

East Anglia TWO Offshore Windfarm

Appendix 23.2

Onshore Ornithology Cumulative Impact Assessment with the Proposed East Anglia ONE North Project

Preliminary Environmental Information

Volume 3

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Table of Contents

23.2	Onshore Ornithology Cumulative Impact Assessment with the proposed East Anglia ONE North Project	1
23.1	Introduction	1
23.2	Construction Scenarios Realistic Worst Case	1
23.3	Cumulative Impact Assessment during Construction	9
23.4	Summary	10

Appendix 21.1 is supported by the tables listed below.

Table Number	Title
Table A23.1	Scenario 1 Realistic Worst Case Assumptions
Table A23.2	Scenario 2 Realistic Worst Case Assumptions
Table A23.3	Summary of Scenario 1 and Scenario 2 Realistic Worst Case Assumptions

Glossary of Acronyms

CCS	Construction Consolidation Sites
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
ES	Environmental Statement
HDD	Horizontal Directional Drilling
IOF	Important Ornithological Features
MW	Megawatt
NGET	National Grid Electricity Transmission
PEIR	Preliminary Environmental Information Report
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Construction consolidation sites	Compounds which will contain laydown, storage and work areas for onshore construction works. The HDD construction compound will also be referred to as a construction consolidation site.
Development area	The area comprising the Proposed Onshore Development Area and the Offshore Development Area
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one offshore construction operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Jointing bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links.
Mitigation areas	Areas captured within the Development Area specifically for mitigating expected or anticipated impacts.
National Grid infrastructure	A National Grid substation, connection to the existing electricity pylons and National Grid overhead line realignment works which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines to transport electricity from the National Grid substation to the national electricity grid

National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables and two fibre optic cables.
Indicative onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Proposed onshore development area	A refined version of the indicative onshore development area.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment, both within and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

23.2 Onshore Ornithology Cumulative Impact Assessment with the proposed East Anglia ONE North Project

23.1 Introduction

1. This appendix covers the cumulative impact assessment of the proposed East Anglia TWO project with the proposed East Anglia ONE North project in relation to onshore ornithology
2. The East Anglia ONE North offshore windfarm project (the proposed East Anglia ONE North project) is also in the pre-application stage. The proposed East Anglia ONE North project will have a separate Development Consent Order (DCO) application but is working to the same programme of submission as the proposed East Anglia TWO project. The two projects will share the same landfall location and cable route and the two onshore substations will be co-located and feed into the same National Grid substation.
3. The proposed East Anglia TWO project Cumulative Impact Assessment (CIA) for onshore ornithology will therefore initially consider the cumulative impact with only the East Anglia ONE North project against two different construction scenarios (i.e. construction of the two projects simultaneously and sequentially). The realistic worst case scenario of each impact is then carried through to the main body of the CIA assessment which considers other developments which are in close proximity to the proposed East Anglia TWO project.
4. For a more detailed description of the CIA please refer to **Chapter 5 EIA Methodology**.

23.2 Construction Scenarios Realistic Worst Case

5. This appendix considers the proposed East Anglia TWO project and the proposed East Anglia ONE North project under two construction scenarios:
 - Scenario 1 - the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously; and
 - Scenario 2 - the proposed East Anglia TWO project and the proposed East Anglia ONE North project are built sequentially.

6. As discussed in **section 23.1**, the realistic worst case (based on the assessment of these two construction scenarios) for each impact is then carried through to the wider CIA which considers other developments, projects or plans which have been screened into the CIA assessment for the proposed East Anglia TWO project.
7. It should be noted that the operational phase impacts on onshore ornithology will be the same irrespective of the construction scenario. Therefore, operational impacts identified in Scenario 1 will be the same as those for Scenario 2.
8. Mitigation measures for the proposed East Anglia TWO project and proposed East Anglia ONE North project will be the same. These are detailed in **Chapter 23 Onshore Ornithology**.

23.2.1 Scenario 1

9. **Table A23.1** presents the realistic worst case parameters of Scenario 1. In this instance, the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously.

Table A23.1 Scenario 1 Realistic Worst Case

Impact	Parameter	Notes
Construction		
Impacts related to the landfall	HDD temporary works area: 13,300m ² (70m x 190m) Transition bay excavation footprint (for 4 transition bays): 3,108m ² (37m x 42m) Landfall CCS: 40,950m ² (210m x 195m) Landfall transition bays approximate quantity of spoil material (for 4 transition bays): 908m ³	Landfall to be achieved via HDD. No beach access required.
Impacts related to the onshore cable corridor	Onshore cable route: 574,720m ² (8,980m x 64m) Jointing bay construction excavation footprint: 570m ² (30.6m x 18.6m). Total for 72 jointing bays: 41,040m ² (570m ² x 36) HDD (retained as an option to cross SPA / SSSI): <ul style="list-style-type: none"> • Entrance pit CCS (x1): 13,650m² (195m x 70m) • Exit pit CCS (x1): 5,850m² (195m x 30m) 	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field boundaries or roads as far as practical. Two link boxes sit underground beside each jointing bay at a depth of approximately 1.2m. The construction footprint of these is included in the jointing

Impact	Parameter	Notes
	<p>Onshore cable route CCS: 40,950m² (210m x 195m). Total for 5 CCS: 204,750m² (40,950m² x 5)</p> <p>Temporary roads:</p> <ul style="list-style-type: none"> Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m² Onshore cable route and substation access haul road (9m width): 18,675m² Temporary access road: 23,495m² <p>Onshore cable trench approximate quantity of spoil material: 26,642m³</p>	<p>bay construction excavation footprint.</p>
Impacts related to the onshore substation(s)	<p>Onshore substation CCS: 17,100m² (190m x 90m). Total for 3 CCS: 51,300m²</p> <p>Permanent footprint (used as CCS during construction): 36,100m² (190m x 190m). Total for 2: 72,200m²</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	<p>Construction access is included above as the onshore cable route and substation access haul road.</p>
Impacts related to the National Grid Infrastructure	<p>National Grid substation CCS: 78,750m² (250m x 315m)</p> <p>Permanent footprint (used as CCS during construction): 45,500m² (325m x 140m)</p>	<p>Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description.</p> <p>Construction access is included above as the onshore cable route and substation access haul road.</p> <p>Operational access is included above as the substation operational access road,</p>
Operation		

Impact	Parameter	Notes
Impacts related to the landfall	4 transition bays will be installed underground, each with an operational volume of 227m ³	Transition bays will be buried approximately 1.2m underground – there will no above ground infrastructure.
Impacts related to the onshore cable corridor	72 jointing bays will be installed underground, each with an operational volume of 77m ³ 144 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m ³	Jointing bays will be buried approximately 1.2m underground – there will no above ground infrastructure. Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.
Impacts related to the onshore substation(s)	Operational footprint: 36,100m ² (190m x 190m). Total for 2: 72,200m ² Substation operational access road: 12,800m ² (1,600m x 8m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m ² (325m x 140m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR). Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description .
Decommissioning		
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left <i>in situ</i> . The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.		

23.2.2 Scenario 2

10. Scenario 2 represents the realistic worst case scenario in the eventuality that the proposed East Anglia TWO project and proposed East Anglia ONE North project are built with a construction gap. It is intended that the construction of the proposed East Anglia TWO project will be progressed prior to commencing construction of the proposed East Anglia ONE North project.
11. Scenario 2 assumes that when permission is granted, the proposed East Anglia TWO project will be constructed as soon as permission is granted. The proposed East Anglia ONE North project will leave the largest possible gap (between the reinstatement of the proposed East Anglia TWO project and start of construction for the proposed East Anglia ONE North project) to begin construction within the consent period. Further detail regarding the likely construction gap is provided in **Chapter 5 EIA Methodology**.

Table A23.2 Scenario 2 Realistic Worst Case

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Construction			
Impacts related to the landfall	HDD temporary works area: 7,000m ² (70m x 100m) Transition bay excavation footprint (for 2 transition bays): 1,554m ² (37m x 42m) Landfall CCS: 18,400m ² (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m ³	HDD temporary works area: 7,000m ² (70m x 100m) Transition bay excavation footprint (for 2 transition bays): 1,554m ² (37m x 42m) Landfall CCS: 18,400m ² (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m ³	Landfall to be achieved via HDD. No beach access required.
Impacts related to the onshore cable corridor	Onshore cable route: 287,360m ² (8,980m x 32m) Jointing bay construction excavation footprint: 570m ² (30.6m x 18.6m). Total for 36 jointing bays: 20,520m ² (570m ² x 36) HDD (retained as an option to cross SPA / SSSI): <ul style="list-style-type: none"> Entrance pit CCS (x1): 7,000m² (100m x 70m) 	Onshore cable route: 287,360m ² (8,980m x 32m) Jointing bay construction excavation footprint: 570m ² (30.6m x 18.6m). Total for 36 jointing bays: 20,520m ² (570m ² x 36) HDD (retained as an option to cross SPA / SSSI): <ul style="list-style-type: none"> Entrance pit CCS (x1): 7,000m² (100m x 70m) 	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
	<ul style="list-style-type: none"> Exit pit CCS (x1): 3,000m² (100m x 30m) <p>Onshore cable route CCS: 18,400m² (160m x 115m). Total for 5 CCS: 92,000m² (18,400m² x 5)</p> <p>Temporary roads:</p> <ul style="list-style-type: none"> Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m² Onshore cable route and substation access haul road (9m width): 18,675m² Temporary access road: 23,495m² <p>Onshore cable trench approximate quantity of spoil material: 13,321m³</p>	<ul style="list-style-type: none"> Exit pit CCS (x1): 3,000m² (100m x 30m) <p>Onshore cable route CCS: 18,400m² (160m x 115m). Total for 5 CCS: 92,000m² (18,400m² x 5)</p> <p>Temporary roads:</p> <ul style="list-style-type: none"> Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m² Onshore cable route and substation access haul road (9m width): 18,675m² Temporary access road: 23,495m² <p>Onshore cable trench approximate quantity of spoil material: 13,321m³</p>	<p>boundaries or roads as far as practical.</p> <p>Two link boxes sit underground beside each jointing bay at a depth of approximately 1.2m. The construction footprint of these is included in the jointing bay construction excavation footprint.</p>
Impacts related to the onshore substation	<p>Onshore substation CCS: 17,100m² (190m x 90m)</p> <p>Permanent footprint (used as CCS during construction): 36,100m² (190m x 190m)</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	<p>Onshore substation CCS: 17,100m² (190m x 90m)</p> <p>Permanent footprint (used as CCS during construction): 36,100m² (190m x 190m)</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	<p>Construction access is included above as the onshore cable route and substation access haul road.</p>
Impacts related to the National Grid Infrastructure	<p>National Grid substation CCS: 78,750m² (250m x 315m)</p> <p>Permanent footprint (used as CCS during construction): 45,500m² (325m x 140m)</p>	<p>National Grid substation CCS: 78,750m² (250m x 315m)</p> <p>Permanent footprint (used as CCS during construction): 45,500m² (325m x 140m)</p>	<p>Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed</p>

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
			<p>and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description.</p> <p>Construction access is included above as the onshore cable route and substation access haul road.</p> <p>Operational access is included above as the substation operational access road,</p>
Operation			
Impacts related to the landfall	2 transition bays will be installed underground, each with an operational volume of 227m ³	2 transition bays will be installed underground, each with an operational volume of 227m ³	Transition bays will be buried approximately 1.2m underground – there will no above ground infrastructure.
Impacts related to the onshore cable corridor	<p>36 jointing bays will be installed underground, each with an operational volume of 77m³</p> <p>72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m³</p>	<p>36 jointing bays will be installed underground, each with an operational volume of 77m³</p> <p>72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m³</p>	<p>Jointing bays will be buried approximately 1.2m underground – there will no above ground infrastructure.</p> <p>Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.</p>

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Impacts related to the onshore substation	Operational footprint: 36,100m ² (190m x 190m) Substation operational access road: 12,800m ² (1,600m x 8m)	Operational footprint: 36,100m ² (190m x 190m) Substation operational access road: 12,800m ² (1,600m x 8m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m ² (325m x 140m)	National Grid operational substation: 45,500m ² (325m x 140m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR). Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description .
Decommissioning			
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left <i>in situ</i> . The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.			

23.3 Cumulative Impact Assessment during Construction

12. The following sections discuss which of the two construction scenarios detailed in **section 23.2** will be the realistic worst case in terms of impacts to onshore ornithology.

23.3.1 Impact 1: Habitat Loss

13. The results from baseline onshore ornithology surveys presented in **section 23.5** of **Chapter 23 Onshore Ornithology** and in **Figures 23.3** to **23.9**, and the subsequent assessment of construction effects in **section 23.6.3** of **Chapter 23 Onshore Ornithology** show that in general the indicative onshore development area has relatively little suitable habitat for most Important Ornithological Features (IOFs), with few breeding territories recorded within this area. Most IOF territories were recorded within the adjacent Sandlings Special Protection Area (SPA) and Leiston-Aldeburgh Site of Special Scientific Interest (SSSI), and so direct habitat loss is not considered to be significant for any IOFs at a regional population level.
14. There does remain a possibility that a loss of foraging or nesting habitat would occur for some IOFs, e.g. turtle dove and yellow wagtail. In this respect, it is considered that although a smaller amount of habitat would be unavailable at any one time compared to the alternative scenario, Scenario 2 would represent the worst-case. The impacts of the increased duration of temporary habitat loss described under Scenario 2 (considered to be medium-term rather than short-term as they would, combined, last for over five years, as per **Table 23.9** of **Chapter 23 Onshore Ornithology**) would mean that breeding birds may be affected for up to six breeding seasons (and potentially more if habitats do not have time to be fully reinstated between projects), which would increase the possibility of territories being abandoned beyond the construction period and over the long-term.
15. Although the duration of impact is therefore extended under Scenario 2 from short-term to medium-term, the overall significance of effects on regional or Leiston-Aldeburgh SSSI populations are unchanged for each IOF from those predicted in **section 23.6.3.1** of **Chapter 23 Onshore Ornithology** for the proposed East Anglia TWO project alone, because in both cases it is assumed as a worst-case, that the territories that would potentially be lost to the population due to the proposed East Anglia TWO project would be the same as those potentially affected by the proposed East Anglia ONE North project.
16. Therefore, **no additional residual cumulative impacts** above those predicted for the proposed East Anglia TWO project alone are predicted (i.e. Minor adverse and Not Significant for all IOFs if similar mitigation measures are implemented

for both the proposed East Anglia TWO and proposed East Anglia ONE North projects).

23.3.2 Impact 2: Construction Disturbance

17. Although temporary, unmitigated construction disturbance has the potential to affect IOFs over a wider spatial extent than direct habitat loss, and therefore has a greater potential to result in a significant effect on the IOFs. It is considered that Scenario 2 would have a greater potential for an unmitigated significant effect due to the increased duration of construction activities (2 x 3 years), despite a slightly larger footprint associated with Scenario 1.
18. The impacts of the increased duration of construction activities described under Scenario 2 (considered to be medium-term rather than short-term, as per **Table 23.9** of **Chapter 23 Onshore Ornithology**) would mean that breeding birds may be affected for up to six breeding seasons, which would increase the possibility of territories being abandoned beyond the construction period and over the long-term.
19. Although the duration of impact is therefore extended under Scenario 2 from short-term to medium-term, the overall significance of effects on regional or Leiston-Aldeburgh SSSI populations are unchanged for each IOF from those predicted in **section 23.6.3.2 of Chapter 23 Onshore Ornithology** for the proposed East Anglia TWO project alone, because in both cases it is assumed as a worst-case, that the territories that would potentially be lost to the population due to the proposed East Anglia TWO project would be the same as those potentially affected by the proposed East Anglia ONE North project.
20. Therefore, **no additional residual cumulative impacts** above those predicted for the proposed East Anglia TWO project alone are predicted (i.e. Negligible or Minor adverse and Not Significant for all IOFs if similar mitigation measures are implemented for both projects).

23.4 Summary

21. **Table A23.3** gives an overarching summary of which of the two construction scenarios, detailed above, will be the realistic worst case in terms of impacts relating to onshore ornithology.

Table A23.3 Summary of Scenario 1 and Scenario 2 Realistic Worst Case Assumptions

Impact	Worst Case	Notes
Impact 1: Impacts relating to habitat loss	Scenario 2	Scenario 2 is deemed a worst case due to the longer construction duration, therefore potentially disrupting more breeding seasons of IOFs.
Impact 2: Impacts relating to construction disturbance	Scenario 2	Scenario 2 is deemed a worst case due to the longer construction duration, therefore potentially disrupting more breeding seasons of IOFs.

22. Overall, construction Scenario 2 creates a realistic worst case in terms of impacts to onshore ornithology. Therefore, Scenario 2 will be carried through into the wider CIA with other developments, see **section 23.7** in **Chapter 23 Onshore Ornithology**.