East Anglia
Offshore Wind

VATTENFALL

SCOTTISHPOWER RENEWABLES

East Anglia THREE

Chapter 24

Onshore Ornithology

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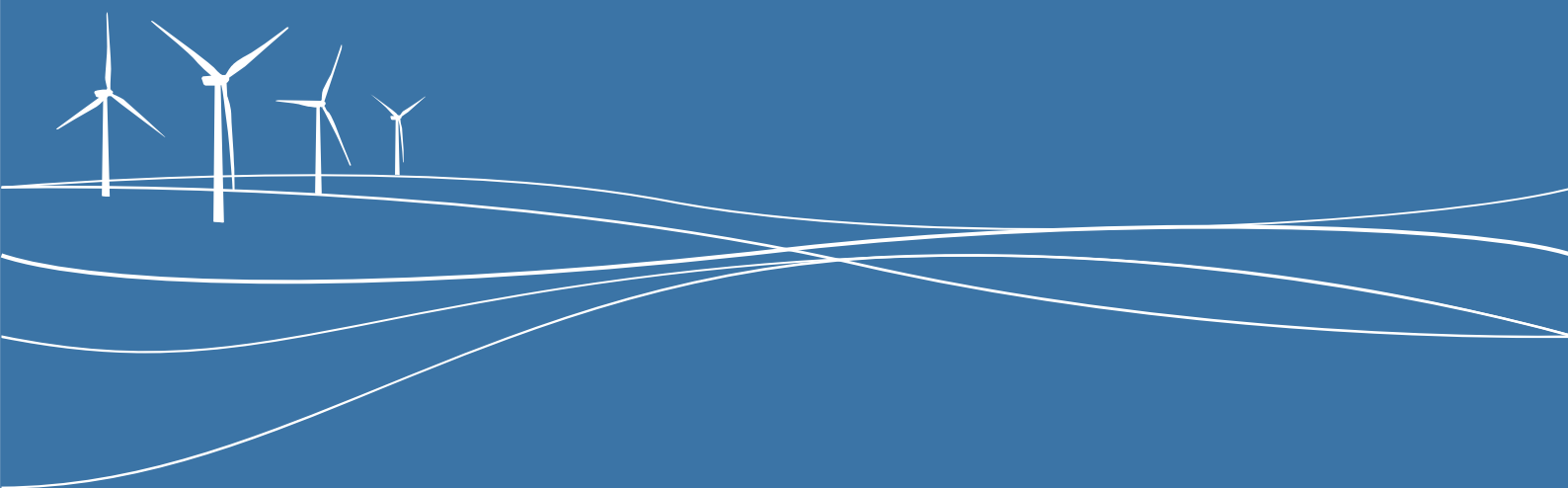

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24.6	Location of East Anglia THREE Construction Work in relation to Brent Goose Distribution 2011-12
24.7	Location of East Anglia THREE Construction Work in relation to Brent Goose Distribution 2013-14

Chapter 24 Onshore Ornithology appendices are presented in **Volume 3: Appendices** and listed in the table below.

Appendix number	Title
24.1	Baseline Onshore Ornithology Information Acquired for East Anglia ONE
24.2	Waterbird Surveys Winter 2013-14
24.3	Record of Onshore Ornithology Consultation and Statement of Common Ground for East Anglia ONE

24 ONSHORE ORNITHOLOGY

24.1 Introduction

1. This chapter has been prepared by MacArthur Green Ltd (MacArthur Green) and presents the assessment of the potential impacts on ornithological receptors that might arise from construction, operation and decommissioning of the onshore electrical transmission works of the proposed East Anglia THREE project. Onshore electrical transmission works comprise the landfall at Bawdsey, the underground transmission cables along the onshore cable route, jointing bays and kiosks, the onshore substation, and the temporary construction compounds and access tracks required to make construction possible.

2. This chapter contains:

- A summary of consultation that has been held with stakeholders;
- A description of the onshore electrical transmission works of the proposed project;
- The scope and methodology of the assessment;
- The avoidance and mitigation measures that have been embedded through project design;
- The baseline data on birds and important sites and habitats for birds acquired through desk study and survey; and
- An assessment of the potential impacts on birds and level of significance attached, including cumulative impacts.

3. Full details of the baseline data acquired through desk study and surveys are found in the appendices listed below:

- *Appendix 24.1* Baseline Onshore Ornithology Information Acquired for East Anglia ONE; and
- *Appendix 24.2* Waterbird Surveys Winter 2013-14.

24.2 Consultation

24.2.1 East Anglia ONE

4. This chapter has drawn upon the relevant information gathered and assessment carried out for East Anglia ONE. The East Anglia ONE project was subject to consultation prior to the submission of its application for consent in November 2012.

The record of consultation on the onshore ecology component of East Anglia ONE is presented in *section 24.2* of Chapter 24 Onshore Ecology and Ornithology of the East Anglia ONE Environmental Statement, and that has been reproduced as *Appendix 24.3 Record of Consultation on the Onshore Ecology Component of the East Anglia ONE Project* to this chapter.

5. The East Anglia ONE project was also subject to further consultation as part of the application process that took place between June and December 2013. An Onshore Statement of Common Ground (SoCG) (*Appendix 24.3*) was developed and agreed jointly with Suffolk County Council (SCC), Mid Suffolk District Council (MSDC), Suffolk Coastal District Council (SCDC), Natural England (NE), Environment Agency (EA), East Suffolk Internal Drainage Board (ESIDB) and Suffolk Wildlife Trust (SWT) through a series of meetings and correspondence between January and July 2013.

6. The Examining Authority's findings and conclusions and recommendation in respect of East Anglia ONE were presented in a Recommendations Report (March 2014). Conclusions relevant to ornithological matters are summarised in *Table 24.1.*

24.2.2 The proposed East Anglia THREE project

7. Detailed consultation and iteration of the overall approach to the impact assessment on ornithology receptors is on-going as part of the Evidence Plan process for the proposed East Anglia THREE project. An Ornithology Expert Technical Group (OETG) has been convened, initially involving Natural England and the Royal Society for the Protection of Birds (RSPB) and latterly including Suffolk County Council (SCC). The Schedule of Agreement and Non-agreement, forming the basis of the SoCG produced as part of the minutes to the Ornithology Expert Technical Group of the Evidence Plan is provided in *Appendix 13.1*.

8. Further consultation took place as a result of the publication of the Preliminary Environmental Information Report (PEIR) in May 2014, with formal consultee comments taking the form of a Section 42 consultation response.

9. Consultation on potential transboundary impacts involved provision of the PEIR to representative European agencies. Responses were received from the Danish Nature Agency and Dutch Rijkswaterstaat.

10. The comments arising from the consultation processes and the response made to each are summarised in *Table 24.1*.

Table 24.1 Consultation Responses

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
East Anglia ONE			
SCC, MSDC, SCDC, NE, EA, ESIDB & SWT	Onshore SoCG July 2013	Agreed in principle: • Principles of development, characterisation of baseline environment, approach to assessment, no detrimental effect on Schedule 1 birds subject to implementing mitigation, no significant cumulative impact. Not agreed [but resolved later in application process]: • Likely Significant effect on brent goose interest feature of Deben Estuary SPA	The proposed East Anglia THREE project builds on the approach that was agreed for East Anglia ONE.
The Planning Inspectorate	Recommendation Report March 2014	East Anglia THREE Limited (EATL) submitted matrices to inform the Report on the Implications for European Sites (RIES) [REP-265] at deadline II, and were subsequently updated to produce the RIES as appended to the Recommendation Report. Natural England (NE) did not express any concerns about the sites considered in the Habitat Regulations Assessment (HRA) report prepared by the applicant. During the examination, it was agreed between the applicant and NE/JNCC that the project either alone or in combination with other projects would not have a likely significant effect on the Deben Estuary SPA, subject to the implementation of measures within the Ecological Mitigation Plan (EcMP).	Noted. The proposed East Anglia THREE project draws the same conclusions in relation to European Sites (see EATL, 2015).
The Planning Inspectorate	Recommendation Report March 2014	The SoCG agreed that the proposal would not have a detrimental effect on Schedule 1 breeding species subject to the implementation of the	Noted. The proposed East Anglia THREE project draws the same conclusions in relation to Schedule 1 breeding species.

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
		mitigation agreed in the EcMP [REP-241 Appendix 4].	
East Anglia THREE Scoping			
JNCC/NE	Scoping Opinion from PINS, Dec 2012	• Defining magnitude of impact and sensitivity of receptor.	Discussed as part of Evidence Plan process and methodology given in *section 24.4.3*.
East Anglia THREE Evidence Plan			
OETG	OETG Mtg 1 Sept 2013	Areas of agreement in principle: • No further baseline surveys are required. • The assessment would be supported by recent WeBS data. • Development of mitigation action would be supported by a brent goose study. • Species to be assessed are the interest features of Deben Estuary SPA and SSSI or are Schedule 1 breeding species. Further information sought on: • Definition of magnitude. Amendment to approach such that: • SPA and SSSI Assemblage species assessed. NE noted that black-tailed godwit is likely to be an interest feature of Deben Estuary SPA after the formal review.	Agreement on topics and how unresolved issues are to be addressed was recorded in the Schedule attached to the meeting minutes. A copy is provided in *Appendix 13.1*. The areas for agreement related to onshore receptors were: • No additional baseline data collection required. • Additional WeBS counts to support baseline information. • WeBS of greater value if collect finer detail. • Agree to undertake targeted brent goose survey during baseline period. • Non-breeding season species selection – SPA & SSSI features. • Breeding season species selection - key species are Schedule 1: Cetti's warbler & marsh harrier. • Impacts to be assessed – operational impacts assessment to be brief and proportionate.
OETG	OETG Mtg 2 Nov 2013	Areas of agreement in principle: • The impacts to be assessed at each stage of the project	Agreement on topics and how unresolved issues are to be addressed was recorded in the Schedule

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
			attached to the meeting minutes. A copy is provided in *Appendix 13.1*. Within OETG Paper 2 specific sections were agreed: Para 30 (as per list in OETG Mtg 1) – Agreed Para 31 (biological periods) – Agreed in principle section 4 (potential impacts) - Agreed
OETG	OETG Mtg 3 Mar 2014	Background papers: Summary of the Brent Goose Survey 2013-14; and Summary of Waterbird Numbers from the WeBS Counts 2013-14 presented. Areas of agreement in principle: • Schedule 1 bird concerns to be addressed through the OETG and not the terrestrial ecology ETG. • The HRA high level screening process. Further information sought on: • A comparison of the totality of brent goose distribution over the two winters. Amendment to approach such that: • The Alde-Ore Estuary SPA remains screened in through the high level process.	Agreement on topics and how unresolved issues are to be addressed was recorded in the Schedule attached to the meeting minutes. A copy is provided in *Appendix 13.1*.
East Anglia THREE PEIR			
NE	Section 42 consultation 8 July 2014	It would be helpful to have further information on the operations about the norm, which are likely to occur at the Deben Estuary and over what period of time.	This is presented in Chapter 5: Description of the Development and in section 24.3.3 in relation to ornithology.
		Natural England still has concerns regarding disturbance	EATL expressed its view in OETG Meeting 3 that a

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
		to dark-bellied Brent geese associated with the Deben Estuary SPA, the lack of a refuge area and the period of non-working through winter months not extending from October to March. We advise that it is not possible to conclude no LSE at this stage, and therefore an Appropriate Assessment will be required.	restricted period between 1st November and 28/29th February was sufficient, based on brent goose site data. EATL and OETG agreed in principle during Expert Topic Group Meeting 6 (6th July 2015) that the dates proposed will be used for the restrictions (see *Appendix 13.1*). EATL (expressed in the East Anglia THREE, Section 42 Workshop, 19th March 2015) consider the provision of a refuge area is unnecessary given the commitment made to limit onshore electrical transmission works activities during the above period within the Deben Estuary. It was agreed during consultation that an Appropriate Assessment would be required for the Deben Estuary SPA (see HRA Screening document in *Appendix 13.1*). This is presented in the Information for Habitats Regulations Assessment (EAOW 2015).
		Need to discuss further the impacts to Avocet during cable construction.	This has been assessed in section 24.6.1 and as part of the HRA process, where it was scoped out during the screening process (see HRA Screening document in *Appendix 13.1.* Avocet is considered in the 24.6 Potential Impact section as part of the non-breeding wader assemblage.

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
Danish Nature Agency	Section 42 consultation	The Danish Nature Agency does not have any objections to the proposed project "Offshore Wind Farm in North Sea East Anglia Zone".	Noted.
Rijkswaterstaat	Section 42 consultation response 7 July 2014	No comment in relation to onshore ornithological aspects of East Anglia THREE.	Noted.
East Anglia THREE Evidence Plan			
OETG	OETG Mtg 4 Jul 2014	No onshore topics discussed	-
OETG	OETG Mtg 5 Jun 2015	No onshore topics discussed	-
OETG	OETG Mtg 6 Jul 2015	NE welcome that the seasonal restriction in construction activity will be captured in the SoCG and would be a condition within the Development Consent Order. NE: From the EA1 hearings there was an understanding that there would be no works over consecutive winters, EATL need to clarify what will and will not be undertaken in consecutive winters. RSPB: Work in consecutive winters should be avoided between the Deben east bank and Queens Fleet. We agree that works potentially causing disturbance should be avoided during September to March inclusive and recommend that further consideration is given to the definitions used. OETG: Clearer wording required particularly with regard to activities over multiple winters. Could wording be aligned with that agreed for EA1.	The restriction of construction activity during winter months within any year is an embedded mitigation measure for brent goose (see section 24.3.4 and Table 24.3) and has been included in the assessment for all species (section 24.6).

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
East Anglia THREE Draft ES Chapter			
NE	Advice comments Aug 2015	With reference to the [East Anglia ONE] '…implementation of measures within the Ecological Mitigation Plan (EcMP)', these measures included the provision of a refuge. Does the commitment to no winter working made in East Anglia THREE relate to East Anglia ONE too? If so it should be discussed here in relation to potential in-combination impacts. (Or not as the case may be)?	No winter working restrictions are part of the Development Consent Order (DCO) for East Anglia ONE, and this situation has been accounted for in 24.7 Cumulative Impacts.
		Are the seven temporary construction compounds mapped anywhere so they can be considered in relation to any bird interest?	See *Figure 24.3* to *Figure 24.7* for location of infrastructure in relation to key species' distributions.
		Relating to Table 24.2, 'Disturbance: Temporary, the maximum required local noise level should be included here (for both phases), particularly if there is a possibility of going into the winter period.	*Table 26.6* of Chapter 26: Noise and Vibration presents a detailed breakdown of noise levels associated with individual construction equipment. This is the same for both phases. Maximum levels are outlined in *Table 24.2*.
		Table 24.3, Onshore cable route, construction entry: Brent Geese - The wording here will need to be updated following further discussion.	Refer to OETG meeting 6 agreement on text with NE (*Appendix 13.1*) and Outline Ecological Management Strategy (OLEMS).
		With reference to the haul road required along the entire route, what proportion of this is new compared to what already exists and/or potentially created for EA ONE?	Section 24.32 Project Characteristics: During construction of the proposed East Anglia THREE project it will only be necessary to access the jointing bay locations to construct the bays themselves and pull

Consultee	Date /Document	Comment	Response / where addressed in the ES Chapter
			through the cables. Therefore, East Anglia THREE accesses are not the same as those required for East Anglia ONE. EATL will look at any opportunities to leave East Anglia ONE haul road in place between projects (East Anglia ONE and the proposed East Anglia THREE project) or phases to minimise impacts. A maximum of 17.8km of 5.5m width temporary haul road is required. Temporary track matting may be required if ground conditions are very poor.
		Are the best practise procedures referred to in operational disturbance mitigation stated anywhere (breeding and non-breeding birds)? The ecologist should also ensure mitigation is agreed and in place before work proceeds, if required.	Best practice procedures during the operational period will follow the OLEMS which contains further detail on the delivery of ecological mitigation.

24.3 Scope

24.3.1 Study Area

11. Study areas were defined that were relevant to the process being undertaken and to the ornithological receptor being considered (*Figure 24.1*). The particular study areas were:

- For the background data search: A 2km buffer around the proposed onshore electrical transmission works (see *Appendix 24.1* for further details).
- For terrestrial ecological surveys in 2011 and 2012 (as part of the East Anglia ONE application), an Extended Phase 1 Habitat Survey was carried out within the onshore cable corridor and converter station area (*Appendix 23.2*). The survey corridor (typically 160m) was extended in certain areas where there were potential constraints on the routing (e.g. road crossings). In June 2014, a further

Extended Phase 1 Habitat Survey of previously inaccessible areas was undertaken up to a 50m buffer of the proposed onshore electrical transmission works.

- For the breeding bird survey (April to June 2012) (as part of the East Anglia ONE application): A corridor predominantly of 160m width aligned on the route working width and HDD sites but widening at specific points to include habitat identified in the initial survey in April 2012 as being of greater potential value to breeding birds.

- For the winter bird surveys 2011-12 (obtained as part of the East Anglia ONE application): The survey area included the intertidal sectors of the Wetland Bird Survey (WeBS) of the Deben Estuary and low lying surrounding farmland that had the potential to support feeding dark-bellied brent goose (hereafter referred to as "brent goose"). The areas followed the sector count locations for WeBS to allow comparison between the data collected and existing data sets provided by the British Trust for Ornithology (BTO).

- For the Brent Goose Distribution and Behaviour Survey 2013-14 (part of the East Anglia THREE application): The survey area included the low lying farmland along the onshore cable route adjacent to the outer half of the Deben Estuary. This was the area for which there was evidence of significant brent goose use in previous surveys.

- For the Wetland Bird Survey 2013-14 (obtained as part of the East Anglia THREE application): The survey area included the intertidal sectors of the Wetland Bird Survey (WeBS) of the Deben Estuary and low lying surrounding farmland that had the potential to support feeding or roosting waterbirds.

12. *Figure 24.1* identifies the 2km buffer around the proposed onshore electrical transmission works (study area for the background data search), the intertidal WeBS sectors of the Deben Estuary and low lying surrounding farmland that had the potential to support feeding brent goose (study areas for Winter Bird Surveys 2011-12, Brent Goose Distribution and Behaviour Survey 2013-14 and Wetland Bird Survey 2013-14).

24.3.2 Project Characteristics

13. The Development Consent Order (DCO) for the East Anglia ONE Offshore Windfarm (June 2014) includes its offshore and onshore export cables, transition bays, the converter station at Bramford and onshore cable ducts for two further projects planned to connect to the grid at Bramford. To minimise disruption to local communities and reduce potential environmental effects, all ducting for future

projects will be installed at the same time as the cables are laid for East Anglia ONE. Cables for future projects, including the proposed East Anglia THREE project, would then be pulled through these ducts at a later date.

14. The characteristics of the proposed East Anglia THREE project are described in detail in Chapter 5 Description of the Development. The onshore electrical transmission works of the proposed project are, in summary:

- Landfall at Bawdsey with onshore transition bays to connect the offshore and onshore cables.
- Onshore cable route (approximately 37km long and approximately 75m wide)between the landfall at Bawdsey and the substation adjacent to an existing substation near Bramford. Under either the HVDC or LFAC electrical solutions up to four cables (12 single core cables in the LFAC solution in bundles of three) would be installed into four ducts.
- Up to seven temporary construction compounds (two primary and five secondary), termed Construction Consolidation Sites (CCS).
- The substation compound would cover a maximum area of 3.04ha.
- Where possible the accesses make use of existing tracks to link between the public road network and the onshore cable route. The creation of access points will generally involve one or all of the following three activities:
- The modification of existing road network;
- Upgrading of existing farm tracks; and
- Installation of haul road.
- During the construction of the proposed East Anglia THREE project it will only be necessary to access the jointing bay locations to construct the bays themselves and pull through the cables. Therefore, East Anglia THREE accesses are not the same as those required for East Anglia ONE. EATL will look at any opportunities to leave East Anglia ONE haul road in place between projects (East Anglia ONE and the proposed East Anglia THREE project) or phases to minimise impacts. A maximum of 17.8km of 5.5m width temporary haul road is required. Temporary track matting may be required if ground conditions are very poor.
- Main construction activities will involve transport to site, cable pulling and jointing at the jointing bays.

- Reinstatement of land.

24.3.3 Worst Case

15. There are two approaches for the construction of the proposed East Anglia THREE project:

    - Single Phase - a single phase (up to 1200MW installed in a single construction period); or
    - Two Phased - two phases of up to 600MW each, with the start date of each phase of works separated by no more than 18 months).

16. Ducts (including all horizontal directional drilling (HDD) operations) for the onshore cables for the proposed East Anglia THREE project will be installed during the construction of East Anglia ONE.

17. Therefore, under the Single Phase approach, for construction of the proposed East Anglia THREE project the following works would be required:

    - If the short duct method if used at the landfall, a ramp would be required to access the beach;
    - Creation of one transition bay compound near to the landfall location;
    - Installation of one transition bay compound to connect the offshore shore export cables and the onshore export cables;
    - Installation of up to two jointing bays (assuming up to two cables are jointed in each bay) at up to 62 locations along the cable route;
    - Creation of one jointing bay construction compound at up to 62 locations along the onshore cable route, each with a hardstanding area of 775m^2 within a compound of 3,740m^2.
    - CCS – seven sites covering an aggregated area of up to 1.32ha;
    - Access via existing roads and tracks and therefore haul road is required only where joints are placed in remote areas. A maximum of 18.05km of 5.5m width haul road is required. Temporary track matting may be required if ground conditions are very poor;
    - Transport to site, cable pulling and jointing at up to 124 (each with 2 cables so 248 joints) jointing bays;
    - Installation of up to 248 kiosks for cable maintenance;

- Up to 300m of open trenching for cables from the end of pre-installed ducts to the substation(s);
- One substation within a 3.04ha compound;
- Up to 235m of open trenching for cables from the substation(s) to ducts pre-installed by National Grid; and
- Reinstatement of land.

18. Under a Two Phased approach the following works would be required:

- If the short duct method if used at the landfall, a ramp would be required to access the beach;
- Creation of two transition bay compounds (one during each Phase) near to the landfall location;
- Installation up to two transition bay compounds (one during each Phase) each to house up to two joints between the offshore export cables and the onshore export cables;
- Creation of two jointing bay construction compounds (one during each Phase) at up to 62 locations along the onshore cable route;
- Installation of up to two jointing bays (assuming two cables are jointed in each bay in each in Phase 1 and two jointed in each bay in Phase 2) at up to 62 locations along the cable route, each with a hardstanding area of 775m^2 within a compound of 3400m^2;
- CCS – seven sites covering an aggregated area of up to 1.32ha;
- Access via existing roads and tracks and therefore haul road is required only where joints are placed in remote areas. A maximum of 18.05km (of 5.5m width) haul road is required. Temporary track matting may be required if ground conditions are very poor. As a worst case scenario, it is assumed that all haul road will be removed and the ground reinstated on completion of Phase 1 and will be replaced and then removed again during Phase 2;
- Transport to site, cable pulling and jointing at up to 124 (62 during Phase 1 and 62 during Phase 2) (each with 2 cables so 248 joints) jointing bays;
- Installation of up to 248 kiosks for cable maintenance;

- Up to 300m of open trenching for cables from the end of pre-installed ducts to the substation(s);
- Up to two substation(s) within a 3.04ha compound;
- Up to 235m of open trenching for cables from the substation(s) to ducts pre-installed by National Grid; and
- Reinstatement of land.

19. Full details of the Single Phase and Two Phased approaches are provided within Chapter 5 Description of the Development.

20. The final routeing of cables connecting into the substation is not known at the current time. Therefore the pre-installed ducts will end just beyond the western boundary of the screening trees and bunding installed by East Anglia ONE to the east of the East Anglia THREE substation. Therefore the final stretch of cables will be open trenched from the end of the ducts to the substation. This will be a maximum distance of 300m. Likewise, National Grid will install ducts to connect into the existing Bramford substation but these will end at the boundary of the National Grid land, therefore EATL will need to open trench up to the end of these ducts, a distance of up to 235m. In both cases the cables would be laid directly into trenches.

21. As discussed in Chapter 5 Description of the Development (section 5.6.6.2.2) East Anglia THREE Limited (EATL) will investigate opportunities to leave haul road in place between projects and/or phases to further minimise impacts, this would be dependent upon the agreement of individual landowners and the approval of the local planning authorities. EATL consider that for onshore ornithology it would be more disruptive for all receptors to install and remove haul road twice under the Two Phased approach due to the increased disturbance to the ground, than to leave it in situ. In addition, given that locations where haul road would be left in place is dependent upon individual landowner decisions and local authority approval, at this stage it is not possible to determine where this may occur and which receptors would be affected. Therefore, this potential case is not assessed independently as it is considered that the impacts of leaving the haul road in situ between phases falls within the magnitude of effects assessed under the two construction approaches presented.

22. For each impact, the assessment utilises a worst case approach for both the Single Phase and Two Phased approach to construction described above. The design parameters that constitute worst case vary depending on the potential impact under consideration. *Table 24.2* below details the assumptions used.

23. Only those design parameters with the potential to influence the level of impact are identified here. Therefore, if the design parameter is not described in the table below, it is not considered to have a material bearing on the outcome of the assessment.

24. The worst case scenarios identified here are also applied to the cumulative impact assessment (CIA). When the worst case scenarios for the project in isolation do not result in the worst case for cumulative impacts, this is addressed within the cumulative section of this chapter (see section *24.7*).

25. All potential impacts are assessed in accordance with the Chapter 6 EIA Methodology.

Table 24.2 Worst Case Scenario Parameters

Impact	Key Rationale design parameters forming the realistic worst case scenario	Rationale
Construction		
All impacts	• Single Phase ○ Footprint = area of haul road, maximum 62 x jointing bay construction compounds (each containing 775m^2 of hardstanding), substation compound and 7 Construction Consolidation Sites (CCS) = 37.85ha ○ Permanent habitat loss at substation compound = 3.04ha ○ Onshore Cable Route - duration of works = 29 weeks ○ Substation - duration of works 55 weeks • Two Phased ○ Footprint = area of haul road (laid twice), maximum 124 x jointing bay construction compounds (each containing 775m^2 of hardstanding), substation compound and 7 CCS = 67.05ha ○ Permanent habitat loss at substation compound = 3.04ha ○ Onshore Cable Route - duration of works = 29 weeks, a gap of up to months then further 29 weeks. ○ Substation - duration of works = 123 weeks. Typical distances between jointing bays are between 500 and 1,000m.	Values provided within Chapter 5 Description of the Development
Habitat loss: Temporary	• Single Phase ○ Temporary habitat loss: works will be staggered along the onshore cable route over the maximum 29 week construction period, before habitat reinstatement of temporary haul roads. • Two Phased Temporary habitat loss: Phase 2 is estimated to last for approximately the same time period as Phase 1 and therefore, with a gap of up to 5 months between phases. It is assumed here that habitat reinstatement of temporary haul roads occurs	

Impact	Key Rationale design parameters forming the realistic worst case scenario	Rationale
	after Phase 2, but there will be insufficient time for reinstatement of suitable habitat between phases.	
Disturbance: Temporary	• Single Phase ○ Noise (shall not exceed the maximum required local level which is to be provided by the local authorities) and lighting at substation compound, 7 CCS and potentially 62 jointing bays. 24 hour working may be required at CCS. ○ Noise levels range from 62dB (generator at jointing bays) to 86dB for dozer and grader at CCS/haul road and substation ($L_{Aeq\ @\ 10m}$ values, at 10m from source). ○ Construction period lasting up to 29 weeks (one breeding or non-breeding season, or partial breeding and non-breeding seasons). ○ Jointing operations would take up to 10 days spread over a four to six working week period, with up to five workers for each jointing bay. ○ Up to 50 construction personnel associated with each of the 11 sections of the onshore cable route at peak periods of activity on that section. • Two Phased ○ Noise (shall not exceed the maximum required local level which is to be provided by the local authorities) and lighting at substation compound, 7 CCS and potentially 124 jointing bays. 24 hour working may be required. ○ Noise levels range from 62dB (generator at jointing bays) to 86dB for dozer and grader at CCS/haul road and substation ($L_{Aeq\ @\ 10m}$ values, at 10m from source). ○ Construction period lasting up to 58 weeks (two breeding or non-breeding seasons, or partial combinations of both). Following the completion and reinstatement of Phase 1 construction there would be a period of up to 5 months where no works were carried out. Phase 2 is estimated to last for approximately the same time period as Phase 1 and therefore the total time from the start of phase to the completion of Phase 2 would be up to 63 weeks. ○ In each phase, jointing operations would take up to 10 days spread over a four to six working week period, with up to five workers for each jointing bay. ○ Up to 30 construction personnel associated with each of the 11 sections of the onshore cable route at peak periods of activity on that section.	Values provided within the project details. Also see Chapter 26 Noise and Vibration
Operation		
Habitat loss	• Both approaches ○ Permanent habitat loss at substation compound = 3.04ha (covered in construction impacts). In the vicinity of the jointing bays each cable would have a kiosk	Ranges provided within project details.

Impact	Key Rationale design parameters forming the realistic worst case scenario	Rationale
	to provide access for testing and maintenance. These may be required at each jointing bay location (i.e. at 62 locations) therefore there would be a maximum of 248 kiosks (under Two Phased approach) along the onshore cable route. Each kiosk would be 1m x 0.75m x 1m high.	
Disturbance: Temporary	One visit per jointing bay per year plus non-scheduled maintenance if required, could take place in between jointing bays or kiosk locations.	Ranges provided within project details.
Disturbance: Permanent	• Both approaches ○ Noise emissions attributable to the substation shall not result in a noise level which exceeds 35dB L_{Aeq} 5min at Bullenhall Farm, Hill Farm and Woodlands Farm ○ 24 hour Lighting at substation compound ○ Disturbance through routine operations at substation compound and occasional maintenance along the onshore cable route. Substation column and building mounted lighting and noise	Ranges provided within project details.
Decommissioning		
All impacts	• Both approaches ○ Buried cable system: Cables de-energised and left in situ; ○ Jointing bays left in situ; ○ Dismantling and removal of above ground electrical equipment; ○ Substation removed and land returned to initial state; ○ Removal of any building services equipment; ○ Demolition of the buildings and removal of security fences; ○ Removal of hard standing; ○ Landscaping and reinstatement of the site; and ○ Presence of plant and vehicles (see Chapter 27 Traffic and Transport).	Ranges provided within project details.

24.3.4 Embedded Mitigation

26. A summary of mitigation measures which are embedded into the project design and are relevant to onshore ornithology are listed in *Table 24.3*. In that Table the general mitigation measures, which would apply to all parts of the onshore electrical transmission works, are set out first. Below that the mitigation measures are set out which would apply specifically to the landfall, the onshore cable route and the substation location.

27. The process of submitting an application for East Anglia ONE has allowed mitigation measures to be developed in consultation with relevant stakeholders and for a

specific set of measures to be agreed with those stakeholders (Onshore SoCG with SCC, MSDC, SCDC, Natural England, EA, ESIDB and SWT). Those measures to be applied to East Anglia ONE have been included within the proposed East Anglia THREE project as embedded mitigation.

Table 24.3 Embedded Mitigation Relating to Onshore Ornithology

Parameter	Mitigation Measures Embedded in the Project Design
General	
Project design	Initial routeing and site selection to avoid key sensitive land uses and habitats. This routeing was undertaken as part of the work for East Anglia ONE. Use of cable ducts installed during the construction of East Anglia ONE
Pre-construction	Pre-construction surveys in relation to Annex 1 and Schedule 1 birds undertaken by suitably qualified ecologists to ensure mitigation is based upon up-to-date survey data. Removal of any vegetation prior to construction during the non-breeding season if within footprint and close to any previously recorded Schedule 1 nest sites.
Construction	Minimisation of the construction footprint, including reduced working width of 35m at all hedgerows and watercourse crossings where possible and habitat removal restricted to the minimum working width of 35m at watercourse crossings where practicable. Jointing bays located close to field boundaries but away from sensitive features such as hedgerows (>5m), trees and watercourses (>10m). A Code of Construction Practice (CoCP) for the onshore works including specific measures to be put in place when working in or near designated habitats or locations supporting Schedule 1 breeding birds and non-breeding birds that are interest features of relevant SPAs and/or SSSIs. CoCP to be developed and agreed in consultation with Natural England and Local Planning Authorities. Development of an Outline Landscape and Ecological Management Strategy (OLEMS) that is a subsidiary plan of the CoCP, and contains further detail on the delivery of ecological mitigation, including that relating to Schedule 1 breeding birds and non-breeding interest features of the Deben Estuary SPA. The OLEMS to be developed and agreed in consultation with Natural England and Local Planning Authorities. A summary of the relevant measures of the OLEMS is provided below.
Landfall	
Project design	The use of HDD techniques at the landfall will occur during the construction of East Anglia ONE. The construction of the proposed East Anglia THREE project at the landfall would be restricted to cable pulling and construction of transition bays.
Onshore cable route	

Parameter	Mitigation Measures Embedded in the Project Design
Project design	Careful routeing of the onshore cable route to avoid designated sites. Cable ducts pre-installed during East Anglia ONE construction. Onshore cable route installed underground, eliminating bird collision risk (constructed as part of East Anglia ONE). Specific watercourse crossings, including that of Martlesham Creek and The Deben Estuary, undertaken by HDD techniques (constructed as part of East Anglia ONE). No requirement for 24 hour lighting is anticipated except that associated with trenchless crossings and at the CCS. Habitat removal would, where practicable, be restricted to the minimum working width of 5.5m at watercourse crossings.
Construction	Pre-construction surveys for Schedule 1 birds to ensure mitigation is based on up-to-date survey data (procedures outlined in OLEMS). During periods of construction works, from the 1st November to 28/29th February the only activities to be undertaken at the east side of the Deben Estuary (i.e. between Ferry Road and the Deben Estuary) would be: • Walk-over site investigation or survey works; or • Any inspections required to assess the integrity, safety and security of [EATL] assets; or • Any response required for the purposes of ensuring the health, safety and security of employees, contractors and the general public, unless otherwise agreed with Natural England. Access by vehicle would be from either Access B or Access C (but not from both simultaneously to ensure that any disturbance is localised). See OLEMS for details. Pollution prevention measures will be implemented in accordance to Environment Agency Pollution Prevention Guidance. An Ecological Clerk of Works (ECoW) will undertake compliance monitoring on site during construction. Reinstatement following cable installation to include: • Reinstatement following cable installation to include: • Reinstatement of bank profiles; • Retain and relay vegetation to ditch sides; • Bank and bed materials removed for construction would be stored separately and replaced in the reverse order in which they were removed, to promote the re-establishment of appropriate habitat; and • Reinstatement of affected field boundaries and hedges in the same style or with the same species mix of the original and / or to match adjacent boundaries for up to five years.
Decommissioning	Onshore cable would be decommissioned (de-energised) and the cables left in-situ.
Substation	
	No additional mitigation

28. The Outline Landscape and Ecological Management Strategy (OLEMS) referred to in *Table 24.3* lists a series of mitigation and management measures that will be embedded within the construction of the proposed project. The OLEMS for the proposed East Anglia THREE project is based upon those mitigation and management measures already contained in the OLEMS submitted for East Anglia ONE. The mitigation and management measures can be divided into two categories – those that are relevant to terrestrial ecological interest features and those that are being specifically implemented for the Deben Estuary SPA interest features and birds that are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (W&C Act) (all other non-Schedule 1 species receive general protection under the W&C Act).

29. The mitigation and management measures that are relevant to the Deben Estuary SPA interest features and birds that are protected under Schedule 1 of the W&CAct have been developed to follow a hierarchy that is:

- Baseline surveys;
- Embedded mitigation;
- Pre-construction surveys;
- Targeted habitat management (e.g. removal of vegetation prior to construction);
- Activity and personnel restrictions;
- Ecological Clerk of Works monitors throughout construction; and
- Activity and personnel restrictions in response to findings of Ecological Clerk of Works.

30. Within that hierarchical approach, the OLEMS details:

- During periods of construction works, from the 1st November to 28/29th February the only activities to be undertaken at the east side of the Deben Estuary (i.e. between Ferry Road and the Deben Estuary) would be:
- Walk-over site investigation or survey works; or
- Any inspections required to assess the integrity, safety and security of [EATL] assets; or

- Any response required for the purposes of ensuring the health, safety and security of employees, contractors and the general public, unless otherwise agreed with Natural England.

31. Access by vehicle would be from either Access B or Access C (but not from both simultaneously to ensure that any disturbance is localised).

- If the results of baseline and pre-construction survey data this identify regular nesting of marsh harrier or Cetti's warbler (or any other breeding Schedule 1 species) along the line of the onshore cable route (that is, within the DCO Order Limits) then a targeted habitat management measure will be employed. This will be to make all suitable marsh harrier nesting vegetation within the 75 m onshore cable route construction activities unsuitable for nesting, and/or to make all suitable Cetti's warbler nesting vegetation beyond 10m of where surface ground works are to take place (subject to that still being within the DCO 'red line' boundary), by strimming the vegetation to ground level outside of the bird nesting period (that nesting period is March to August inclusive). Any regrowth during the following spring and summer, and before construction starts, will be kept to below the height that it will be attractive to nesting birds by regular strimming.

- If that nesting location and section of cable route is within 200 m of a known concentration of feeding brent goose then that vegetation clearance will be limited to being carried out in the months of September to November inclusive. This is in order to avoid disturbance to brent goose in a period later in the winter when they are more dependent on feeding on agricultural land.

- Monitoring of marsh harrier and Cetti's warbler (or any other breeding Schedule 1 species) fortnightly from mid-March to the end of June to establish if breeding is taking place. If breeding does commence those surveys will continue (potentially at more frequent intervals) to the completion of that nesting attempt. Additional species-specific restrictions would be implemented if nesting occurs close to construction activity. Restrictions would constitute an exclusion area for specified activities around the nest of between 25m and 400m radius, depending on species present, stage of nesting activity, and type of construction activity involved.

24.4 Assessment Methodology

24.4.1 Legislation, Policy and Guidance

24.4.1.1 Legislation

32. *Table 24.4* identifies the relevant legislation and summarises the important measures derived from it.

Table 24.4 Legislation and relevant measures

Legislation	Relevant Measures
Habitats Directive - Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora	This Directive provides a framework for the conservation and management of natural habitats, wild fauna (except birds) and flora in Europe. The relevant provisions of the Directive are the identification and classification of Special Areas of Conservation (SACs) (Article 4) and procedures for the protection of SACs and Special Protection Areas (SPAs) (Article 6). SACs are identified based on the presence of natural habitat types listed in Annex I and populations of the species listed in Annex II. The Directive requires national Governments to establish SACs and to have in place mechanisms to protect and manage them. The procedures for the protection of SACs and SPAs are implemented in the UK for onshore sites 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 Special Protection Areas (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 Article6 provisions of the Habitats Directive.
Wildlife and Countryside Act 1981	The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. It provides protection for all birds and establishes the system of Sites of Special Scientific Interest (SSSI).
Natural Environment and Rural Communities Act 2006	This Act imposes a duty on public bodies to conserve biodiversity, including a requirement to compile a list of habitats and species of principal importance for the purpose of conserving biodiversity.

Legislation	Relevant Measures
The Conservation of Habitats and Species Regulations 2010	The Conservation of Habitats and Species Regulations 2010, (hereafter called the 'Habitats Regulations') transposes the Birds Directive and the Habitats Directive into national law in the onshore environment, operating in conjunction with the Wildlife and Countryside Act 1981. The Habitats Regulations place an obligation on 'competent authorities' to carry out an appropriate assessment of any proposal likely to affect a SAC or SPA, to seek advice from Natural England and / or JNCC, and to not approve an application that would have an adverse effect on a SAC or SPA (except under very tightly constrained conditions that involve decisions by the Secretary of State).

24.4.1.2 Policy

33. *Table 24.5* identifies the relevant policy and summarises the important measures derived from it.

Table 24.5 Policy and relevant measures

Policy	Relevant Measures
Overarching NPS for Energy (NPS EN-1) (July 2011)	Paragraph 5.3.3 states that the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. Paragraph 5.3.4 states that the applicant should also show how the project has taken advantage of opportunities to conserve and enhance biodiversity interests. Paragraph 5.3.18 states that the applicant should include appropriate mitigation measures as an integral part of the proposed development.
NPS for Renewable Energy Infrastructure (NPS EN-3) (July 2011)	Paragraph 2.6.63 states that the effects of offshore wind farms can include temporary disturbance during the construction phase, on-going disturbance during the operational phase and direct loss of habitat. Paragraph 2.6.64 states that the assessment of ecology and biodiversity should be undertaken by the applicant for all stages of the lifespan of the proposed offshore wind farm. Paragraph 2.6.65 states that consultation on the assessment methodologies should be undertaken at early stages with the statutory consultees as appropriate.
NPS for Electricity Networks Infrastructure (NPS EN-5) (July 2011)	This provides additional information concerning onshore grid connections, but relates mainly to overhead transmission lines. Paragraph 2.7.2 of the document states that particular consideration should be given to bird feeding and hunting grounds, migration corridors and breeding grounds.

Policy	Relevant Measures
National Planning Policy Framework	The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. The document establishes a number of core land-use planning principles that should underpin both plan-making and decision-taking, including contributing to conserving and enhancing the natural environment. Paragraph 109 states that "the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures".
Local Development Frameworks	These establish the local planning policies. Relevant documents identified are: Mid Suffolk District Council: Core Strategy - Development Plan Suffolk Coastal District Council: Local Development Framework Mid Suffolk District Council: Mid Suffolk Local Plan.
UK Post-2010 Biodiversity Framework	The 'UK Post-2010 Biodiversity Framework' succeeds the UK Biodiversity Action Plan. The Framework demonstrates how the work of the four countries and the UK contributes to achieving the Aichi Biodiversity Targets, and identifies the activities required to complement the country biodiversity strategies in achieving the targets.
Suffolk Biodiversity Plan	Developed by the Suffolk Biodiversity Partnership and currently has 21 Habitat Action Plans and 262 Species Action Plans.

24.4.1.3 Guidance

34. The most relevant guidance on EIA for terrestrial ecology receptors, including birds, is the *Guidelines for Ecological Impact Assessment (EcIA) in the UK* published by the Institute of Ecology and Environmental Management (IEEM 2006). The EIA methodology described in *section 24.4.3* and applied in this Chapter is based on that IEEM guidance.

24.4.2 Data Sources

24.4.2.1 Desk based assessment

35. The desk based assessment has drawn on a wide variety of published literature, covering both peer reviewed scientific literature and the 'grey literature' such as windfarm project submissions and reports.

36. Information on statutory sites and their interest features has been drawn from the web-based resource Multi-Agency Geographic Information for the Countryside (MAGIC - www.magic.defra.gov.uk) and the Natural England and JNCC web sites (www.naturalengland.org.uk; www.jncc.defra.gov.uk).Information on non-statutory

sites, species and any other additional details that may be relevant to the project, were requested from a range of data sources including but not limited to Suffolk Biological Records Centre, Suffolk Wildlife Trust and county recorders. Additional sources used included the BTO. The search area used was up to 2km around the proposed onshore electrical transmission works.

24.4.2.2 Site Specific Surveys

37. Ecological scoping surveys were undertaken in September and October 2011 and February to April 2012, with an updated survey in previously inaccessible areas in June 2014. The surveys comprised extended Phase 1 Habitat Survey including assessment of habitat for protected species. The aim of these surveys was to identify habitats of conservation value or suitable for protected species and where further survey effort was required.

38. Winter bird surveys were undertaken from October 2011 to March 2012. The aim of these surveys was to identify areas (both intertidal and terrestrial) used by concentrations of waterbirds and to quantify use in relation to season and state of the tide. The details and results of these surveys is provided in *Appendix 24.1*.

39. Breeding bird surveys were carried out in April to June 2012. The aim of these surveys was to identify concentrations of breeding birds and the breeding locations of particular species, including Schedule 1 birds (see *Appendix 24.1*).

40. The local WeBS co-ordinator was contracted to undertake a Brent Goose Distribution and Behaviour Survey over the 2013-14 winter. This was in response to a request made by Natural England at Evidence Plan Meeting 1 in September 2013 (see *Appendix 13.1*).The aim of this survey was to provide a finer level of detail on the distribution of brent goose than had been obtained by earlier waterbird surveys and from existing WeBS data and to obtain information on the response of brent goose to existing sources of disturbance. The surveys were undertaken between October 2013 and February 2014.The report on those brent goose surveys is provided in *Appendix 24.2*.

41. The existing volunteer WeBS count team continued their programme of monthly high tide counts of the waterbirds of the Deben Estuary over the winter 2013-14 and this data was provided for this impact assessment. The report on those WeBS surveys for October 2013 to April 2014 is provided in *Appendix 24.2*.

24.4.3 Impact Assessment Methodology

42. The impact assessment methodology applied in this chapter is based on that described in Chapter 6 EIA Methodology but adapted to make it applicable to ornithology receptors and aligned with the key guidance document produced on

impact assessment on ecological receptors (IEEM 2006). The impact assessment methodology applied in this chapter has also been the subject of extensive consultation with Natural England and RSPB through the Evidence Plan process (see *Table 24.1* and *Appendix 24.3*).

43. The assessment approach uses the conceptual 'source-pathway-receptor' model. The model identifies likely environmental impacts resulting from the proposed construction, operation and decommissioning of the onshore infrastructure. This process provides an easy to follow assessment route between impact sources and potentially sensitive receptors ensuring a transparent impact assessment. The parameters of this model are defined as follows:

- Source – the origin of a potential impact (noting that one source may have several pathways and receptors) i.e. an activity such as digging the jointing bays and subsequent construction of jointing bays.
- Pathway – the means by which the effect of the activity could impact a receptor e.g. for the example above, a line of sight to the working machinery.
- Receptor – the element of the receiving environment that is impacted e.g. for the above example, brent goose feeding on the low-lying farmland.

24.4.3.1 Sensitivity

44. *Table 24.6* provides example definitions of the different sensitivity levels for ornithology receptors using as its example the potential impact of disturbance through construction activity.

Table 24.6 Example Definitions of the Different Sensitivity Levels for Ornithology Receptors

Sensitivity	Definition
High	Bird species has very limited tolerance of sources of disturbance such as noise, light and the sight of people
Medium	Bird species has limited tolerance of sources of disturbance such as noise, light and the sight of people
Low	Bird species has some tolerance of sources of disturbance such as noise, light and the sight of people
Negligible	Bird species is generally tolerant of sources of disturbance such as noise, light and the sight of people

45. It should be noted that high conservation value (defined below) and high sensitivity are not necessarily linked within a particular impact. A receptor could be of high conservation value (e.g. an interest feature of a SPA) but have a low or negligible

physical/ecological sensitivity to an effect and vice versa. Potential impact significance will not be inflated simply because a feature is 'valued'. Similarly, potentially highly significant impacts will not be deflated simply because a feature is not 'valued'. The narrative behind the assessment is important here; the conservation value of an ornithological receptor can be used where relevant as a modifier for the sensitivity (to the effect) already assigned to the receptor.

24.4.3.2 Conservation Value

46. The conservation value of ornithological receptors will be ranked according to the following scale:

- International;
- National;
- County; and
- Local (within the zone of influence of the proposed project only).

47. *Table 24.7* provides for each an example based on sites with ornithology interest features.

Table 24.7 Example Definitions of the Conservation Value Levels for Ornithology Receptors

Value	Example Definition
International	A species which is present within the Study Area in numbers of greater than 1% of the international population.
National	A species which is present within the Study Area in numbers of greater than 1% of the national population.
County	A species which is present within the Study Area in numbers of greater than 1% of the county population.
Local	Any other species which is present in the Study Area in smaller numbers than above.

24.4.3.3 Magnitude

48. The definitions of the magnitude levels for ornithology receptors are set out in *Table 24.8*.This set of definitions has been determined on the basis of changes to bird populations.

Table 24.8 Definitions of the Magnitude Levels for Ornithology Receptors

Magnitude	Definition
High	A change in the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site that is predicted to irreversibly alter the population in the short-to-long term and to alter the long-term viability of the population and / or the integrity of the protected site. Recovery from that change predicted to be achieved in the long-term (i.e. more than 5 years) following cessation of the development activity.
Medium	A change in the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site that occurs in the short and long-term, but which is not predicted to alter the long-term viability of the population and / or the integrity of the protected site. Recovery from that change predicted to be achieved in the medium-term (i.e. no more than five years) following cessation of the development activity.
Low	A change in the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site that is sufficiently small-scale or of short duration to cause no long-term harm to the feature / population. Recovery from that change predicted to be achieved in the short-term (i.e. no more than one year) following cessation of the development activity.
Negligible	Very slight change from the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site. Recovery from that change predicted to be rapid (i.e. no more than circa 6 months) following cessation of the development related activity.
No change	No loss of, or gain in size or extent of distribution of the relevant biogeographic population or the population that is the interest features of a specific protected site.

24.4.3.4 Impact significance

49. Following the identification of the receptor value and sensitivity and the determination of the magnitude of the effect, the significance of the impact will be determined. That determination will be guided by the matrix as presented in *Table 24.9*.Impacts shaded red or orange represent those with the potential to be significant in EIA terms.

Table 24.9Matrix to Guide Determination of Impact Significance

Sensitivity	Magnitude				
	High	Medium	Low	Negligible	No change
High	Major	Major	Moderate	Minor	No Impact
Medium	Major	Moderate	Minor	Negligible	No Impact
Low	Moderate	Minor	Minor	Negligible	No Impact
Negligible	Minor	Negligible	Negligible	Negligible	No Impact

50. It is important that the matrix is seen as a framework to aid understanding of how a judgement has been reached from the narrative of each impact assessment and it is not a prescriptive formulaic method. Expert judgement has been applied to the assessment of likelihood and ecological significance of a predicted impact. For the purpose of this assessment the IEEM (2010) guidance has been followed, which states that an ecologically-significant impact is:

'an impact that has a negative, or positive, effect on the integrity of a site or ecosystem and/or the conservation objectives for habitats or species populations within a given geographical area. In this way significant impacts are distinguished from other, lesser (and, in the context of EIA, unimportant) effects'

24.4.4 Project Design Envelope

51. *Section 3.5* of Chapter 3 Policy and Legislative Context provides a background to the project design envelope approach.

52. The project design envelope sets out a series of design options for the project. The project design envelope has a reasoned minimum and maximum extent for a number of key parameters. The final design would lie between the minimum and the maximum extent of the consent sought, for all aspects of the project, this includes spatial, temporal and installation methodology. The project design envelope is used to establish the extent to which the project would impact on the environment. The detailed design of the project could then vary within this 'envelope' without rendering the assessment inadequate.

24.4.5 Cumulative Impact Assessment

53. The impact assessment methodology applied in this chapter is based on that described in Chapter 6 EIA Methodology but adapted to make it applicable to ornithology receptors.

54. The method applied does not use the 'tiered approach' that was developed by Natural England and JNCC for cumulative and in-combination assessments of plans and projects potentially affecting ornithological receptors in the offshore environment. This is because the situation onshore is less complex and the 'tiered approach' is not considered necessary.

55. The cumulative impact assessment method assumes that during the East Anglia ONE cable construction work ducts are installed ready for the cables for the proposed East Anglia THREE project to be pulled through.

24.4.6 Transboundary Impact Assessment

56. The transboundary impact assessment methodology applied in this chapter is based on that described in Chapter 6 EIA Methodology but adapted to make it applicable to ornithology receptors.

57. The potential for transboundary impacts will be identified by consideration of potential linkages to non-UK protected sites and sites with large concentrations of breeding, migratory or wintering birds (including by the use of available information on tagged birds).

24.5 Existing Environment

58. This Section details the baseline ecological information based on the desk based assessment and the surveys listed above.

59. A summary of the ornithological receptors potentially affected by the onshore cable route and their value is provided at the end of this section in *Table 24.13*.

24.5.1 Statutory Designated Sites

60. A list of statutory sites within 2km of the onshore cable route that have listed ornithology features of interest is given in *Table 24.10*. Those sites are listed in order of increasing distance from the onshore cable route. The location of those sites is also illustrated in *Figure 24.2*.

Table 24.10 Statutory Designated Sites and their Ornithological Interest Features

Site	Ornithological Interest Features	Distance (km)*
Deben Estuary SPA	Classified for its populations of non-breeding (wintering) brent goose and avocet	0
Deben Estuary Ramsar Site	Listed for its population of brent goose at levels of international importance.	0

Site	Ornithological Interest Features	Distance (km)*
Deben Estuary SSSI	Notified for its populations of overwintering waders and wildfowl including redshank in numbers of international importance, brent goose, shelduck and black-tailed godwit in numbers of national importance (with wigeon, pintail and grey plover approaching this level in some years). The estuary also supports high numbers of dunlin, curlew and mute swan. The redshank breeding population is of county importance.	0
Outer Thames Estuary SPA	A marine SPA classified for an important non-breeding population of red-throated diver. This site is below the mean low water mark and is not crossed by the onshore cable route and is therefore considered in the offshore assessment (see Chapter 13 Offshore Ornithology).	0
Newbourn Springs SSSI	Notified for its breeding birds (including nightingale, goldcrest, warblers and woodpeckers) and migratory birds (including *Sylvia* warblers and fieldfare).	0.35
Alde-Ore Estuary SPA	Classified for its populations of breeding marsh harrier, avocet, lesser black-backed gull, little tern and sandwich tern and non-breeding (wintering) redshank, ruff and avocet.	1.2
Alde-Ore Estuary Ramsar Site	Listed for its notable assemblage of breeding and wintering wetland birds with breeding lesser black-backed gull and wintering avocet and redshank at levels of international importance.	1.2
Alde-Ore Estuary SSSI	Notified for its populations of breeding avocet, gadwall, shoveler, oystercatcher, ringed plover, common tern, Arctic tern, sandwich tern, little tern, common gull, black-headed gull, lesser-black-backed gull, herring gull short-eared owl, wheatear and marsh harrier. Also notified for its non-breeding (wintering and migration) populations of waders and wildfowl including Bewick's swan, shelduck, teal, wigeon, redshank and avocet.	1.2

* Table Note: The distance listed is the shortest distance between the site and the onshore electrical transmission works.

61. The assessment of likely significant effect on the interest features of the internationally designated sites (SPAs and Ramsar sites) is carried out through the Habitats Regulations Assessment (HRA) process and this is reported separately in the Information for Habitats Regulations Assessment (EAOW 2015).

24.5.2 Breeding Birds

62. The background data search identified 151 bird species within the 2km search area that were either listed as red or amber conservation concern within Birds of Conservation Concern 3 (Eaton *et al*. 2009), listed as a UK Biodiversity Action Plan (UKBAP) or Suffolk Local Biodiversity Action Plan (LBAP) species, listed in Annex I of the Birds Directive or listed in Schedule 1 of the Wildlife and Countryside Act, 1981. The full list is presented in *Appendix 24.1.*

63. Breeding surveys were undertaken across the onshore cable route and the converter station location. The survey programme was one survey carried out in April 2012 of the entire length of the proposed onshore cable route and substation in order to characterise habitats that would be affected, the general assemblage of birds using the route and to identify key areas of habitat that would require more detailed survey. Two further visits were then carried out in May 2012 and June 2012 targeted at fifteen areas of habitat identified in April 2012. These targeted locations were agreed with Natural England, RSPB and Suffolk County Council.

64. Ninety-four species were recorded from within the areas surveyed. Seventy two species were confirmed breeding, probable breeding or possible breeding species. Of all the bird species recorded, 53 are listed on Annex 1 of the EU Birds Directive (Birds Dir. Annex 1), Schedule 1 on the Wildlife and Countryside Act 1981 (WCA Sched. 1) or are included on the red or amber lists of the Birds of Conservation Concern (BoCC). A total of 21 species are listed as Priority Species in the Suffolk Local Biodiversity Action Plan. These species are listed in *Table 24.11*. Full details are provided within *Appendix 24.1*.

Table 24.11Breeding Birds of Conservation Concern Recorded in the Survey Area during Breeding Bird Surveys in 2012.

Common Name	Scientific Name	Conservation Status	Breeding Status in Survey Area
Shelduck	*Tadorna tadorna*	BoCC Amber	Confirmed Breeding
Teal	*Anas crecca*	BoCC Amber	Possible Breeding
Mallard	*Anas platyrhynchos*	BoCC Amber	Confirmed Breeding
Pochard	*Aythya farina*	BoCC Amber	Confirmed Breeding
Tufted Duck	*Aythya fuligula*	BoCC Amber	Possible Breeding
Grey Partridge	*Perdix perdix*	BoCC Red; UKBAP; LBAP	Possible Breeding
Little Grebe	*Tachybaptus ruficollis*	BoCC Amber	Possible Breeding
Little Egret	*Egretta garzetta*	Birds Dir Annex 1; BoCC Amber	Non Breeding
Marsh Harrier	*Circus aeruginosus*	Birds Dir Annex 1; WCA Sched 1; BoCC Amber	Confirmed Breeding
Kestrel	*Falco tinnunculus*	BoCC Amber	Probable Breeding
Hobby	*Falco Subbuteo*	WCA Sched 1	Possible Breeding
Oystercatcher	*Haematopus ostralegus*	BoCC Amber	Non Breeding
Lapwing	*Vanellus vanellus*	BoCC Red; UKBAP; LBAP	Probable Breeding

Common Name	Scientific Name	Conservation Status	Breeding Status in Survey Area
Black-tailed Godwit	*Limosa limosa*	WCA Sched 1;BoCC Red; UKBAP; LBAP	Non Breeding
Curlew	*Numenius arquata*	BoCC Amber; UKBAP; LBAP	Non Breeding
Spotted Redshank	*Tringa erythropus*	BoCC Amber	Non Breeding
Redshank	*Tringa totanus*	BoCC Amber	Non Breeding
Black-headed Gull	*Chroicocephalus ridibundus*	BoCC Amber	Non Breeding
Common Gull	*Larus canus*	BoCC Amber	Non Breeding
Lesser Black-backed Gull	*Larus fuscus*	BoCC Amber	Non Breeding (flying over only)
Herring Gull	*Larus argentatus*	BoCC Red; UKBAP; LBAP	Non Breeding (flying over only)
Great Black-backed Gull	*Larus marinus*	BoCC Amber	Non Breeding
Little Tern	*Sternula albifrons*	Birds Dir Annex 1;WCA Sched 1;BoCC Amber; LBAP	Non Breeding (flying over only)
Common Tern	*Sterna hirundo*	Birds Dir Annex 1;BoCC Amber	Non Breeding (flying over only)
Stock Dove	*Columba oenas*	BoCC Amber	Confirmed Breeding
Turtle Dove	*Streptopelia turtur*	BoCC Red; UKBAP; LBAP	Possible Breeding
Cuckoo	*Cuculus canorus*	BoCC Red; UKBAP; LBAP	Probable Breeding
Barn Owl	*Tyto alba*	WCA Sched 1; BoCC Amber; LBAP	Possible Breeding
Swift	*Apus apus*	BoCC Amber; LBAP	Non Breeding (flying over only)
Kingfisher	*Alcedo atthis*	Birds Dir Annex 1;WCA Sched 1; BoCC Amber	Non Breeding (flying over only)
Green Woodpecker	*Picus viridis*	BoCC Amber	Probable Breeding
Skylark	*Alauda arvensis*	BoCC Red; UKBAP; LBAP	Probable Breeding
Sand Martin	*Riparia riparia*	BoCC Amber	Non Breeding (flying over only)
Swallow	*Hirundo rustica*	BoCC Amber	Non Breeding (flying over only)

Common Name	Scientific Name	Conservation Status	Breeding Status in Survey Area
House Martin	*Delichon urbicum*	BoCC Amber	Non Breeding (flying over only)
Meadow Pipit	*Anthus pratensis*	BoCC Amber	Possible Breeding
Yellow Wagtail	*Motacilla flava*	BoCC Red; UKBAP; LBAP	Confirmed Breeding
Grey Wagtail	*Motacilla cinerea*	BoCC Amber	Possible Breeding
Dunnock	*Prunella modularis*	BoCC Amber; UKBAP; LBAP	Probable Breeding
Nightingale	*Luscinia megarhynchos*	BoCC Amber	Possible Breeding
Song Thrush	*Turdus philomelos*	BoCC Red; UKBAP; LBAP	Probable Breeding
Mistle Thrush	*Turdus viscivorus*	BoCC Amber	Probable Breeding
Cetti's Warbler	*Cettia cetti*	WCA Sched 1	Probable Breeding
Whitethroat	*Sylvia communis*	BoCC Amber	Confirmed Breeding
Willow Warbler	*Phylloscopus trochilus*	BoCC Amber	Possible Breeding
Marsh Tit	*Poecile palustris*	BoCC Red; UKBAP; LBAP	Probable Breeding
Starling	*Sturnus vulgaris*	BoCC Red; UKBAP; LBAP	Possible Breeding
House Sparrow	*Passer domesticus*	BoCC Red; UKBAP; LBAP	Possible Breeding
Linnet	*Carduelis cannabina*	BoCC Red; UKBAP; LBAP	Confirmed Breeding
Crossbill	*Loxia curvirostra*	WCA Sched 1	Non Breeding
Bullfinch	*Pyrrhula pyrrhula*	BoCC Amber; LBAP	Probable Breeding
Yellowhammer	*Emberiza citrinella*	BoCC Red;UKBAP; LBAP	Probable Breeding
Reed Bunting	*Emberiza schoeniclus*	BoCC Amber; LBAP	Probable Breeding

65. The onshore cable route footprint is mainly agricultural land but has areas of coastal, estuarine and wetland habitats, grassland, woodland, scrub and hedgerows. The general agricultural land supports a range of species and there are certain parcels of land that support some important breeding species.

66. The survey information has identified that the route supports seven high value areas and a number of rare or scarce breeding species. Most of the species of conservation concern (as defined by being BoCC red or amber listed) recorded along this route are species that are common and widespread in Suffolk but that have undergone significant declines in breeding population nationally.

67. The following key breeding bird habitat areas were identified:

- **Bawdsey, Alderton and Ramsholt Marshes** - A large area of agricultural land intersected by numerous ditches and a larger fleet containing a linear reedbed. It is just inland from the coast and is adjacent to the River Deben. The area is notable as it supports large numbers of a few species of conservation concern. The agricultural fields are used by large numbers of the ground nesting species.
- **Falkenham Marsh** - An area like Bawdsey, Alderton and Ramsholt Marshes, of agricultural land intersected with ditches; however it is not as wet. It is just to the west of the River Deben. Falkenham Marsh is particularly notable for the breeding wildfowl present in the large ditch adjacent to the River Deben.
- **Wetland South of Hemley**–This area comprises an area of agricultural land with a river and several ditches. The area is between two woodlands; Shepherds Wood and The Thicket.
- **Martlesham Creek Area** - This area comprises the intertidal creek and fields to the north, which are intersected by ditches, hedgerows and a railway line.
- **Wetland area east of Bramford Road**–This area comprises a river, cattle grazed pasture fields intersected by ditches, pools formed by flood water, mature outgrown hedges and stands of mature oaks and poplars.
- **Millers Wood**–A wood at the western end of the route, just to the north east of the existing substation. It is oak woodland with a sparse understory and is notable for supporting woodland species.
- **Area around the existing substation** -The existing substation is at the far western end of the cable route. It is surrounded by agricultural land and is then almost completely enclosed by surrounding woodland. The agricultural land is particularly notable for the large number of yellowhammers. The surrounding woodlands support breeding species such as marsh tit and tawny owl. Fore Grove woodland also has a large rookery.

68. Those ornithological receptors identified in the desk based assessment and specific surveys that are to be screened in for further, detailed assessment are those species that are listed in Schedule 1 of the Wildlife and Countryside Act, occur along or adjacent to the onshore cable route in the breeding season and the surveys identified them as of probable or confirmed breeding status. This approach was agreed in consultation with Natural England and the RSPB during the Evidence Plan process (*Table 24.1 and Appendix 13.1*). These species have been termed the 'Key Breeding Bird Species' in this Chapter. The following section provides a summary of each species' status locally and nationally and their conservation value.

- **Marsh Harrier** - A rare breeding bird in the UK. Musgrove *et al*. (2013) estimates that there are 320-380 pairs breeding in the UK. The 2009 Rare Breeding Birds in the UK Report (Holling *et al*. 2011) states 55 pairs were confirmed to breed in Suffolk, with a further six pairs unconfirmed.

- During baseline surveys, one confirmed breeding pair of marsh harrier was recorded within an area crossed by the cable route (for details see *Appendix 24.1* and *Confidential Figure 24.3*). It was considered possible that a second pair could have attempted to breed in this area. A further wetland area also possibly supports one pair of marsh harriers although no nesting was confirmed. This area would be crossed by HDD methods during the East Anglia ONE construction.

- Based on the National and County figures the one confirmed breeding pair recorded on this route represents up to 0.3% of the National total and 1.6% of the County total. With the potential for three breeding pairs along the route, this would represent 0.9% of the National total and 4.9% of the County total. On this basis one breeding pair is important at the county level but not at the national level.

- **Cetti's Warbler** - A rare breeding bird in the UK. The 2009 Rare Breeding Birds in the UK Report (Holling *et al*. 2011) states up to 2,347 territorial males in the UK, of which 223 were recorded in Suffolk (the county with the second highest number recorded).

- Cetti's Warbler males were recorded holding territory in two wetland areas (*Confidential Figures 24.4 and 24.5*). Both of these locations would be crossed by HDD methods during the East Anglia ONE construction.

- Based on these figures the seven singing males recorded on this route represent 0.29% of the National total and 3% of the County total. On this basis, seven territorial males are important at the county level but not at the national level.

69. In addition to the valuation of the Key Breeding Bird Species above, the overall breeding bird assemblage within the onshore cable route is considered of County value and has been assessed as a receptor.

24.5.3 Non-breeding (Wintering) Birds

70. Surveys of the Deben Estuary and adjacent low lying farmland were undertaken between October 2011 and March 2012 to record bird numbers, location and behaviour using pre-defined count sectors to ensure data is compatible with WeBS counts. Full details of methods and results are provided in *Appendix 24.1 Baseline*

Onshore Ornithology Information Acquired for East Anglia ONE.A study was undertaken in winter 2013-14 to record brent goose distribution and behaviour in response to existing disturbance. In addition, WeBS counts of the Deben Estuary were obtained during the 2013-14 season. Full details of methods and results of these further surveys are provided *Appendix 24.2 Waterbird Surveys Winter 2013-14*.

71. A total of 51 waterbird species and four species of bird of prey were recorded from within the surveyed areas. Of the waterbird species recorded, 43 are listed on Annex 1 on the EU Birds Directive, Schedule 1 on the Wildlife and Countryside Act 1981 or are included on the red or amber BoCC lists. These waterbird species and birds of prey are detailed in *Table 24.12*.

Table 24.12 Non-breeding Waterbirds and Birds of Prey Recorded in the Survey Area over the Winters 2011-12 and 2013-14.

Common Name	Scientific Name	Conservation Status
Bewick's Swan	*Cygnus columbianus*	Birds Dir Annex 1; WCA Sched 1; BoCC Amber; UKBAP
Greylag Goose	*Anser anser*	BoCC Amber
Red-breasted Goose	*Branta ruficollis*	Birds Dir Annex 1
Dark-bellied Brent Goose	*Branta bernicla bernicla*	BoCC Amber; UKBAP
Shelduck	*Tadorna tadorna*	BoCC Amber
Gadwall	*Anas strepera*	BoCC Amber
Teal	*Anas crecca*	BoCC Amber
Mallard	*Anas platyrhynchos*	BoCC Amber
Pintail	*Anas acuta*	BoCC Amber
Pochard	*Aythya ferina*	BoCC Amber
Tufted Duck	*Aythya fuligula*	BoCC Amber
Common Scoter	*Melanitta nigra*	WCA Sched 1; BoCC Red; UKBAP
Goldeneye	*Bucephala clangula*	BoCC Amber
Little Egret	*Egretta garzetta*	Birds Dir Annex 1; BoCC Amber
Little Grebe	*Tachybaptus ruficollis*	BoCC Amber
Slavonian Grebe	*Podiceps auritus*	Birds Dir Annex 1; WCA Sched 1
Marsh Harrier	*Circus aeruginosus*	Birds Dir Annex 1; WCA Sched 1; BoCC Amber
Hen Harrier	*Circus cyaneus*	Birds Dir Annex 1;BoCC Red
Peregrine	*Falco peregrinus*	Birds Dir Annex 1; WCA Sched 1
Oystercatcher	*Haematopus ostralegus*	BoCC Amber

Common Name	Scientific Name	Conservation Status
Ringed Plover	*Charadrius hiaticula*	BoCC Amber
Golden Plover	*Pluvialis apricaria*	Birds Dir Annex 1; BoCC Amber
Grey Plover	*Pluvialis squatarola*	BoCC Amber
Lapwing	*Vanellus vanellus*	BoCC Red;UKBAP; LBAP
Knot	*Calidris canutus*	BoCC Amber
Dunlin	*Calidris alpina*	Birds Dir Annex 1; BoCC Red
Snipe	*Gallinago gallinago*	BoCC Amber
Woodcock	*Scolopax rusticola*	BoCC Amber
Black-tailed Godwit	*Limosa limosa*	WCA Sched 1;BoCC Red; UKBAP; LBAP
Bar-tailed Godwit	*Limosa lapponica*	Birds Dir Annex 1; BoCC Amber
Curlew	*Numenius arquata*	BoCC Amber; UKBAP; LBAP
Green Sandpiper	*Tringa ochropus*	WCA Sched 1; BoCC Amber
Spotted Redshank	*Tringa erythropus*	BoCC Amber
Greenshank	*Tringa nebularia*	WCA Sched 1
Redshank	*Tringa totanus*	BoCC Amber
Turnstone	*Arenaria interpres*	BoCC Amber
Black-headed Gull	*Chroicocephalus ridibundus*	BoCC Amber
Common Gull	*Larus canus*	BoCC Amber
Lesser Black-backed Gull	*Larus fuscus*	BoCC Amber
Herring Gull	*Larus argentatus*	BoCC Red; UKBAP; LBAP
Great Black-backed Gull	*Larus marinus*	BoCC Amber
Short-eared Owl	*Asio flammeus*	Birds Dir Annex 1; WCA Sched 1; BoCC Amber
Kingfisher	*Alcedo atthis*	Birds Dir Annex 1;WCA Sched 1;BoCC Amber

72. Two of the key species identified in the non-breeding (wintering) bird surveys are interest features of the Deben Estuary SPA: dark-bellied brent goose and avocet. A summary of their presence in the survey area is given below:

- **Dark-bellied Brent Goose**: Mainly present between December and February. The peak number of dark-bellied brent goose recorded in winter 2011/12 was 2,183 individuals in Sector 9 (under the 1% international wintering threshold of 2,400 individuals, Austin *et al.* 2014) during high tide in February 2012. The peak

number in winter 2013/14 was 1,588 across the Deben Estuary, also during high tide in December 2013. Feeding areas identified during the surveys include areas within the onshore cable route redline boundary close to where the HDD passes under the Deben Estuary, an area of marsh approximately 1km north of the crossing (on the west bank of the Deben) and three areas 1km to 2km south of the crossing point (all on the west bank of the Deben). The maximum recorded number of dark-bellied brent goose on farmland crossed by the onshore cable route was 950 on two survey dates in January 2014.

- **Avocet:** Present in both winters, with the peak in winter 2011/12 being325 individuals in Sector 9 during high tide in February 2012(exceeding national wintering threshold of 75 individuals, Austin *et al*. 214). The peak in winter 2013/14 was 328 across the Deben Estuary during high tide in November 2013. The surveys highlighted primary roost sites within the survey area on both the east and west bank of the Deben approximately 500m north of the crossing. A secondary roost was identified approximately 2km north-west of the Deben crossing. The main feeding zone within the area surveyed for avocets includes a stretch of the Deben extending from the cable crossing point approximately 1.5km to the north.

73. The non-breeding (wintering) bird species identified in the desk based assessment and specific surveys which are screened in for assessment are those listed as features or assemblage components of the Deben Estuary SPA and the Deben Estuary SSSI. This approach was agreed in consultation with Natural England and the RSPB during the Evidence Plan process (*Appendix 13.1*). In addition, during the Evidence Plan process Natural England identified that, when the features of the Deben Estuary SPA are formally reviewed, black-tailed godwit is very likely to be proposed as an additional feature. The peak in winter 2013/14 was 450 individuals across the Deben Estuary in April 2014. Since this species is a feature of the Deben Estuary SSSI it has already been screened in for assessment. The species screened in have been termed the 'Key Non-breeding Bird Species' in this chapter. These species are:

- Mute swan;
- Dark-bellied brent goose;
- Shelduck;
- Wigeon;
- Pintail;

- Avocet;
- Grey plover;
- Dunlin;
- Black-tailed godwit;
- Curlew; and
- Redshank.

74. In addition to the valuation of the Key Non-breeding Bird Species above, the overall assemblage of non-breeding birds within and adjacent to the onshore cable route is considered to be of up to international value.

24.5.4 Summary Assessment of Nature Conservation Value

75. The assessment of the nature conservation value of the ornithological receptors potentially affected by the onshore cable route is summarised in *Table 24.13*. Those other designated sites listed in *Table 24.10*have been screened out from further assessment based on the distance between the onshore electrical transmission works of the proposed project and the designated site boundary and the negligible probability of an effect arising from the proposed project affecting the designated site. Potential effects on the birds that are the interest features of the terrestrial / coastal designated sites whilst those birds are foraging or on passage out to sea are addressed in Chapter 13 Offshore Ornithology.

Table 24.13 Summary of Nature Conservation Value

Receptor	Value Inferred by Legislation	Value in Context of Development Area
Deben Estuary SPA	International	International
Deben Estuary Ramsar Site	International	International
Deben Estuary SSSI	National	National
Breeding Birds	County to International	County
Key Breeding Bird Species	County to International	County
Wintering Birds	County to International	County to National
Key Non-breeding Bird Species	National to International	County to International

24.6 Potential Impacts

76. Potential impacts are assessed below ordered by the construction, operation and decommissioning phases of development. The methodology that is followed is described in *section 24.4.3* above.

77. The assessment of potential impacts set out below is on the basis of the worst case potential impacts set out in *section 24.3.3*and *Table 24.2*and includes separate assessments of the two construction approaches, Single Phase and Two Phased.

24.6.1 Potential Impacts During Construction

78. The potential impacts during construction that are assessed are:

- Habitat loss (temporary); and
- Disturbance / displacement (temporary).

79. The scale of temporary habitat loss is described in the worst case scenario *Table 24.2* above.

80. The assessment of potential impacts set out below includes accounting for the embedded mitigation that is described in *Table 24.3*.

24.6.1.1 Impact 1: Habitat loss (temporary): Potential impacts on statutory designated sites

81. Where it is necessary to site equipment to pull the cables through the ducts there would be temporary habitat loss. Access will be mainly via existing roads and tracks and new haul road would be required only where jointing bays are located in remote areas. The eventual length of temporary haul road required will be dependent on the detailed design and the final location of the jointing bays. However a maximum of 17.8 km of 5.5m width haul road is estimated to be required along the entire route. Temporary track matting may be required if ground conditions are very poor.

82. A jointing bay construction compound would contain hardstanding areas of up to 775m^2. The cable joints would be completed in an excavated jointing bay, which would be backfilled following the cable jointing and the land returned to pre-construction condition.

24.6.1.1.1 Single Phase

83. No temporary habitat loss occurs within a statutory designated site.

84. The statutory designated sites are of high sensitivity and of international or national conservation value. The magnitude of effect is no change as there is no habitat loss within a statutory designated site. It is concluded that the impact through habitat loss (temporary) to statutory designated sites is **no impact**.

24.6.1.1.2 Two Phased

85. As described above, no temporary habitat loss will occur within a statutory designated site and the impact through habitat loss (temporary) to statutory designated sites is **no impact**.

24.6.1.2 Impact 2: Habitat loss (temporary): Potential impacts on Key Breeding Bird Species

86. As discussed above for Impact 1, the requirement for access to the onshore cable route and the construction of jointing bays and associated jointing bay compounds will lead to temporary habitat loss during construction.

24.6.1.2.1 Single Phase

87. **Marsh harrier**: Marsh harriers were recorded within agricultural and wetland habitats at the east end of the onshore cable route. The nest of the species is a platform of vegetation on the ground, often within a reedbed or an arable crop, and by the nature of agricultural processes, a new nest is usually required each year.

88. Up to seven jointing bay compounds will be located close to the Deben Estuary – six east of the River Deben and one to the west. Marsh harrier was confirmed breeding in 2012 in the reeds along the Queen's Fleet, over 100m from the proposed crossing point (see *Confidential Figure 24.3*).

89. A haul road will be required up to the Queens Fleet and there is likely to be a jointing bay on the east bank of the River Deben. Access would be taken along the existing track north of the cable route, utilising an existing bridge. There is potential for habitat loss at the bridge if this needs to be replaced or upgraded to take the weight of vehicles or plant.

90. The area of habitat to be lost temporarily is therefore a very minor proportion of the potential marsh harrier nesting habitat available within the Bawdsey, Alderton and Ramsholt Marshes on the northern side of the Deben Estuary.

91. Marsh harrier is of medium sensitivity to temporary habitat loss and the population within the Development Area is of county conservation value. The magnitude of effect is low as nesting habitat will be lost for no more than two breeding seasons (accounting for reinstatement time) and the area lost is a very minor proportion of the potential marsh harrier nesting habitat available. It is concluded that the impact through habitat loss (temporary) for marsh harrier is **minor adverse**.

92. **Cetti's warbler** is of medium sensitivity to temporary habitat loss and the population within the Development Area is of county conservation value. No temporary habitat loss would occur in the potential nesting habitat for Cetti's warbler (see *Confidential Figures 24.4 and 24.5*). The magnitude of effect is no change as the nesting habitat

will be avoided as locations for equipment used to pull the cables through the ducts and for any new haul roads that prove necessary (accounted for in worst case scenario). It is concluded that the impact through habitat loss (temporary) for Cetti's warbler is **no impact**.

93. Some nesting and foraging habitats used by the **breeding bird assemblage** would be affected by temporary habitat loss associated with construction of the onshore cable route and substation, with notable areas identified in paragraph 67 including agricultural land and hedgerow (see *Appendix 24.1* for further details). The breeding bird assemblage within the Development Area is of county conservation value. The magnitude of effect is low as nesting habitat will be lost for no more than two breeding seasons (accounting for reinstatement time) and works associated with East Anglia THREE would only temporarily affect a small proportion of the habitat available for birds in any given place. It is concluded that the impact through habitat loss (temporary) for the breeding bird assemblage is at worst **minor adverse**.

24.6.1.2.2 Two Phased

94. The area of temporary habitat loss will be the same as under the single phase programme, but the duration of loss before habitat is fully reinstated will be extended by a further breeding season.

95. **Marsh harrier**: Up to seven joint bay compounds will be located within the Deben Estuary – six east of the River Deben and one to the west. The potential loss of a small area of reedbed or agricultural land, as described above is a very minor proportion of the potential marsh harrier nesting habitat available within the Bawdsey, Alderton and Ramsholt Marshes. Although this loss would be over three breeding seasons (including reinstatement), the magnitude of effect remains low. It is concluded that the impact through habitat loss (temporary) for marsh harrier is **minor adverse**.

96. **Cetti's warbler**: There is no potential to temporarily lose those areas of Cetti's warbler nesting habitat along the onshore cable route. It is concluded that the impact through habitat loss (temporary) for Cetti's warbler is **no impact**.

97. **Breeding bird assemblage:** Although the loss of habitat would be over three breeding seasons (including reinstatement), the magnitude of effect remains low as a small proportion of land available would be affected. It is concluded that the impact through habitat loss (temporary) for the breeding bird assemblage is **minor adverse**.

24.6.1.3 Impact 3: Habitat loss (temporary): Potential impacts on Key Non-breeding Bird Species

98. As discussed above for Impact 1, the requirement for access to the onshore cable route and the construction of jointing bays and associated jointing bay compounds will lead to temporary habitat loss during construction. To provide further assurance that brent goose will not be disturbed by construction activities, it was agreed with NE that no intrusive construction activities between the Queens Fleet and the jointing bay compound on the east bank of the Deben Estuary crossing will take place from 1st November to the end of February. This means that temporary habitat loss associated with construction activity will occur during the breeding season, and any effects on habitat associated with temporary construction activities will be limited to the period before habitat reinstatement is complete (taken to be the following non-breeding season).

24.6.1.3.1 Single phase

99. **Brent goose**: There is the potential for some low-lying farmland of feeding value to brent goose to be temporarily affected (dependent on cropping practices in any particular year) along the onshore cable route where it crosses the Bawdsey, Alderton and Ramsholt Marshes.

100. Up to seven jointing bay compounds will be located in the Deben Estuary. A haul road will be required up to the Queens Fleet and there is likely to be a jointing bay on the east bank of the River Deben. Access would be taken along the existing track north of the cable route, utilising an existing bridge. There is potential for temporary habitat loss at the bridge if this needs to be replaced or upgraded to take the weight of vehicles or plant.

101. The area of low lying farmland which would be temporarily affected is therefore a very minor proportion of the potential brent goose feeding habitat available on both sides of the Deben Estuary.

102. Brent goose is of medium sensitivity to temporary habitat loss and the population within the Development Area is of international conservation value. The magnitude of effect is negligible as the feeding habitat will be sub-optimal for no more than one winter (prior to reinstatement of vegetation) and the area affected is a very minor proportion of the potential brent goose feeding habitat available. It is concluded that the impact through habitat loss (temporary) for brent goose is **minor adverse**.

103. **Other key wildfowl and waders**: There is no potential to temporarily affect areas of intertidal feeding habitat for the other key wildfowl and waders along the onshore cable route because those areas will be not be used to site the cable pull equipment

or haul roads. There is the potential to temporarily affect some low-lying farmland of feeding or roosting value (dependent on cropping practices in any particular year) along the onshore cable route, and at jointing bay compound locations, but this level of loss is unlikely to prevent birds from using the area in similar numbers as present.

104. The other key wildfowl and waders are of medium sensitivity to temporary habitat loss and the population within the Development Area is of international conservation value. The magnitude of effect is low as the main feeding habitat on intertidal land will be avoided, and the loss to possible inland feeding or roosting areas will be minimal. It is concluded that the impact through habitat loss (temporary) for the other key wildfowl and waders is **minor adverse**.

24.6.1.3.2 Two Phased

105. **Brent goose**: In the Two Phased construction the amount of land temporarily affected for feeding brent goose is the same as that under the single phase programme, however on the assumption of the worst case scenario, this habitat is sub-optimal for two consecutive winters at least in part, because of delay in reinstatement. Despite this increased temporal magnitude of impact, the area of low lying farmland temporarily affected is a small proportion of the potential brent goose feeding habitat available on both sides of the Deben Estuary.

106. Brent goose is of medium sensitivity to temporary habitat loss and the population within the Development Area is of international conservation value. The magnitude of effect is negligible as the feeding habitat will be lost for no more than two winters and that area affected for feeding purposes is a very minor proportion of the potential brent goose feeding habitat available. It is concluded that the impact through habitat loss (temporary) for brent goose is **minor adverse**.

107. **Other key wildfowl and waders**: There is no potential to temporarily lose those areas of feeding habitat for the other key wildfowl and waders along the onshore cable route because those areas (intertidal land) will be not be used to site the cable pull equipment or haul roads.

108. The other key wildfowl and waders are of medium sensitivity to temporary habitat loss and the population within the Development Area is of international conservation value. The magnitude of effect is low as the main feeding habitat on intertidal land will be avoided, and the loss to possible inland feeding or roosting areas will be minimal. It is concluded that the impact through habitat loss (temporary) for the other key wildfowl and waders is **minor adverse**.

24.6.1.4 Impact 4: Disturbance / displacement (temporary): Potential impacts on statutory designated sites

109. Disturbance / displacement (e.g. resulting from noise, lighting or sight of people) is a potential impact that may operate on individuals that are qualifying species of an SPA, either within or outside of the designated site boundary. Accordingly the assessment of potential impacts is carried out on the interest features of the statutory designated sites (in this case the Key Non-breeding Bird Species). That assessment is presented in the paragraphs below.

24.6.1.5 Impact 5: Disturbance and displacement (temporary): Potential impacts on Key Breeding Bird Species

110. Installing the onshore cables in pre-installed ducts will lead to temporary disturbance and displacement where it is necessary to site equipment to pull the cables through the ducts and where any new haul roads prove necessary (accounted for in worst case scenario). Some of those sites may be close to breeding habitats of the Key Breeding Species.

111. A single jointing bay compound would be constructed at each of the 62 jointing bay locations. This process would be repeated during the Two Phased approach.

112. It is anticipated that the equipment required to construct a jointing bay would include a generator with lighting; a de-watering pump; an excavator, loader, tractor and trailer, as well as temporary security fencing around the site to prevent unauthorised access.

113. Temporary lighting may be required within construction areas dependent on the season and activities being undertaken. Twenty four hour lighting is also likely to be required at the CCS sites.

114. The estimated duration of the works is three to four weeks per jointing bay with simultaneous operations along the route. It is expected that jointing operations would take approximately 10 days spread over a four to six working week period, with approximately five workers for each jointing bay.

115. The numbers of personnel on any one section at any one time will vary dependent upon the works being undertaken. Under a Single Phase approach the total number of construction employees required at peak periods of activity in any one section of the onshore cable installation has been estimated at up to 50, and with a Two Phased approach this would be 30.

116. All construction works will follow the good practice to avoid disturbance to breeding Schedule 1 birds (the Key Breeding Bird Species) established by the East Anglia

THREE OLEMS. This is an element of the embedded mitigation and is taken into account when assessing potential impacts.

24.6.1.5.1 Single Phase

117. **Marsh harrier**: There is the potential to temporarily disturb marsh harrier within the Queen's Fleet area on Bawdsey Marshes where breeding was confirmed in 2012. This potential for disturbance will be managed and reduced by the application of the management and mitigation measures in the OLEMS. Associated measures are likely to involve:

- Pre-construction surveys with the aim of identifying and confirming areas where nesting is regular and mitigation by habitat management might be necessary.
- If baseline and pre-construction data identifies regular marsh harrier nesting within the vicinity of works associated with the proposed East Anglia THREE project (that is, within the Order Limits) then targeted habitat management will be employed. This will involve making all suitable nesting vegetation around jointing bays and new haul roads (subject to that still being within the Order Limits) unsuitable for nesting by strimming the vegetation to ground level outside the nesting period (taken to be March to August inclusive). Any regrowth during the following spring and summer, and before construction starts, will be kept to below the height that it will be attractive to nesting birds by regular strimming. If the nesting location and section of cable route is within 200m of a known location for a concentration of feeding brent goose then vegetation clearance will only be undertaken during September to November inclusive (to minimise disturbance to goose when they are more dependent on feeding on agricultural land).
- During construction, if an active nest is identified, and there is the potential for disturbance, then works in the area would halt temporarily until a mitigation plan is agreed with NE. Mitigation would likely constitute an exclusion area for specified activities around a marsh harrier nest of between 100m and 400m radius, with that radius dependent on the stage of nesting activity that the pair has reached (nest building, eggs or chicks), and type of construction activity. Activities that only involve the movement of vehicles past the nest location are able to continue where that is occurring beyond a distance of 100m, whereas activities that involve people outside of vehicles and construction activities such as excavations are able to continue where that is occurring beyond a distance of 400m. Limitations would exist until it can be demonstrated by regular monitoring that breeding is complete.

- On completion of construction, the land would be reinstated (farmland returned to agricultural practice and other areas would be reinstated) in accordance with provisions in the OLEMS.

118. Marsh harrier is of high sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for marsh harrier is **minor adverse**.

119. **Cetti's warbler**: There is the potential to temporarily disturb part of the areas of marshy scrub which were identified as potential or actual Cetti's warbler breeding habitat in 2012. This potential for disturbance will be managed and reduced by the application of the management and mitigation measures in the OLEMS. Associated measures are likely to involve:

- Pre-construction surveys with the aim of identifying and confirming areas where nesting is regular and mitigation by habitat management might be necessary.
- If baseline and pre-construction data identifies regular nesting within the vicinity of works associated with the proposed East Anglia THREE project (that is, within the Order Limits) then targeted habitat management will be employed. This will make all suitable nesting vegetation within 10m of where surface ground works are to take place (around jointing bays and new haul roads, subject to that still being within the DCO 'red line' boundary) unsuitable for nesting Cetti's warbler by strimming the vegetation to ground level outside the bird nesting period (March to August inclusive). Any regrowth during the following spring and summer, and before construction starts, will be kept to below the height that it will be attractive to nesting birds by regular strimming. Under present information (noting that pre-construction surveys will be carried out) this measure will not be required as all previously observed Cetti's Warbler nesting locations are associated with HDD locations associated with East Anglia ONE construction activities.
- During construction, fortnightly surveys by a suitably experienced ornithologist from the beginning of April to the end of July will establish if breeding is taking place. If an active nest is identified in the vicinity of the works and there is the potential for disturbance, then works in the area would halt temporarily until an exclusion area for specified activities around the nest of 25m radius is enforced.
- In the event that a 25m exclusion zone cannot be established due to the location of existing construction activities then consultation will take place with Natural

England and additional measures will be explored. In the event that additional measures cannot be developed the final backstop is that specific activities will cease in order that the criminal offence is not committed of disturbing a Schedule 1 breeding species.

- On completion of construction, the land would be reinstated, farmland returned to agricultural practice and other areas would be reinstated in accordance with provisions in the OLEMS.

120. Cetti's warbler is of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for Cetti's warbler is **negligible**.

121. **Breeding bird assemblage:** All nesting birds receive general protection under the W&C Act and pre-construction surveys will aim to identify the location of nest sites that may be affected by construction activities so that measures can be implemented to avoid destruction of nests, eggs or young. The majority of breeding species recorded during baseline surveys were small passerines, which are generally relatively tolerant of human activities, particularly in agricultural areas with working farms. Although there may be some limited displacement, it is concluded that the impact through disturbance and displacement (temporary) for breeding birds is **negligible**.

24.6.1.5.2 Two Phased

122. **Marsh harrier**: The potential for disturbance in both phases would be managed and reduced by the application of the management and mitigation measures in the OLEMS described above.

123. Marsh harrier is of high sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. Despite the potential for works to take place during more than one breeding season, no increase in magnitude of effect is predicted. The magnitude of effect is therefore negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for marsh harrier is **minor adverse**.

124. **Cetti's warbler**: The potential for disturbance would in both phases be managed and reduced by the application of the management and mitigation measures in the OLEMS described above.

125. Despite the potential for works to take place during more than one breeding season, no increase in impact magnitude is predicted. Cetti's warbler is of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for Cetti's warbler is **negligible**.

126. **Breeding bird assemblage:** Despite the potential for works to take place during more than one breeding season, no increase in impact magnitude is predicted. The breeding bird assemblage is likely to generally be of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. It is concluded that the impact through disturbance and displacement (temporary) for breeding birds is **negligible**.

24.6.1.6 Impact 6: Disturbance and displacement (temporary): Potential impacts on Key Non-breeding Bird Species

127. A single jointing bay would be constructed at each of the 62 jointing bay locations. This process would be repeated during the Two Phased approach.

128. Temporary lighting may be required within construction areas dependent on the season and activities being undertaken. Twenty four hour lighting is also likely to be required at the CCS sites.

129. It is anticipated that the equipment required to construct a jointing bay would include a generator with lighting; a de-watering pump; an excavator, loader, tractor and trailer, as well as temporary security fencing around the site to prevent unauthorised access.

130. The estimated duration of the works is three to four weeks per jointing bay with simultaneous operations along the route. It is expected that jointing operations would take approximately 10 days spread over a four to six working week period, with approximately five workers for each jointing bay.

131. The numbers of personnel on any one section at any one time will vary dependent upon the works being undertaken. Under a Single Phase approach the total number of construction employees required at peak periods of activity in any one section of the onshore cable installation has been estimated at up to 50, and with a Two Phased approach this would be 30.

132. All construction works will follow good practice to avoid disturbance to non-breeding SPA and SSSI interest features and assemblage components of the Deben Estuary

(the Key Non-breeding Bird Species) established by the OLEMS. This is an element of the embedded mitigation and is taken in to account when assessing potential impacts.

24.6.1.6.1 Single Phase

133. Pulling onshore cables through pre-installed ducts will lead to temporary disturbance and displacement where it is necessary to site equipment to pull the cables through the ducts and where any new haul roads prove necessary (accounted for in worst case scenario). The feeding locations of brent goose and the other key non-breeding wildfowl and waders differ. As these species differ they are assessed separately.

134. **Brent goose**: There is the potential to disturb temporarily a small proportion of the low-lying farmland where brent goose is found (see Figure 24.6 and Figure 24.7 for distributions). This potential for disturbance will be managed and reduced by the application of the management and mitigation measures in the OLEMS.

135. During periods of construction works, from the 1st November to 28/29th February the only activities to be undertaken at the east side of the Deben Estuary (i.e. between Ferry Road and the Deben Estuary) would be:

- Walk-over site investigation or survey works; or
- Any inspections required to assess the integrity, safety and security of [EATL] assets; or
- Any response required for the purposes of ensuring the health, safety and security of employees, contractors and the general public, unless otherwise agreed with Natural England.

136. Access by vehicle would be from either Access B or Access C (but not from both simultaneously to ensure that any disturbance is localised).

137. During times of severe weather (prolonged cold conditions) within this period, access will only be taken for the purposes of health, safety and security unless otherwise agreed with Natural England. The definition of 'severe weather' will be the same as that used to implement the Statutory Suspension of Wildfowl Shooting in Severe Winter Weather measure under the Wildlife and Countryside Act. The severe weather condition will come into force at 00h01 following the day when the relevant Secretary of State signs the necessary Statutory Instrument to bring the requirement into force. The suspension will end after a maximum period of 14 days unless otherwise extended by the Secretary of State through the signing of a further Statutory Instrument. After the end of the shooting season and up until the end of February, the same weather criteria shall apply, albeit without a signed order from

the Secretary of State: EATL shall be responsible for monitoring local temperatures for this purpose.

138. Brent goose is of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for brent goose is **minor adverse**.

139. **Other key wildfowl and waders**: There is the potential to disturb temporarily a small proportion of the low-lying farmland where the other key wildfowl and waders feed. This potential for disturbance will be managed and reduced by the application of the management and mitigation measures in the OLEMS. The ECoW will monitor the distribution of feeding birds, and in particular, Schedule 1 listed avocet in the intertidal areas around the crossing points.

140. The other key wildfowl and waders are of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for the other key wildfowl and waders is **minor adverse**.

24.6.1.6.2 Two Phased

141. **Brent goose**: The potential for disturbance in both phases would be managed and reduced by the application of the management and mitigation measures in the OLEMS described above. The requirement, and success of the mitigation over the first phase would be used to inform management during the second phase, if this were to occur during a subsequent winter period. If any evidence of disturbance were observed during Phase 1, amendments to the OLEMS after discussions with Natural England would ensure that no repeat would occur in Phase 2.

142. Despite the potential for works to take place during more than one non-breeding season, no increase in impact magnitude is predicted.

143. Brent goose is of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for brent goose is **minor adverse**.

144. **Other key wildfowl and waders**: The potential for disturbance in both phases would be managed and reduced by the application of the management and mitigation measures in the OLEMS described above. The requirement, and success of the mitigation over the first phase would be used to inform management during the second phase, if this were to occur during a subsequent breeding season. If any evidence of disturbance were observed during Phase 1, amendments to the OLEMS after discussions with Natural England would ensure that no repeat would occur in Phase 2.

145. Despite the potential for works to take place during more than one breeding season, no increase in impact magnitude is predicted.

146. The other key wildfowl and waders are of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for the other key wildfowl and waders is **minor adverse**.

24.6.2 Potential Impacts During Operation

147. The potential impacts during operation that are assessed are:

- Habitat loss (permanent); and
- Disturbance and displacement (temporary).

148. The scale of permanent habitat loss is described in the worst case scenario *Table 24.2* above.

149. The assessment of potential impacts set out below includes accounting for the embedded mitigation that is described in *Table 24.3* above.

24.6.2.1 Impact 1: Habitat loss (permanent): Potential impacts on statutory designated sites

150. The permanent habitat loss that operates throughout the duration of the proposed project results from the footprint of the substation (the negligible extent of cable joint kiosks which are 1m by 0.75m by 1m high has been excluded). None of that permanent habitat loss occurs within a statutory designated site.

151. The statutory designated sites are of high sensitivity and of international or national conservation value. The magnitude of effect is no change as there is no habitat loss within a statutory designated site. It is concluded that there is **no impact** through habitat loss (permanent) to statutory designated sites.

24.6.2.2 Impact 2: Habitat loss (permanent): Potential impacts on Key Breeding Bird Species

152. The permanent habitat loss that operates throughout the duration of the proposed project results from the footprint of the substation (the negligible extent of cable joint kiosks which are 1m by 0.75m by 1m high has been excluded). None of that permanent habitat loss occurs to the breeding habitat of the Key Breeding Bird Species.

153. The Key Breeding Bird Species (**marsh harrier and Cetti's warbler**) are of medium sensitivity and the population within the Development Area of county conservation value. The magnitude of effect is no change as there is no breeding habitat loss for the Key Breeding Bird Species. It is concluded that there is **no impact** through habitat loss (permanent) to the Key Breeding Bird Species.

154. For the general **breeding bird assemblage**, permanent habitat loss will be restricted to the 3.04ha footprint of the new substation for East Anglia THREE, located within an area of agricultural land adjacent to the existing substation at Bramford. This is likely to result in the loss of some nesting or foraging habitat for farmland birds such as yellowhammer and skylark. This loss would however only affect a very small proportion of the habitat available at a county level and there is sufficient area nearby unaffected by the scheme in which birds can still use.

155. Within the OLEMS there are prescribed measures to minimise the effects of habitat loss, including a planned Arboricultural Method Statement which would detail the tree and hedge protection required at the substation. A specific Landscape Management Scheme would also be developed for the East Anglia THREE substation, which would include landscape planting and earth mounding. In addition, a detailed scheme of hedge planting aftercare will be provided, to be agreed with Suffolk Coastal District Council, Mid Suffolk District Council and Suffolk County Council.

156. It is concluded that the impact through habitat loss (permanent) for the breeding bird assemblage is **negligible**.

24.6.2.3 Impact 3: Habitat loss (permanent): Potential impacts on Key Non-breeding Bird Species

157. The permanent habitat loss that operates throughout the duration of the proposed project results from the footprint of the substation (the negligible extent of cable joint kiosks which are 1m by 0.75m by 1m high has been excluded). The feeding habitat requirements of the Key Non-breeding Bird Species differ between brent goose and the other wildfowl and waders. Brent goose feeds in both the intertidal area of the Deben Estuary and on the crops and their residues on the adjacent low-lying farmland. The other wildfowl and waders feed on the intertidal area of the

Deben Estuary. However, none of the permanent habitat loss associated with the substation occurs within the habitat of the Key Non-breeding Bird Species.

158. The Key Non-breeding Bird Species are of medium sensitivity to permanent habitat loss and the populations within the Development Area are of international conservation value. The magnitude of effect is no change as the feeding and roosting habitat will be avoided. It is concluded that there would be **no impact** through habitat loss (permanent) for Key Non-breeding Bird Species.

24.6.2.4 Impact 4: Disturbance and displacement (temporary): Potential impacts on statutory designated sites

159. Disturbance / displacement is a potential impact that may operate on individuals that are qualifying species of an SPA, either within or outside of the designated site boundary. Accordingly the assessment of potential impacts is carried out on the interest features of the statutory designated sites (in this case the Key Non-breeding Bird Species). That assessment is presented in the paragraphs below.

24.6.2.5 Impact 5: Disturbance and displacement (temporary): Potential impacts on Key Breeding Bird Species

160. During the operational phase of the proposed project one visit per joint bay per year is planned, and there is also the potential for localised, small scale non-scheduled maintenance works to take place, such as the replacement of a failed cable section, and this would result in the potential for small scale, temporary disturbance and displacement effects. These effects are similar to those of the construction phase due to their localised nature and the short period over which works would be conducted. Any such cable replacement works would have to follow good practice to avoid disturbance to Key Breeding Bird Species established by the OLEMS.

161. The maintenance operation of replacing a failed cable will lead to temporary disturbance and displacement where it is necessary to operate equipment. Some of those sites will potentially be close to breeding habitats of the Key Breeding Species. The nesting locations of marsh harrier and Cetti's warbler differ as do their sensitivities to disturbance and displacement. As these species differ they are assessed separately.

162. **Marsh harrier**: There is the potential to disturb temporarily part of the Queen's Fleet on Bawdsey Marshes where marsh harrier was confirmed breeding in 2012 should a cable need to be replaced along that length. The potential to disturb this area will be managed and reduced to below the level where any nesting marsh harrier would be disturbed by the application of the management and mitigation measures in the OLEMS.

163. During any required inspections and/or routine maintenance work, best practice procedures would be followed and be in accordance with the relevant standards at that time. If intrusive works were required at any point, an ecologist would be contacted to assess whether there are any impacts associated with the work, before that work can proceed.

164. Marsh harrier is of high sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for marsh harrier is **minor adverse**.

165. **Cetti's warbler**: There is the potential to disturb temporarily part of the areas of marshy scrub which were identified as potential or actual Cetti's warbler breeding habitat in 2012 should a cable need to be replaced along any of those lengths. The potential to disturb such an area will be managed and reduced to below the level where any nesting Cetti's warbler would be disturbed by the application of the management and mitigation measures in the OLEMS.

166. During any required inspections and/or routine maintenance work, best practice procedures would be followed and be in accordance with the relevant standards at that time. If intrusive works were required at any point, an ecologist would be contacted to assess whether there are any impacts associated with the work, before that work can proceed.

167. Cetti's warbler is of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for Cetti's warbler is **negligible**.

168. **Breeding bird assemblage:** The range of farmland species located within the vicinity of the onshore cable route is likely to be of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for breeding birds is **negligible**.

24.6.2.6 Impact 6: Disturbance and displacement (temporary): Potential impacts on Key Non-breeding Bird Species

169. During the operational phase of the project there is the potential for localised, small scale maintenance works to take place, such as the replacement of a failed cable section, and this would result in the potential for small scale, temporary disturbance and displacement effects. These effects are similar to those of the construction phase due to their localised nature and the short period over which works could be conducted. Any such cable replacement works would follow good practice to avoid disturbance to the Key Non-breeding Bird Species established by the OLEMS.

170. The maintenance operation of replacing a failed cable will lead to temporary disturbance and displacement where it is necessary to operate equipment. The feeding locations of brent goose and the other key non-breeding wildfowl and waders differ. As these species differ they are assessed separately.

171. **Brent goose**: There is the potential to disturb temporarily a small proportion of the low-lying farmland where brent goose feeds. The potential to disturb these areas will be managed and reduced to below the level where any significant number of feeding brent goose would be disturbed by the application of the management and mitigation measures in the OLEMS.

172. During any required inspections and/or routine maintenance work, best practice procedures would be followed and be in accordance with the relevant standards at that time. If intrusive works were required at any point, an ecologist would be contacted to assess whether there are any impacts associated with the work, before that work can proceed.

173. Brent goose is of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of International conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for brent goose is **minor adverse**.

174. **Other key wildfowl and waders**: There is the potential to disturb temporarily a small proportion of the intertidal land where the other key wildfowl and waders feed. The potential to disturb these areas will be managed and reduced to below the level where any significant number of feeding other key wildfowl and waders would be disturbed by the application of the management and mitigation measures in the OLEMS.

175. During any required inspections and/or routine maintenance work, best practice procedures would be followed and be in accordance with the relevant standards at

that time. If intrusive works were required at any point, an ecologist would be contacted to assess whether there are any impacts associated with the work, before that work can proceed.

176. The other key wildfowl and waders are of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of International conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the Outline Landscape and Ecological Management Strategy. It is concluded that the impact through disturbance and displacement (temporary) for the other key wildfowl and waders is **minor adverse**.

24.6.2.7 Impact 7: Disturbance and displacement (permanent): Potential impacts on statutory designated sites

177. The potential permanent disturbance/displacement that may occur throughout the duration of the proposed project would result from the lighting and noise associated with the substation, which would be located adjacent to and north of the existing National Grid Bramford Substation, and east of the East Anglia ONE converter station. This is not located within a statutory designated site.

178. Statutory designated sites are of high sensitivity and of international or national conservation value however due to the distance from the substation there would be no habitat loss to statutory sites and the magnitude of effect would be no change. It is concluded that there would be **no impact** through habitat loss (permanent) to statutory designated sites as there is no pathway for impact.

24.6.2.8 Impact 8: Disturbance and displacement (permanent): Potential impacts on Key Breeding Bird Species

179. During the operational phase of the proposed project, permanent disturbance/displacement is restricted to lighting and noise associated with the planned substation located at Bramford.

180. At the substation operational noise limits impacts are discussed within the Chapter 26 Noise and Vibration; operational noise emissions would be no greater than 5dB above the background noise level ($L_{A90,1hr}$) during the daytime and 35dB $L_{Aeq,\ 15\ min}$ during the night at identified receptors.

181. Mitigation for lighting would aim to reduce light spill onto adjacent habitats through the use of directional lighting and cowls where required.

182. The nesting locations of marsh harrier and Cetti's warbler differ as do their sensitivities to disturbance and displacement. As these species differ they are assessed separately.

183. **Marsh harrier**: the substation is not close to any suitable nesting habitat for marsh harrier (see Appendix 24.12 - Confidential Appendix 4).

184. Marsh harrier is of high sensitivity to permanent disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is no change following the application of the management measures described above. It is concluded that there is **no impact** through disturbance and displacement (permanent) for marsh harrier.

185. **Cetti's warbler**: the substation is not close to any suitable nesting habitat for Cetti's warbler (see Appendix 24.12 - Breeding Bird Survey Report).

186. Cetti's warbler is of low sensitivity to permanent disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is no change. It is concluded that there is **no impact** through disturbance and displacement (permanent) for Cetti's warbler.

187. **Breeding bird assemblage:** Although the substation may be close to some breeding territories and foraging areas for farmland passerines, these species are likely to be of relatively low sensitivity to permanent disturbance and displacement. The magnitude of effect is negligible. It is concluded that there would be a **negligible** impact through disturbance and displacement (permanent) for the breeding bird assemblage.

24.6.2.9 Impact 9: Disturbance and displacement (permanent): Potential impacts on Key Non-breeding Bird Species

188. **Brent goose:** the substation is not close to any suitable feeding habitat for brent goose (see *Appendix 24.2*), and so no individuals will be affected.

189. Brent goose is of medium sensitivity to permanent disturbance and displacement and the population within the Study Area is of international conservation value. The magnitude of effect is no change. It is concluded that there is **no impact** through disturbance and displacement (permanent) for brent goose.

190. **Other key wildfowl and waders**: the substation is not close to any suitable feeding habitat for wildfowl and wader species (see Appendix 24.2), and so no individuals will be affected.

191. The other key wildfowl and waders are of medium sensitivity to permanent disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is no change. It is concluded that there is **no impact** through disturbance and displacement (permanent) for the other key wildfowl and waders.

24.6.3 Potential Impacts During Decommissioning

192. The potential impacts during decommissioning that are assessed are:

- Disturbance and displacement (temporary).

193. As part of the decommissioning operation the jointing bays and ducts will be left in situ and the cables will be de-energised. The kiosks and the substation would be removed. It is judged that the potential effects of decommissioning are similar to those identified for construction although of much lower magnitude of effect. This means that potential effects will be localised and occur over a short period.

194. Any such decommissioning works would have to follow the good practice to avoid disturbance to Key Breeding Bird Species and Key Non-breeding Bird Species established by the OLEMS.

24.6.3.1 Impact 10: Disturbance and displacement (temporary): Potential impacts on statutory designated sites

195. Disturbance / displacement is a potential impact that may operate on individuals that are qualifying species of an SPA, either within or outside of the designated site boundary. Accordingly the assessment of potential impacts is carried out on the interest features of the statutory designated sites (in this case the Key Non-breeding Bird Species). That assessment is presented in the paragraphs below.

24.6.3.2 Impact 11: Disturbance and displacement (temporary): Potential impacts on Key Breeding Bird Species

196. The decommissioning operation will lead to temporary disturbance and displacement where it is necessary to operate equipment. Some of those sites will potentially be close to breeding habitats of the Key Breeding Species, and also other species within the general breeding bird assemblage. The nesting locations of marsh harrier and Cetti's warbler differ as do their sensitivities to disturbance and displacement. As these species differ they are assessed separately.

197. **Marsh harrier**: There is the potential to disturb temporarily part of the Queen's Fleet on Bawdsey Marshes where marsh harrier was confirmed breeding in 2012 should decommissioning occur in the breeding season. The potential to disturb this area will be managed and reduced to below the level where any nesting marsh harrier

would be disturbed by the application of the management and mitigation measures in the OLEMS, similar to those during construction, described in section 24.6.2.5 above.

198. Marsh harrier is of high sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for marsh harrier is **minor adverse**.

199. **Cetti's warbler**: There is the potential to disturb temporarily part of the areas of marshy scrub which were identified as potential or actual Cetti's warbler breeding habitat in 2012 should decommissioning take place in the breeding season. The potential to disturb such an area will be managed and reduced to below the level where any nesting Cetti's warbler would be disturbed by the application of the management and mitigation measures in the OLEMS, similar to those during construction, described in section 24.6.2.5 above.

200. Cetti's warbler is of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for Cetti's warbler is **negligible**.

201. **Breeding bird assemblage:** There is the potential to temporarily disturb nesting and foraging habitats adjacent to areas of decommissioning activity. The potential to disturb such areas will be managed and reduced by the application of the management and mitigation measures in the OLEMS, similar to those during construction, described in section 24.6.2.5 above.

202. The breeding bird assemblage as a whole is likely to be of low sensitivity to temporary disturbance and displacement and the population within the Development Area is of county conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for breeding birds is **negligible**.

24.6.3.3 Impact 12: Disturbance and displacement (temporary): Potential impacts on Key Non-breeding Bird Species

203. The decommissioning operation will lead to temporary disturbance and displacement where it is necessary to operate equipment. The feeding locations of

brent goose and the other key non-breeding wildfowl and waders differ. As these species differ they are assessed separately.

204. **Brent goose**: There is the potential to disturb temporarily a small proportion of the low-lying farmland where brent goose feeds should decommissioning take place in the winter. The potential to disturb these areas will be managed and reduced to below the level where any significant number of feeding brent goose would be disturbed by the application of the management and mitigation measures in the OLEMS similar to those during construction, described in section 24.6.2.6 above.

205. Brent goose is of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for brent goose is **minor adverse**.

206. **Other key wildfowl and waders**: There is the potential to disturb temporarily a small proportion of the intertidal land where the other key wildfowl and waders feed should decommissioning take place in the winter. The potential to disturb these areas will be managed and reduced to below the level where any significant number of feeding other key wildfowl and waders would be disturbed by the application of the management and mitigation measures in the OLEMS similar to those during construction, described in section 24.6.2.6 above.

207. The other key wildfowl and waders are of medium sensitivity to temporary disturbance and displacement and the population within the Development Area is of international conservation value. The magnitude of effect is negligible following the application of the management and mitigation measures in the OLEMS. It is concluded that the impact through disturbance and displacement (temporary) for the other key wildfowl and waders is **minor adverse**.

24.7 Cumulative Impacts

24.7.1 Identification of Potential Cumulative Impacts

208. The potential impacts arising from the proposed project alone that have been identified above are presented in *Table 24.14* below, within which they are assessed for their potential to create a cumulative impact.

Table 24.14 Potential Cumulative Impacts Arising from the Proposed Project

Impact	Potential for significant cumulative impact	Comment
Construction: Habitat loss (temporary)	Yes	The likelihood that there would be a cumulative impact is low because the contribution from the project is very small.
Construction: Disturbance and displacement (temporary)	Yes	The likelihood that there would be a cumulative impact is medium because although the contribution from the project is small, consecutive disturbance / displacement over a number of years, in association with other plans or projects is possible.
Operation: Habitat loss (permanent)	No	There is no likelihood that there would be a cumulative impact because the contribution from the project is so small as to make a negligible contribution to cumulative effects
Operation: Disturbance and displacement (temporary)	No	There is no likelihood that there would be a cumulative impact because the contribution from the project is so small as to make a negligible contribution to cumulative effects
Decommissioning: Disturbance / displacement (temporary)	No	There is no likelihood that there would be a cumulative impact because the contribution from the project is so small as to make a negligible contribution to cumulative effects

24.7.2 Identification of Projects that Could Act Cumulatively

209. *Table 24.15* lists the projects that have been identified for screening for potential cumulative effects with the proposed East Anglia THREE project and provides the rationale by which each of these projects was screened in or screened out for further consideration.

210. Following this screening process, the projects that have been screened in for further consideration are:

- East Anglia ONE;
- A future East Anglia Offshore Wind (EAOW) Project; and
- Adastral Park science campus.

211. The assessment of cumulative impacts is described for each of these below.

Table 24.15. Summary of Projects considered for the CIA in Relation to the Onshore Ornithology Receptors

Project	Status	Construction / Operation period	Distance from East Anglia THREE(km)	Project definition	Project data status	Included in CIA	Rationale
East Anglia ONE	Planning permission granted	2017- 2018	0	Offshore Windfarm Project Project description available	Complete/high	Yes	Construction would not overlap and consecutive disturbance is unlikely. Operational and decommissioning impacts considered
A future EAOW project	Pre-Application	Unknown	0	Offshore Windfarm Project	Incomplete/low	Yes	Construction would not overlap and consecutive disturbance is unlikely. Operational and decommissioning impacts considered
Sizewell C	Pre-Application	Unknown	24.7	Nuclear Power Station No project detail available	Low	No	No overlap with landfall, onshore cable route or substation location, too distant to impact same receptors
Bramford-Twinstead Transmission Connection	Pre-Application	Early 2020s	0	Electrical connection Now on hold Outline only	Incomplete/low	No	Construction would not overlap, may affect land around the substation location but not the bird species screened in for assessment for the proposed East Anglia THREE project.
SITA (EfW plant)	Operation	Present – late 2014	0.5	Energy From Waste Plant Project description available	Complete/high	No	Would be operational before construction commences. No overlap with landfall, onshore cable route or substation location.

Project	Status	Construction / Operation period	Distance from East Anglia THREE(km)	Project definition	Project data status	Included in CIA	Rationale
SnOasis	Planning permission granted	Unknown	0.7	Winter sport centre. Master plans available	Incomplete/low	No	Brownfield site. No overlap with landfall, onshore cable route or substation location.
Old Fisons site (land west of Paper Mill Lane)	Planning Application TBD	Unknown	0.7	Business park and housing scheme. Master plans available	Complete/high	No	Brownfield site. No overlap with landfall, onshore cable route or substation location.
Adastral park	Planning permission granted	Unknown	0.8	Business park and housing scheme. Master plans available	Complete/high	Yes	Mostly brownfield site. No overlap with landfall, onshore cable route or substation location. Source of recreational disturbance to Deben Estuary and surrounding farmland.
Ipswich Garden Suburb	Identified in adopted Core Strategy	Primarily after 2020	3	Urban development north of Ipswich. Master Plan at consultation phase.	Incomplete / medium	No	Greenfield site. No overlap with landfall, onshore cable route or substation location. Due to distance recreational pressure will focus on Orwell Estuary and not Deben Estuary.

Project	Status	Construction / Operation period	Distance from East Anglia THREE(km)	Project definition	Project data status	Included in CIA	Rationale
Progress Power, Eye, Suffolk	Planning permission granted	Construction 2017-18, operation by 2019.	28	Gas fired power station development	Complete/ high	No	No overlap with landfall, onshore cable route or converter station location. Likely to be constructed prior to the proposed East Anglia THREE project commencement.
Land North Of Woods Lane, Melton, Suffolk	Conditionally Allowed	Unknown	2.7	Outline planning for a residential development for 180 dwellings (8.27ha in size) to include open space and provision of ecological habitat areas.	High	No	No overlap with landfall, onshore cable route or substation(s) location.

24.7.3 Assessment of Cumulative Impacts

24.7.3.1 East Anglia ONE and A future East Anglia Project

212. The onshore construction of East Anglia ONE and a future East Anglia project would not overlap with that for the proposed East Anglia THREE project, and consecutive construction is considered unlikely. There is still however the potential, on a worst case basis, for the separate construction processes to follow on relatively quickly from each other, albeit not in sequential years. This could lead, on a worst case basis (particularly with a Two Phased construction for the proposed East Anglia THREE project), to disturbance over more than one breeding season for Schedule 1 birds or over more than one winter for wintering waders and wildfowl (although temporal and spatial restrictions of East Anglia THREE construction works around brent goose feeding areas would remove any effects on this species) without a full recovery of populations to take place between projects (allowing for restoration period). This potential cumulative disturbance effect was recognised early in project planning, and so a series of measures has been embedded in the project design (see *Table 24.3*). This includes HDD under the Deben Estuary (as part of the East Anglia ONE construction process), pre-installed ducts for the proposed East Anglia THREE project and a future East Anglia project, a Code of Construction Practice and an OLEMS. The latter two include details of control measures relating to managing noise and light sources and the need for pre-construction breeding bird surveys. This has been included in the assessment of the project alone described above, and those measures have all been included in the application for East Anglia ONE.

24.7.3.2 Adastral Park

213. The Adastral Park development, which involves the creation of a residential community of up to 161ha, alongside the existing science campus, has the potential to act cumulatively with the proposed East Anglia THREE project over the period that the proposed East Anglia THREE project is being constructed (cumulative impacts are not predicted in the operational phase). This is because the Adastral Park development has been identified as a source of recreational disturbance to the Deben Estuary and the surrounding farmland. This effect was identified in consultation with Natural England and the local authorities as part of the consideration of the application for East Anglia ONE. Natural England and the local authorities have been concerned about the potential alone impacts of the Adastral Park development and as a result that development has been required to implement avoidance and mitigation measures to remove that potential for disturbance. The requirement for those measures is included in the SCDC adopted Core Strategy. Since the avoidance and mitigation measures have been designed to remove the potential for disturbance resulting from the development, there is no risk of

cumulative impacts and none are predicted. Based on this conclusion, the Adastral Park site can be screened out from the cumulative assessment.

24.7.3.3 Assessment

214. The management and mitigation measures described above have been assessed as providing sufficient management and mitigation of potential habitat loss and disturbance for East Anglia ONE, the proposed East Anglia THREE project and the a future East Anglia project when considered alone. A similar level of magnitude of impact is predicted for each year of construction but this does not necessarily result in a directly additive impact over the whole construction period.

215. **Habitat loss (temporary):** with the majority of temporary habitat effects occurring as part of the East Anglia ONE project, and when the above management and mitigation measures are taken into account, no additional magnitude of impact is predicted when combined with the proposed East Anglia THREE project (Single Phase or Two Phased approach) or a future East Anglia project. The following cumulative impact magnitudes are therefore predicted (*Table 24.16*):

Table 24.16 Cumulative habitat loss (temporary) impact magnitude and significance in Relation to the Onshore Ornithology Receptors.

Receptor	Cumulative impact magnitude	Cumulative impact significance
Marsh harrier	Low	Minor
Cetti's warbler	No change	No change
Breeding birds	Low	Minor
Brent goose	Negligible	Minor
Wildfowl and waders	No change	No change

216. **Disturbance and displacement (temporary):** the majority of construction works and therefore disturbance risks will be associated with East Anglia ONE, and although potential for continued disturbance exists in consecutive years for the proposed East Anglia THREE and a future East Anglia project, this will be of notably lesser magnitude.

217. With the above management and mitigation measures implemented, the cumulative effect will not be additive, and so the following cumulative magnitude of impacts are predicted (*Table 24.17*).

Table 24.17 Cumulative disturbance and displacement (temporary) impact magnitude and significance in Relation to the Onshore Ornithology Receptors.

Receptor	Cumulative impact magnitude	Cumulative impact significance
Marsh harrier	Negligible	Minor
Cetti's warbler	Negligible	Negligible
Breeding birds	Negligible	Negligible
Brent goose	Negligible	Minor
Wildfowl and waders	Negligible	Minor

24.8 Transboundary Impacts

218. No transboundary impacts from the onshore elements of the proposed project have been identified.

24.9 Inter-relationships

219. The inter-relationships that have been identified that potentially affect the same onshore ornithology receptor are set out in *Table 24.18*.

Table 24.18 Potential Inter-relationships

Receptor	Inter-relationship	Addressed in section
Key Breeding Bird Species	Habitat loss (temporary) in the construction phase and disturbance and displacement (temporary) in the construction phase (due to noise, light and the presence of people).	*Section 24.6.1*
Key Non-breeding Bird Species	Habitat loss (temporary) in the construction phase and disturbance and displacement (temporary) in the construction phase (due to noise, light and the presence of people).	*Section 24.6.1*

220. In both cases the potential scale of effects from disturbance and displacement (temporary) over-ride those from habitat loss (temporary) and whilst there is a potential inter-relationship, the assessment of the potential impact of disturbance and displacement (temporary) in *section 24.6.1* provides a sound basis for the conclusion on the significance of impact.

24.10 Summary

221. The potential ecological impacts on onshore ornithological receptors have been assessed that might arise from the construction, operation and decommissioning of the onshore electrical transmission works of the proposed East Anglia THREE project.

222. Consultation has been held with stakeholders, including local authorities, Natural England and the RSPB.

223. The ornithological interest along the onshore cable route has been identified through desk study and surveys in the bird breeding season and in the winter. Breeding Cetti's warbler and marsh harrier, the general breeding bird assemblage, and non-breeding brent goose, avocet and other waterbirds associated with the Deben Estuary were identified to be the focus of the impact assessment.

224. Avoidance and mitigation measures have been embedded through project design. This includes particular measures during the construction stage to avoid or mitigate impacts on breeding Cetti's warbler and marsh harrier and non-breeding brent goose, avocet and other waterbirds. A particular risk identified by consultees of disturbance to brent goose has been avoided by proposing a restriction on intrusive construction activities between the Queens Fleet and the jointing bay compound on the east bank of the Deben Estuary crossing, from 1st November to the end of February.

225. No impacts were identified of greater than minor significance. Those identified impacts of minor significance occurred to marsh harrier, brent goose, the breeding bird assemblage and the other wildfowl and waders and related primarily to disturbance / displacement effects.

226. No cumulative impacts were identified of greater than minor significance. Those identified cumulative impacts of minor significance were due to the proposed project with East Anglia ONE and a future East Anglia project and occurred as a result of the construction phase.

227. No potential transboundary impacts have been identified.

228. The identified potential impacts are summarised in *Table 24.19*.

229. The identified potential cumulative impacts are summarised in *Table 24.20*.

Table 24.19 Potential Impacts Identified for Onshore Ornithology Receptors

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance
Construction				
Habitat loss (temporary): Single Phase	Statutory designated sites	High	No change	None
Habitat loss (temporary): Two Phased	Statutory designated sites	High	No change	None
Habitat loss (temporary): Single Phase	Marsh harrier	Medium	Low	Minor
Habitat loss (temporary): Single Phase	Cetti's warbler	Medium	No change	None
Habitat loss (temporary): Single Phase	Breeding birds	Medium	Low	Minor
Habitat loss (temporary): Single Phase	Brent goose	Medium	Negligible	Minor
Habitat loss (temporary): Single Phase	Other key wildfowl and waders	Medium	No change	None
Habitat loss (temporary): Two Phased	Marsh harrier	Medium	Low	Minor
Habitat loss (temporary): Two Phased	Cetti's warbler	Medium	No change	None
Habitat loss (temporary): Two Phased	Breeding birds	Medium	Low	Minor
Habitat loss (temporary): Two Phased	Brent goose	Medium	Negligible	Minor
Habitat loss (temporary): Two Phased	Other key wildfowl and waders	Medium	No change	None
Disturbance / displacement (temporary):Single Phase	Marsh harrier	High	Negligible	Minor
Disturbance / displacement (temporary):Single Phase	Cetti's warbler	Low	Negligible	Negligible
Disturbance / displacement (temporary):Single Phase	Breeding birds	Low	Negligible	Negligible
Disturbance / displacement (temporary):Single Phase	Brent goose	Medium	Negligible	Minor
Disturbance / displacement (temporary):Single Phase	Other key wildfowl and waders	Medium	Negligible	Minor

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance
Disturbance / displacement (temporary):Two Phased	Marsh harrier	High	Negligible	Minor
Disturbance / displacement (temporary):Two Phased	Cetti's warbler	Low	Negligible	Negligible
Disturbance / displacement (temporary):Two Phased	Breeding birds	Low	Negligible	Negligible
Disturbance / displacement (temporary):Two Phased	Brent goose	Medium	Negligible	Minor
Disturbance / displacement (temporary):Two Phased	Other key wildfowl and waders	Medium	Negligible	Minor
Operation				
Habitat loss (permanent)	Statutory designated sites	High	No change	None
Habitat loss (permanent)	Marsh harrier	Medium	No change	None
Habitat loss (permanent)	Cetti's warbler	Medium	No change	None
Habitat loss (permanent)	Breeding birds	Low	Low	Negligible
Habitat loss (permanent)	Brent goose	Medium	No change	None
Habitat loss (permanent)	Other key wildfowl and waders	Medium	No change	None
Disturbance / displacement (temporary)	Marsh harrier	High	Negligible	Minor
Disturbance / displacement (temporary)	Cetti's warbler	Low	Negligible	Negligible
Disturbance / displacement (temporary)	Breeding birds	Low	Negligible	Negligible
Disturbance / displacement (temporary)	Brent goose	Medium	Negligible	Minor
Disturbance / displacement (temporary)	Other key wildfowl and waders	Medium	Negligible	Minor
Disturbance / displacement (permanent)	Marsh harrier	High	No change	Negligible
Disturbance / displacement (permanent)	Cetti's warbler	Low	No change	Negligible

Potential Impact	Receptor	Value/ Sensitivity	Magnitude	Significance
Disturbance / displacement (permanent)	Breeding birds	Low	Negligible	Negligible
Disturbance / displacement (permanent)	Brent goose	Medium	No change	Negligible
Disturbance / displacement (permanent)	Other key wildfowl and waders	Medium	No change	Negligible
Decommissioning				
Disturbance / displacement (temporary)	Marsh harrier	High	Negligible	Minor
Disturbance / displacement (temporary)	Cetti's warbler	Low	Negligible	Negligible
Disturbance / displacement (temporary)	Breeding birds	Low	Negligible	Negligible
Disturbance / displacement (temporary)	Brent goose	Medium	Negligible	Minor
Disturbance / displacement (temporary)	Other key wildfowl and waders	Medium	Negligible	Minor

Table 24.20 Potential Cumulative Impacts Identified for Onshore Ornithology Receptors

Potential Cumulative Impact	Receptor	Value/ Sensitivity	Magnitude	Significance
Construction				
Habitat loss (temporary)	Marsh harrier	High	Low	Minor
Habitat loss (temporary)	Cetti's warbler	Low	No change	No change
Habitat loss (temporary)	Breeding birds	Medium	Low	Minor
Habitat loss (temporary)	Brent goose	Medium	Negligible	Minor
Habitat loss (temporary)	Other key wildfowl and waders	Medium	No change	No change
Disturbance / displacement (temporary)	Marsh harrier	High	Negligible	Minor
Disturbance / displacement (temporary)	Cetti's warbler	Low	Negligible	Negligible
Disturbance / displacement (temporary)	Breeding birds	Low	Negligible	Negligible
Disturbance / displacement (temporary)	Brent goose	Medium	Negligible	Minor
Disturbance / displacement (temporary)	Other key wildfowl and waders	Medium	Negligible	Minor

24.11 References

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Chapter 24 Ends Here