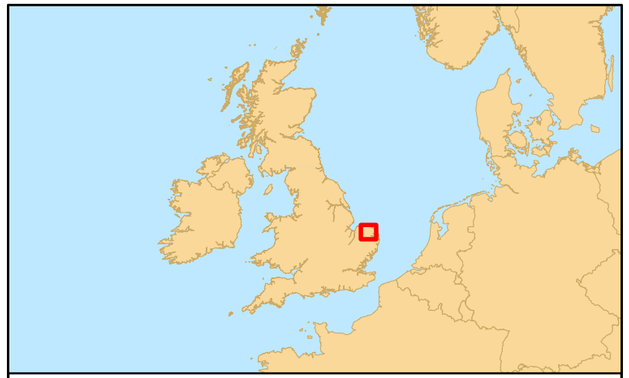
101. This desk-based assessment identified the potential constraint posed by passage and wintering bird species in relation to the project. This assessment also identified those designated sites which support breeding birds within 5km of the scoping area, however assessment of ornithological risk areas for breeding birds is not part of the scope of this assessment (as noted in section 23.1.2). If in the future there are works which may take place within 1km of supporting habitats of qualifying species of the internationally designated sites within 5km of the scoping area, or works which may take place within 1km of any other nationally designated sites for nature conservation, breeding bird surveys may be required. The baseline environment information (section 23.3) contained within this desk-based assessment can be used to inform the requirements of these future surveys, in addition to preliminary habitat assessment walkover surveys for breeding birds.

23.7 References

Bibby, C.J., Burgess, N.D., Hill, D.A., and Mustoe, S.H. (2000). Bird Census Techniques, 2nd ed. Academic Press, London.
Ruddock, M. and Whitfield, D.P. (2007). A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage
Scottish Natural Heritage (2013). Guidance: Assessing Connectivity with Special Protection Areas (SPAs). July 2013
Scottish Natural Heritage (2014). Guidance: Recommended bird survey methods to inform impact assessment of onshore wind farms. May 2014

23.8 Figures





Legend:

Onshore Scoping Area

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Onshore Scoping Area Location

Figure: 1 | Drawing No: PB4476-DBA-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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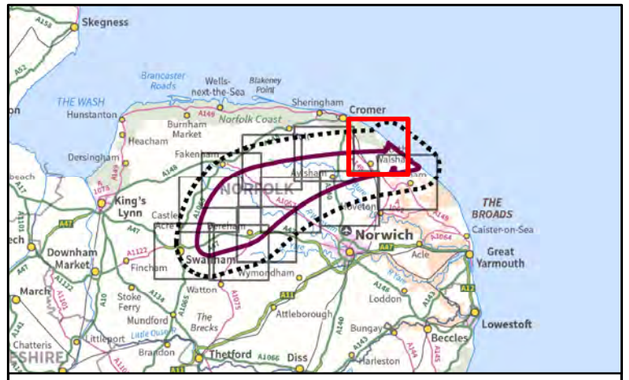

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Local Nature Reserve (LNR)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2a | Drawing No: PB4476-DBA-002

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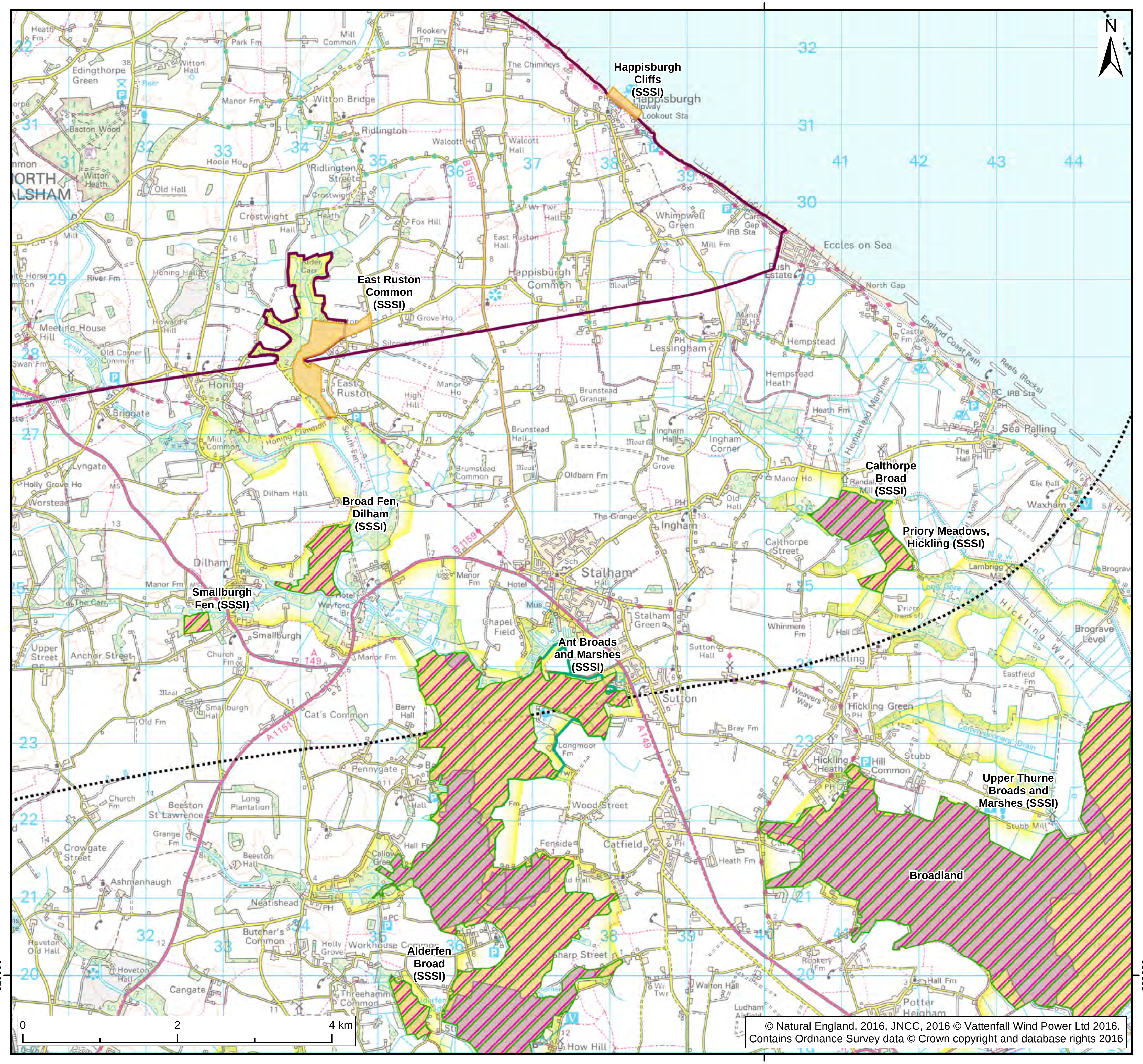

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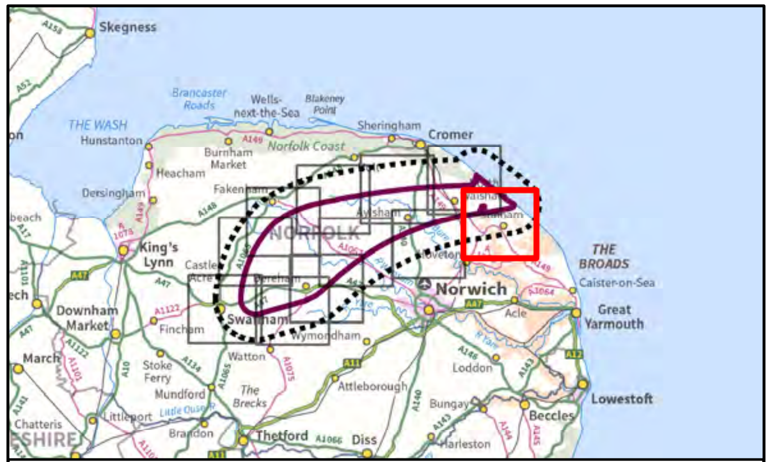

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Sites of Special Scientific Interest (SSSI)
- Ramsar
- National Nature Reserve (NNR)
- RSPB Reserve

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2b Drawing No: PB4476-DBA-002

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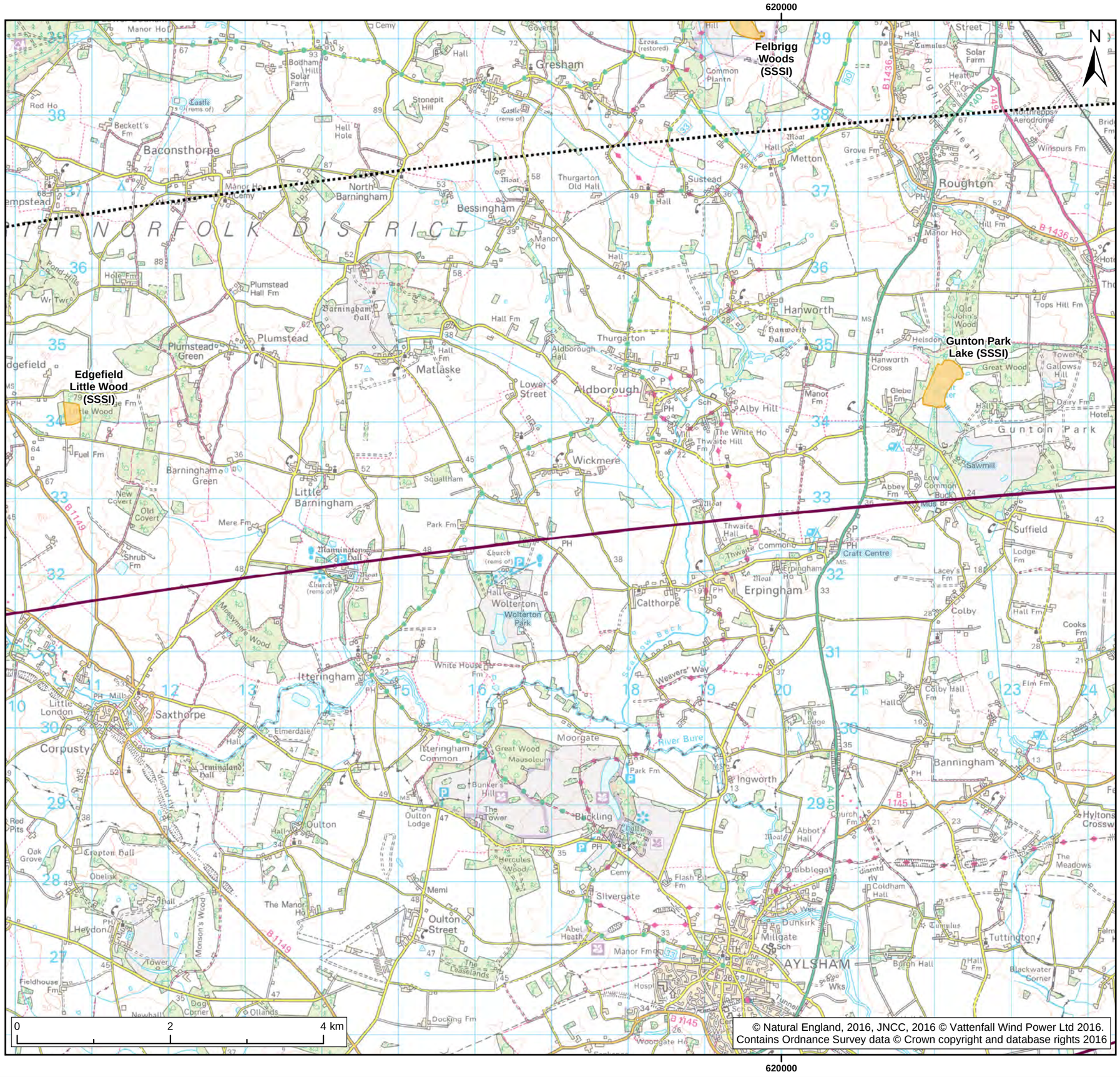

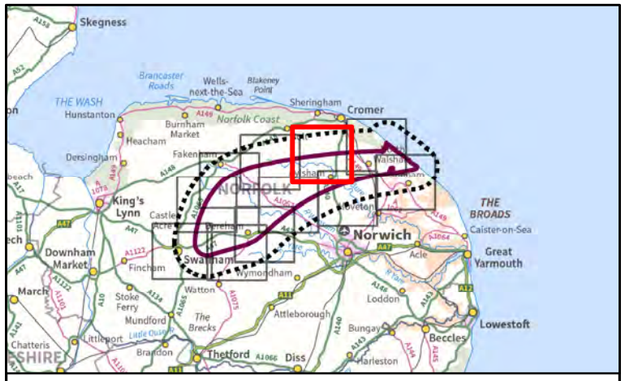

Legend:

- Onshore Scoping Area
- 5km Study Area
- Sites of Special Scientific Interest (SSSI)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2c | Drawing No: PB4476-DBA-002

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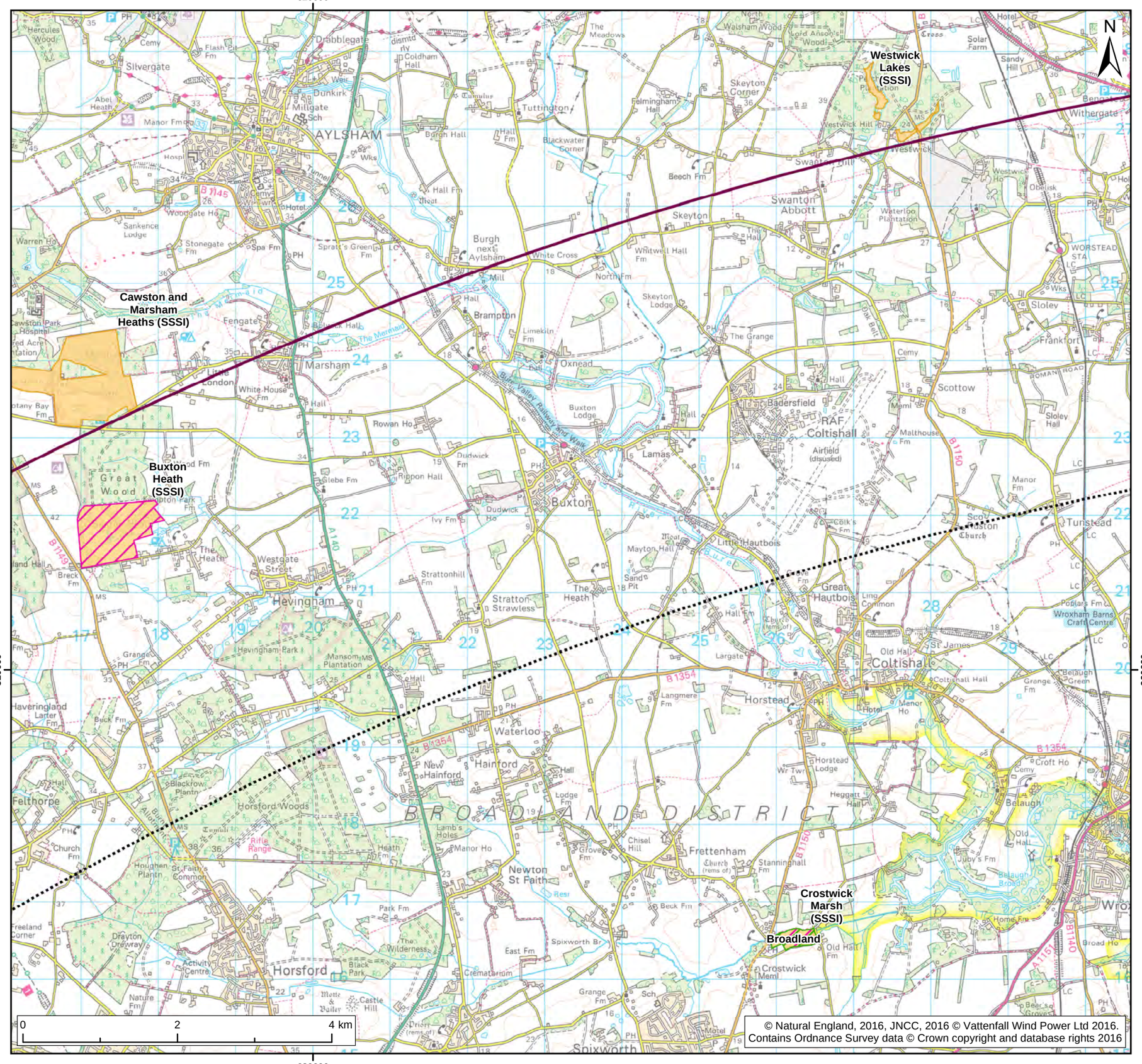

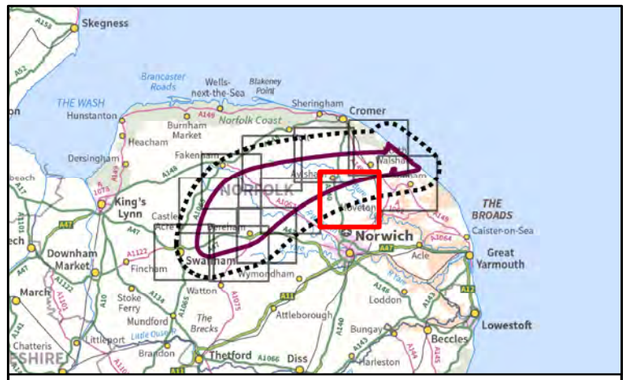

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Sites of Special Scientific Interest (SSSI)
- Ramsar

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2d | Drawing No: PB4476-DBA-002

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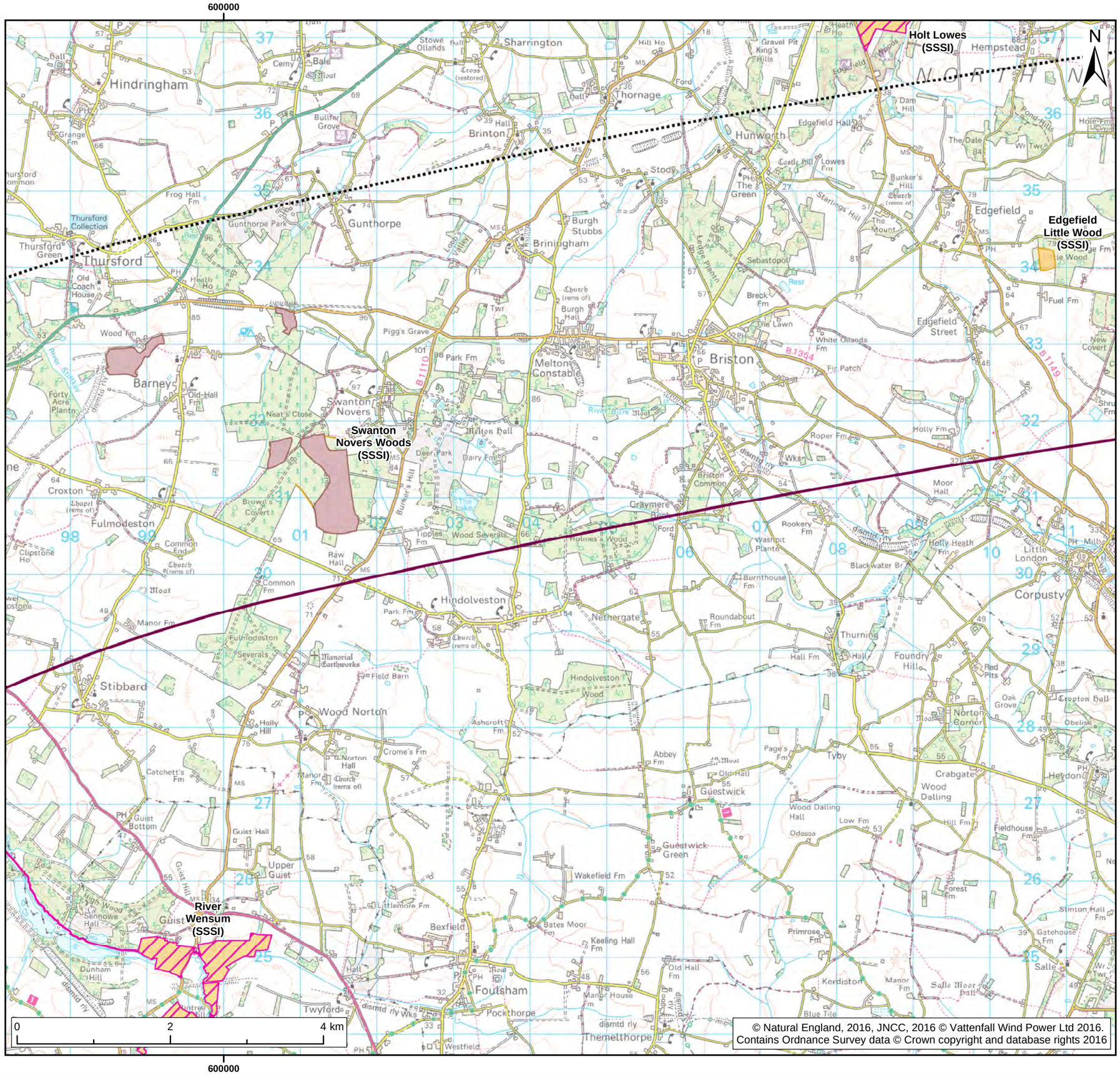

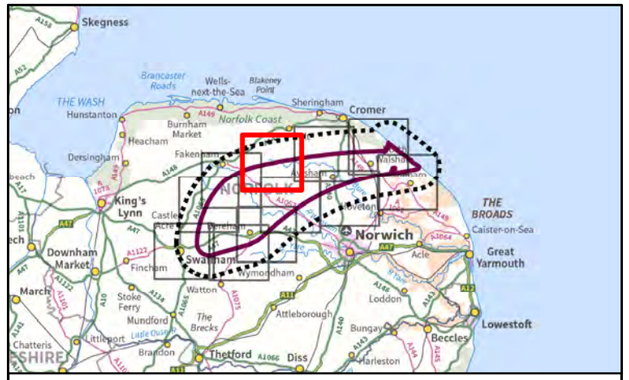

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2e | Drawing No: PB4476-DBA-002

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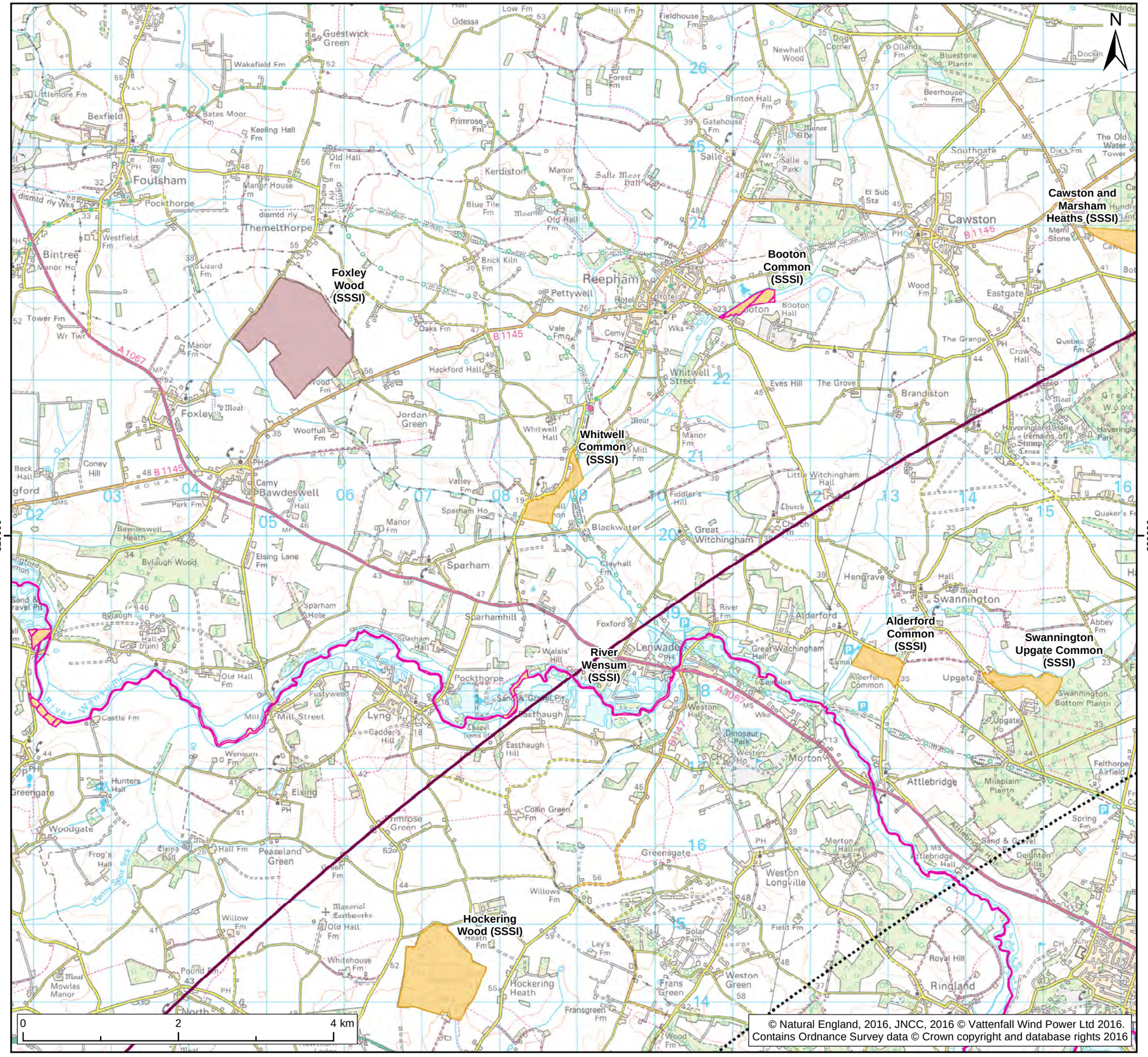

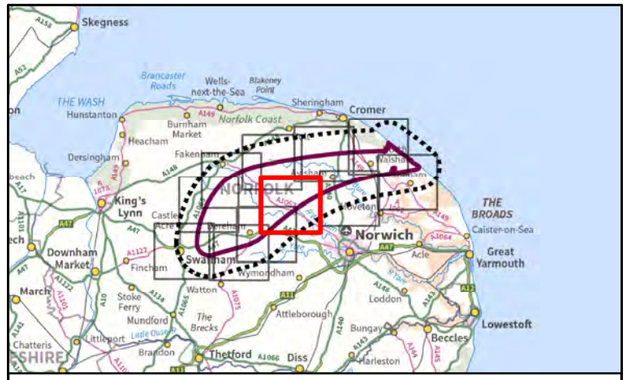

Legend:

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- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2f | Drawing No: PB4476-DBA-002

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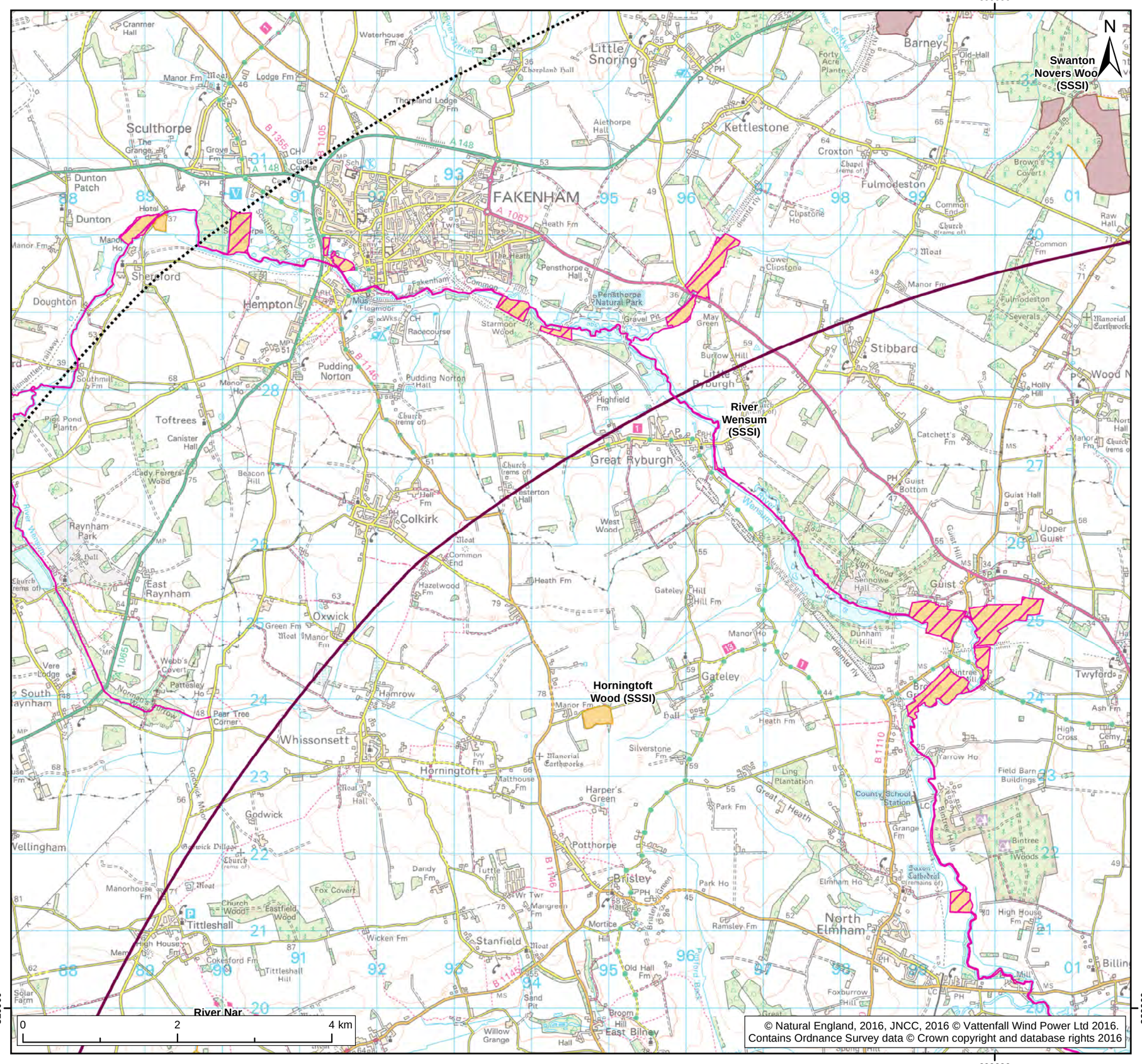

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2g | Drawing No: PB4476-DBA-002

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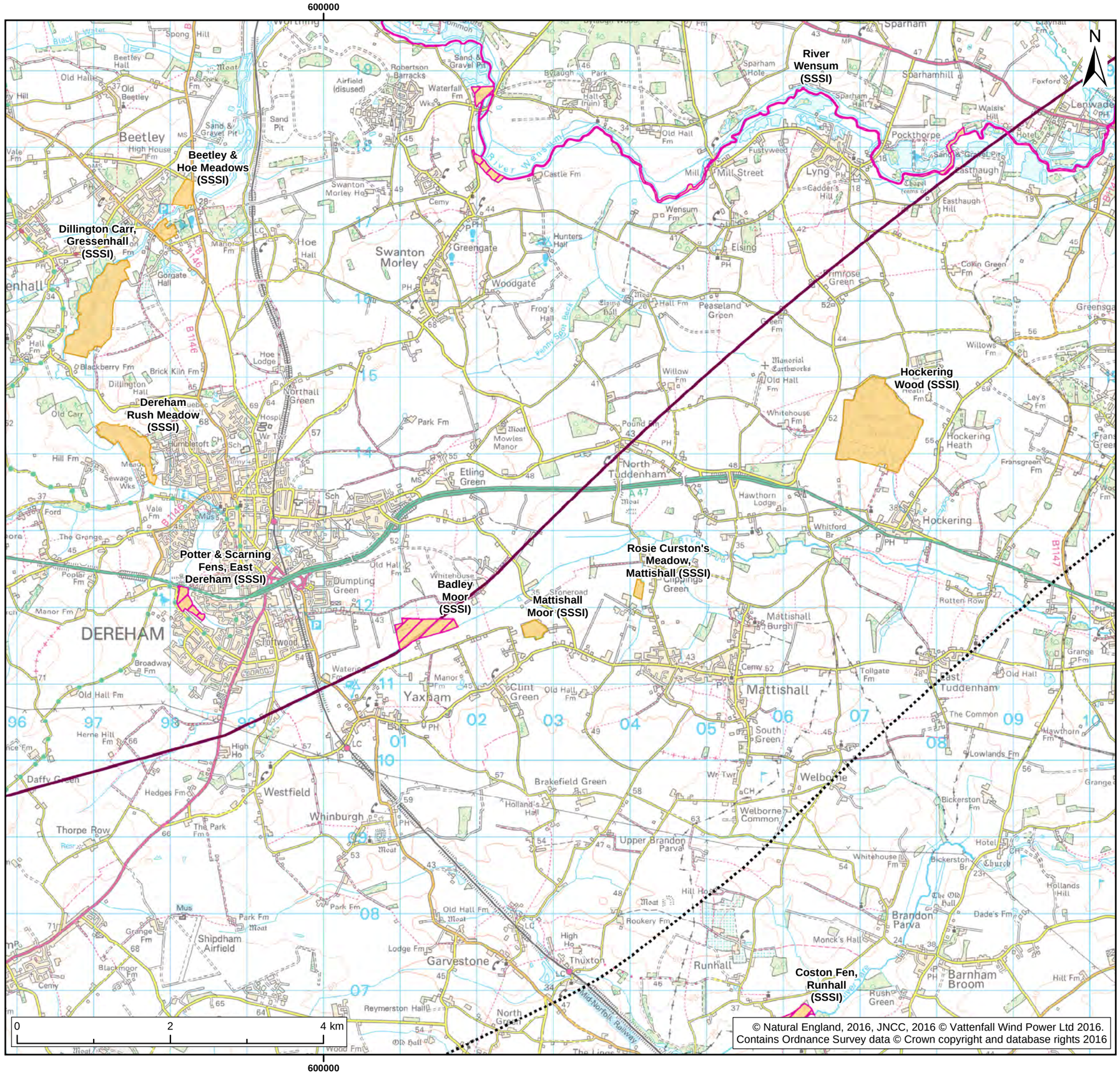

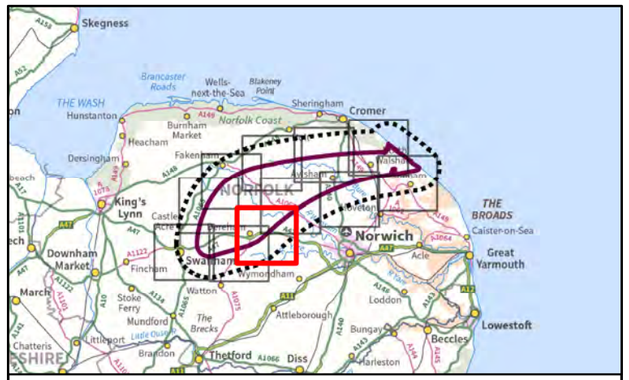

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2h | Drawing No: PB4476-DBA-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	18/08/2016	JE	GC	A3	1:50,000

Co-ordinate system: British National Grid **EPSG:** 27700

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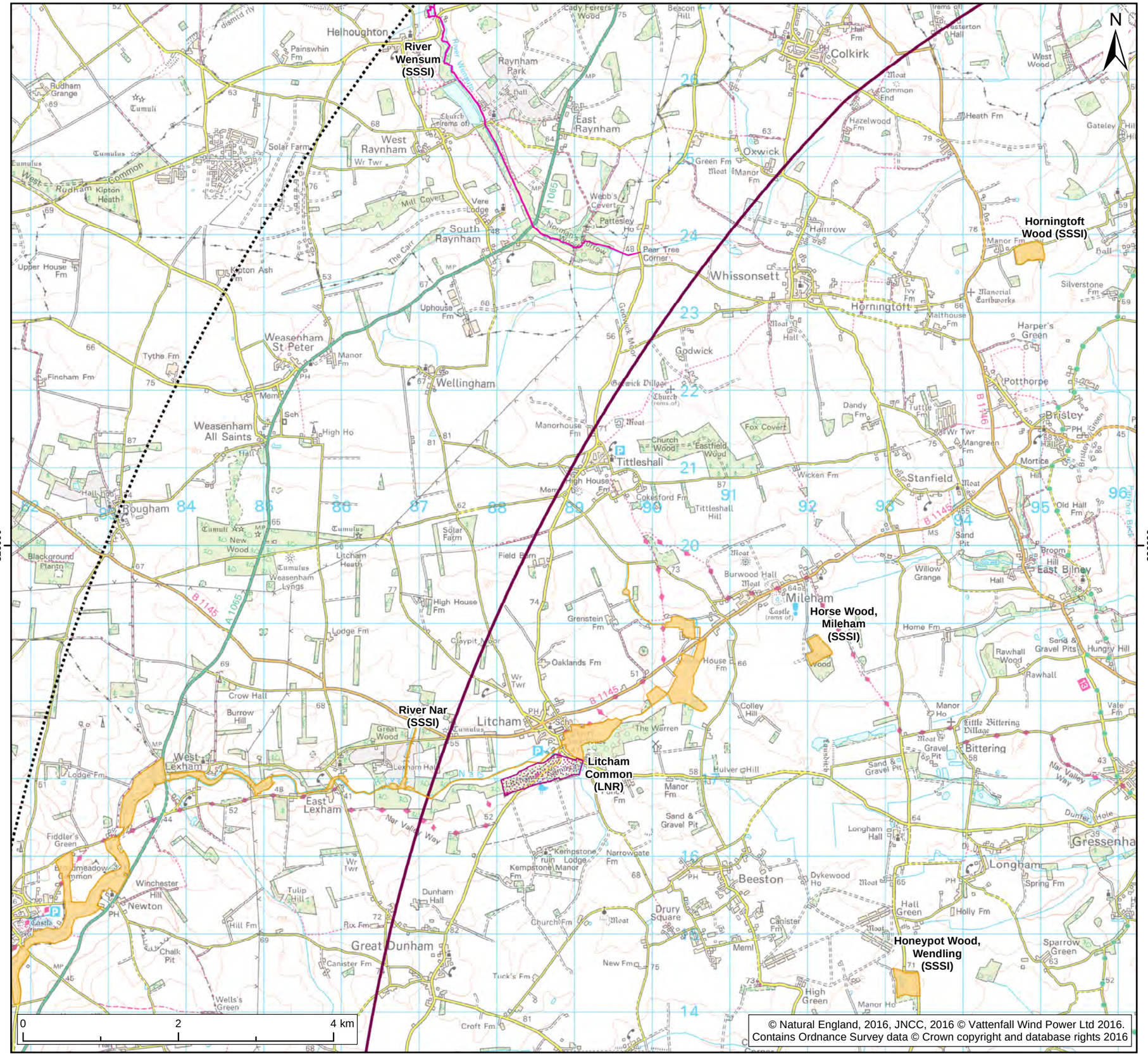

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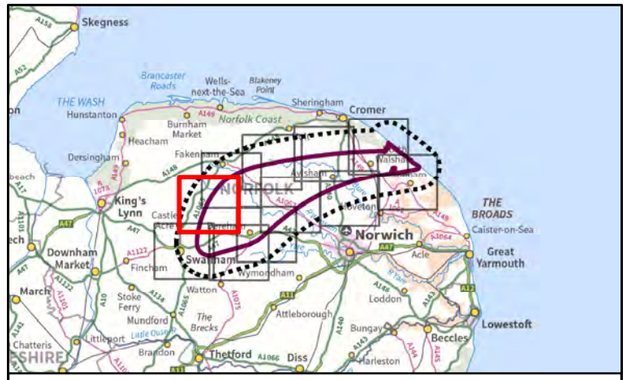

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2i | Drawing No: PB4476-DBA-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	18/08/2016	JE	GC	A3	1:50,000

Co-ordinate system: British National Grid **EPSG:** 27700

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600000

Honeypot Wood, Wendling (SSSI)

Dereham Rush Meadow (SSSI)

Holly Farm Meadow, Wendling (SSSI)

Potter & Scarning Fens, East Dereham (SSSI)

Badley Moor (SSSI)

Mattishall Moor (SSSI)

Potter's Carr, Cranworth (SSSI)

N

0 2 4 km

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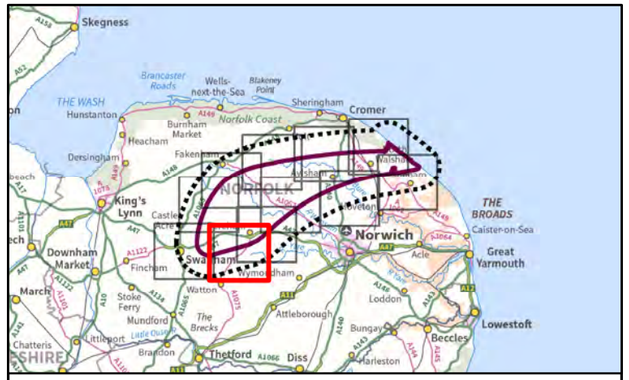
600000



Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure:	2j	Drawing No:	PB4476-DBA-002		
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	18/08/2016	JE	GC	A3	1:50,000

Co-ordinate system: British National Grid **EPSG:** 27700

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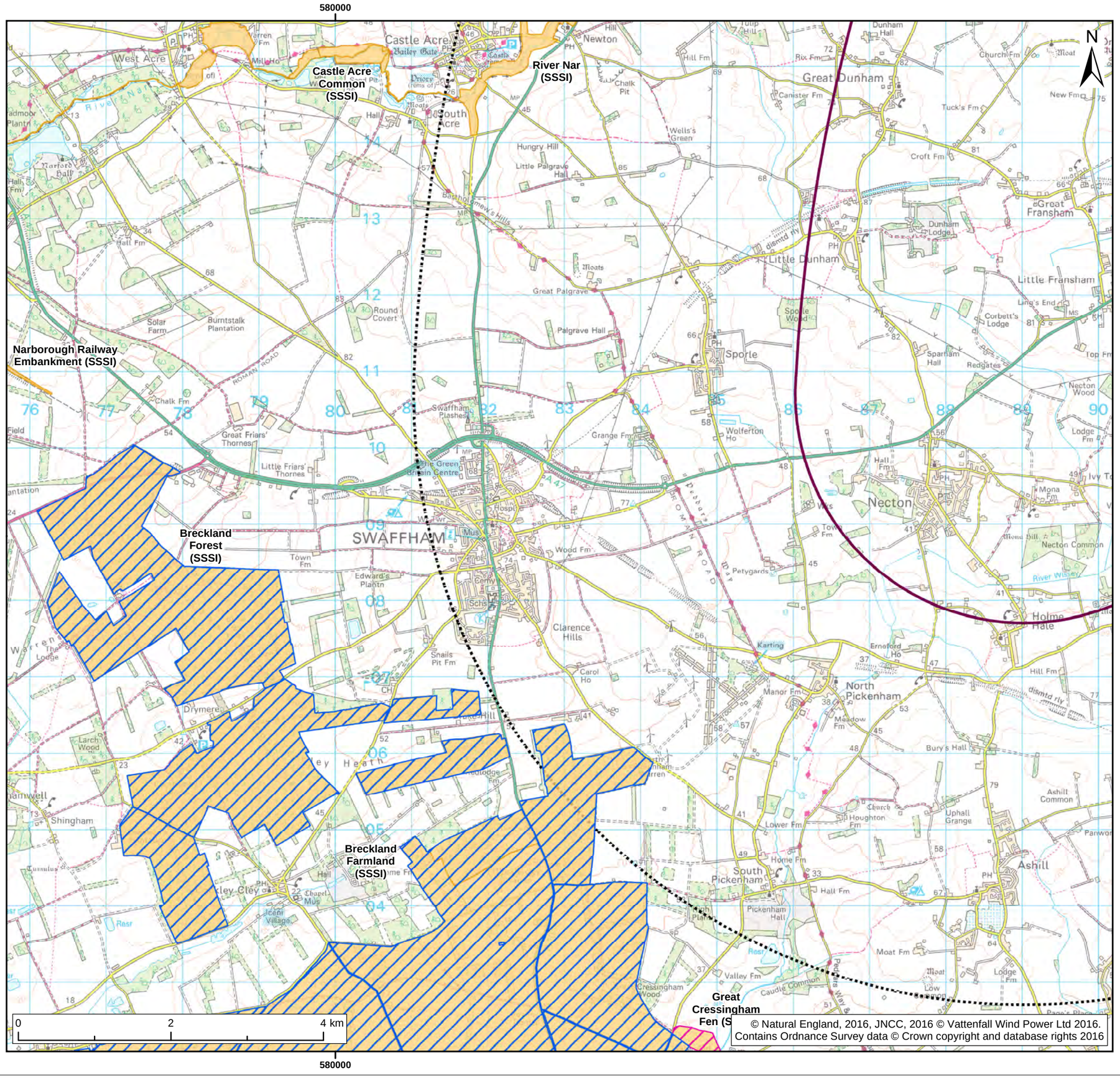

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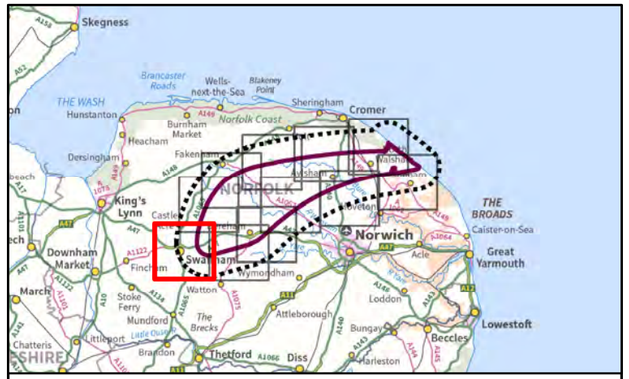

Legend:

- Onshore Scoping Area
- 5km Study Area
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Sites of Special Scientific Interest (SSSI)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Designated Sites for Nature Conservation

Figure: 2k | Drawing No: PB4476-DBA-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	18/08/2016	JE	GC	A3	1:50,000

Co-ordinate system: British National Grid **EPSG:** 27700

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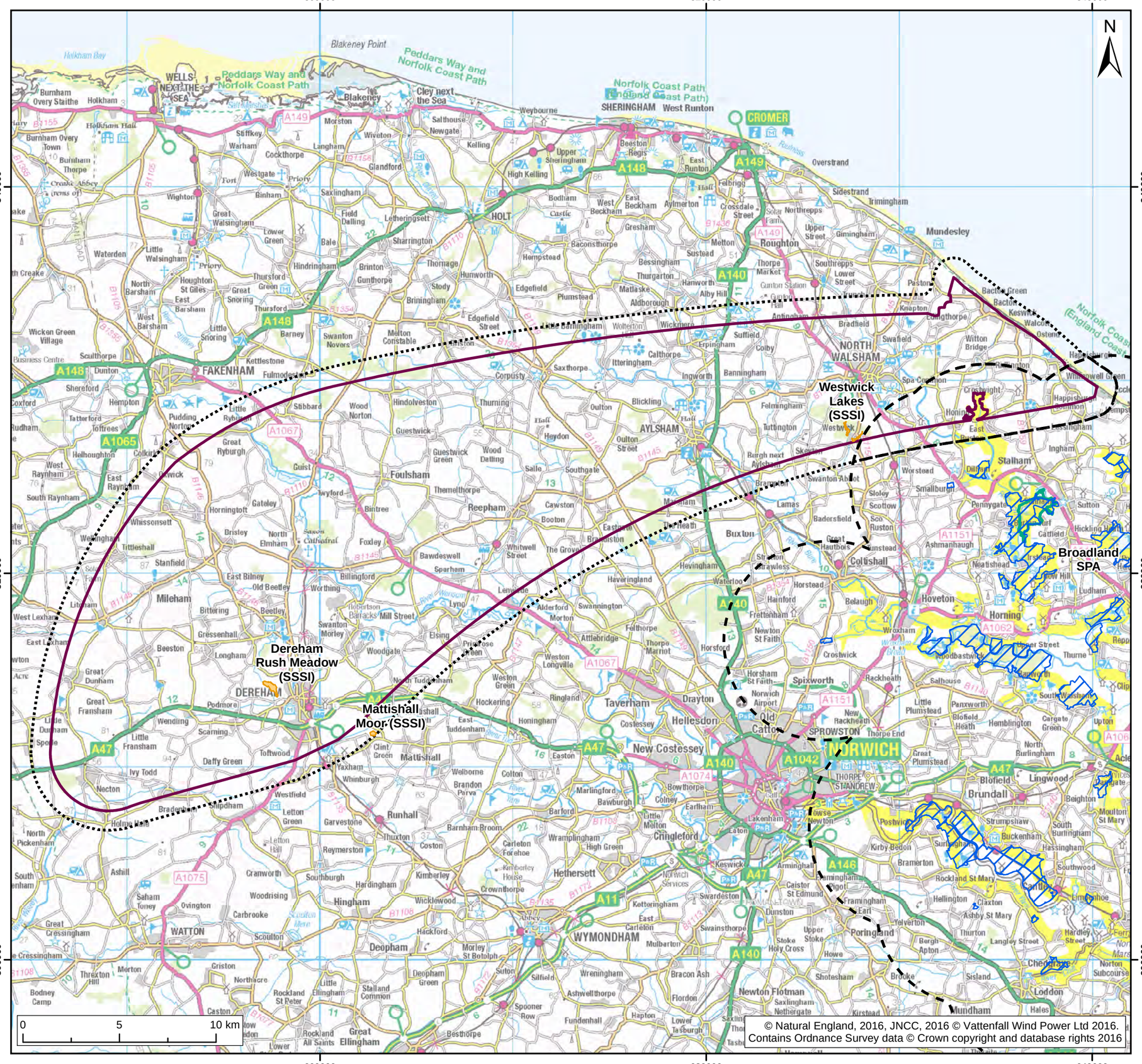

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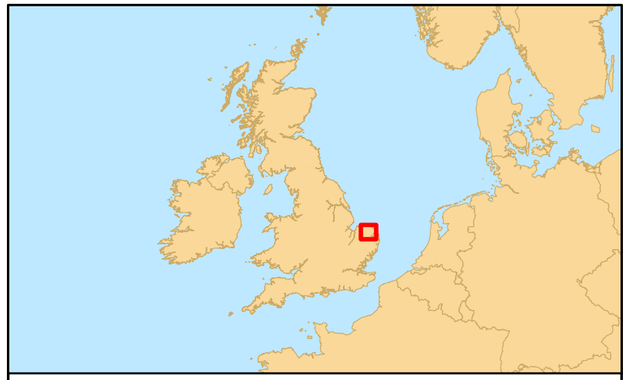

Legend:

- Onshore Scoping Area
- 1km Study Area
- Broadland SPA 5km Study Area
- Sites of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Ornithological Risk Areas

Figure: 3a Drawing No: PB4476-DBA-003

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	20/09/2016	JE	GC	A3	1:200,000
01	18/08/2016	AB	GC	A3	1:200,000

Co-ordinate system: British National Grid **EPSG:** 27700

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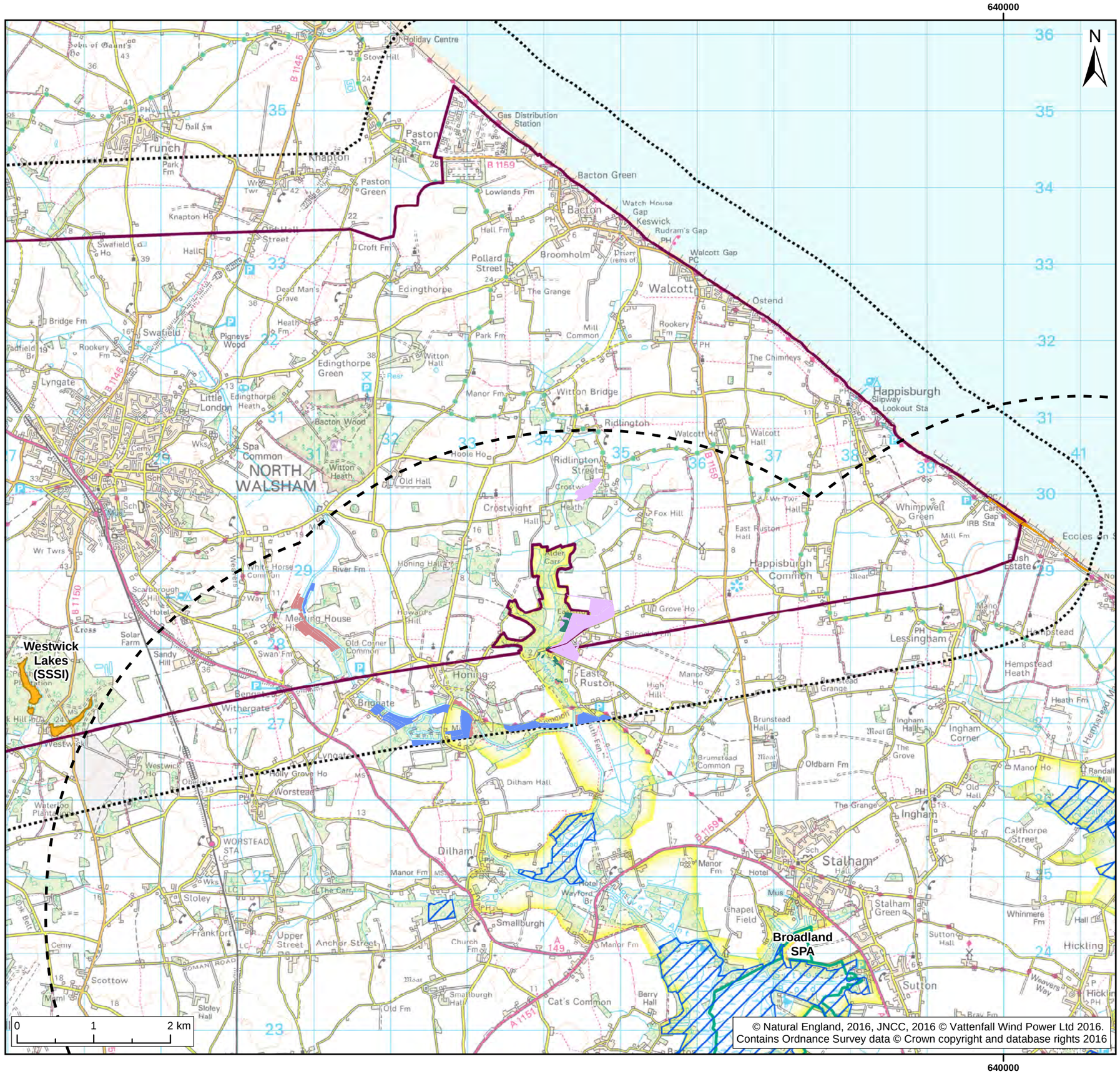

Legend:

- Onshore Scoping Area
- 1km Study Area
- Broadland SPA 5km Study Area
- Sites of Special Scientific Interest (SSSI)
- Special Protection Area (SPA)

UK Habitats of Principal Importance

- Coastal and floodplain grazing marsh
- Coastal sand dunes
- Lowland fens
- Lowland heathland
- Reedbeds

Project:	Report:
Norfolk Vanguard	Onshore Winter / Passage Bird Survey Scoping Report

Title:

Ornithological Risk Areas

Figure:	3b	Drawing No:	PB4476-DBA-003		
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	18/08/2016	AB	GC	A3	1:50,000

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