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23 TERRESTRIAL ECOLOGY

23.1 Introduction

23.1.1 This Chapter of the Environmental Statement (ES) assesses the potential impacts of the onshore electrical connection (and associated onshore infrastructure) for Galloper Wind Farm (GWF) on terrestrial ecology by addressing the implications on terrestrial and freshwater habitats (including designated sites); and the flora and fauna found within the site and in the surrounding area above Mean High Water Springs (MHWS). This assessment includes both positive and negative impacts, for the construction, operation, and decommissioning phases of the development. Details of the proposed mitigation that will be undertaken by Galloper Wind Farm Limited (GWFL) are also provided.

23.1.2 Matters relating to coastal and marine ornithological interests are discussed separately in Chapter 11 Ornithology, which also includes details of a Habitats Regulations Assessment that has been undertaken as part of the GWF project. Habitats and species below MHWS are considered separately within Chapter 12 Marine and intertidal ecology. Designated sites (both onshore and offshore) are also considered together within Chapter 8 Designated Sites.

23.1.3 For the purposes of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Figures 23.1, 23.2, 23.3, 23.5 and 23.7 taken together with this Chapter, fulfil the requirements of Regulation 5(2)(l) in relation to the effects of the proposed development on terrestrial ecology.

23.2 Guidance and Consultation

Legislation, policy and guidance

23.2.1 National Policy Statements (NPS) provide the primary basis on which the Infrastructure Planning Commission (IPC) is required to make its decisions. In preparing this chapter the following NPS were reviewed:

- Overarching National Policy Statement (NPS) for Energy (EN-1) (DECC, 2011a); and

23.2.2 The specific assessment requirements for terrestrial ecology, as detailed within the NPSs, are repeated in the following paragraphs. The assessment requirements suggested within the NPSs have been applied to this assessment and where appropriate the specific sections of this Chapter that address the issues are indicated. Where any part of the NPS guidance has not been followed within this assessment, it is stated after the NPS text and a justification provided.
23.2.3 EN-5 is the primary decision-making guidance document for the IPC on nationally significant electricity network infrastructure in England and Wales. This document does not specifically consider terrestrial ecology impacts, other than the potential for bird strike on overhead power lines. The potential for bird strike has not been assessed within this Chapter given the very minor nature of the proposed lines associated with GWF.

23.2.4 EN-1 contains generic requirements for the assessment of impacts on terrestrial ecology (broadly termed as “Biological and Geological Conservation” within that NPS).

23.2.5 In relation to the general assessment considerations, Section 5.3.3 of the NPS states that: “Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity”.

See Sections 23.6, 23.7 and 23.8 for ecological sites. Geological sites are considered separately within Chapter 22 Geology, Hydrogeology, Land Quality and Flood Risk).

23.2.6 Section 5.3.4 of EN-1 continues with: “The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests”.

Opportunities to enhance biodiversity interests are considered within the mitigation outlined within Sections 23.6 and 23.7.

23.2.7 The ecological assessment was undertaken with reference to the following legislation and guidance documents:

EU Habitats Directive (Council Directive 92/43/EEC) (referred to throughout this assessment as the ‘Habitats Regulations’)

23.2.8 The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe’s nature conservation policy. The directive protects over 1,000 animals and plant species and over 200 habitat types, which are of European importance.

Wildlife and Countryside Act 1981 (as amended)


Protection of Badgers Act 1992


Countryside Rights of Way ( CRoW ) Act 2000

23.2.12 A list of habitats and species of principal importance for the conservation of biological diversity in England has been produced by the Secretary of State for Environment, Food and Rural Affairs, in compliance with Section 74(2) of the Countryside and Rights of Way Act 2000. The need to avoid or mitigate impacts on the species and habitats identified within these documents has been recognised in this assessment.

Suffolk Biodiversity Action Plan Review 2011

23.2.13 Biodiversity Action Plans (BAPs) are strategies to conserve, protect and enhance biodiversity. The UKBAP sets out a national strategy for the conservation of biodiversity, and local BAPS (LBAPS) have also been produced to address biodiversity issues specific to particular areas in the UK. The LBAP relevant to this project is the Suffolk BAP.


23.2.14 The guidelines provide a recommended procedure for the ecological component of Environmental Impact Assessment. The guidelines aim to:

- Promote a scientifically rigorous and transparent approach to Ecological Impact Assessment (EcIA);
- Provide a common framework to EcIA in order to promote better communication and closer cooperation between ecologists involved in EcIA; and
- Provide decision-makers with relevant information about the ecological impacts associated with a project, positive and negative.

Consultation

23.2.15 As part of ongoing consultation, key stakeholders were invited to respond to a scoping document produced as part of the EIA process (GWFL, 2010).
Table 23.1 summarises issues that were highlighted by the consultees in the IPC Scoping Opinion (IPC, 2010) and indicates which sections of the assessment address each issue.

23.2.16 Further consultation was undertaken through formal Section 42 consultation under the Planning Act 2008 (see Chapter 7 Consultation) via the submission of a Preliminary Environmental Report (PER). Community consultation under Section 47 has also been carried out in parallel with the Section 42 statutory consultation. The process for community consultation is set out in a Statement of Community Consultation (SoCC) (see Chapter 7). Table 23.1 also summarises issues that were highlighted throughout the consultation period.

23.2.17 Full details of responses received are presented in the IPC Scoping Opinion report (IPC, 2010) and the Consultation Report that accompanies the Development Consent Order (DCO) for this application.

Table 23.1 Summary of consultation and issues

<table>
<thead>
<tr>
<th>Date</th>
<th>Consultee</th>
<th>Summary of issue</th>
<th>Section where addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2010</td>
<td>Natural England</td>
<td>NE confirmed that the ecological surveys carried out in 2006 - 2008 were sufficient to inform an EIA of the preferred substation option.</td>
<td>See comments below.</td>
</tr>
<tr>
<td>August 2010</td>
<td>IPC (Scoping Opinion)</td>
<td>The IPC stated that the ecological surveys were out of date and should be repeated.</td>
<td>Following successfully negotiating access to the land relevant ecological surveys were updated during 2010 and 2011.</td>
</tr>
<tr>
<td>August 2010</td>
<td>Leiston-cum-Sizewell town Council (Scoping Opinion)</td>
<td>There should be a careful assessment of the damage done to the beach by the current works and clear indications of how it can be mitigated during the construction phase of Galopper.</td>
<td>A baseline assessment of the beach area is set out in Section 23.4. Mitigation measures to minimise impacts from GWF construction works are set out in Section 23.6</td>
</tr>
<tr>
<td>Date</td>
<td>Consultee</td>
<td>Summary of issue</td>
<td>Section where addressed</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>November 2010</td>
<td>Natural England</td>
<td>The existing survey dataset (2006-2008) are still a valid dataset on which to base the ecological elements of the EIA for a submission in 2011. Issues raised included: loss of habitats (pasture, trees), and also potential impacts to the nearby SSSI should plans ultimately require a cable route to pass under the SSSI.</td>
<td>Further ecological surveys (badger, bat habitat, bat activity, reptile and botanical) were carried out in 2010 - 2011. Loss of habitats is assessed in Section 23.6. The proposed development avoids the need to route cables under the SSSI.</td>
</tr>
<tr>
<td>December 2010</td>
<td>Suffolk Wildlife Trust</td>
<td>Impacts along foreshore associated with heavy plant access.</td>
<td>Impacts along the foreshore are considered in Section 23.6. The main planting proposals will take place on the landform surrounding the GWF compound. This is reliant on the major earthworks associated with construction, which will be undertaken with the main onshore works.</td>
</tr>
<tr>
<td>March 2011</td>
<td>Suffolk Wildlife Trust</td>
<td>Potential impacts on Sizewell Marshes SSSI associated with routing cables under the SSSI.</td>
<td>The proposed development avoids the need to route cables under the SSSI. Mitigation of indirect impacts is considered in and 23.6.</td>
</tr>
<tr>
<td>June 2011</td>
<td>Public Exhibitions (Section 42)</td>
<td>A range of concerns relating to impacts on local wildlife, including bats, reptiles, birds and badgers.</td>
<td>Impacts to these groups, during construction and operation, are considered within Sections 23.6 and 23.7.</td>
</tr>
<tr>
<td>July 2011</td>
<td>Natural England and Joint Nature Conservation Committee</td>
<td>Further detail required on mitigation strategy to fully demonstrate there will be no impact on Sizewell Marshes SSSI or shingle habitats.</td>
<td>Mitigation measures and an assessment of residual impacts are set out in sections 23.6.</td>
</tr>
<tr>
<td>Date</td>
<td>Consultee</td>
<td>Summary of issue</td>
<td>Section where addressed</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>July 2011</td>
<td>Royal Society for the Protection of Birds (RSPB)</td>
<td>Some of the protected species surveys are out of date and thus should be repeated.</td>
<td>Further surveys were carried out in 2010-11</td>
</tr>
<tr>
<td></td>
<td>(Section 42)</td>
<td>Further details on the management and design of landscape mitigation areas are required.</td>
<td>Further details on the landscape mitigation areas are included in Chapter 20 Seascape, Landscape and Visual Impact.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impacts on the Heronry at Sizewell Wents should be further addressed.</td>
<td>Herons are considered in Section 23.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further consideration of bat surveys undertaken in the wider area is required to demonstrate the importance of the surrounding landscape.</td>
<td>Bat surveys undertaken in the wider area are discussed in Section 23.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concern over time available to develop and implement a detailed reptile mitigation strategy.</td>
<td>Further details of the reptile translocation strategy are provided in Section 23.6.</td>
</tr>
<tr>
<td>July 2011</td>
<td>Suffolk Wildlife</td>
<td>Many of the ecological surveys are out of date and should be repeated.</td>
<td>Surveys updated during 2010 and 2011.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further detail is required on proposed lighting and traffic movements (construction and operation) to confirm impacts upon designated sites, birds and bats</td>
<td>These are discussed within Section 23.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impacts on potential heathland restoration proposed for the Broom Covert area need to be addressed.</td>
<td>Broom covert is already classed as lowland heathland. Impacts to this area are considered within Section 23.6.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further detail on biodiversity benefits for birds and bats needs to be provided.</td>
<td>Refer to mitigation measures outlined throughout this chapter</td>
</tr>
<tr>
<td>July 2011</td>
<td></td>
<td>Suitable mitigation must be provided.</td>
<td>Mitigation is discussed</td>
</tr>
<tr>
<td>Date</td>
<td>Consultee</td>
<td>Summary of issue</td>
<td>Section where addressed</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>July 2011</td>
<td>Suffolk County Council (Section 42)</td>
<td>Bat surveys are out of date and need updating. This should be confirmed with Natural England, particularly in light of more recent surveys in the Sizewell estate (which show foraging activity of considerable importance).</td>
<td>Surveys updated during 2010 and 2011.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Further details of the reptile translocation strategy are provided in Section 23.6.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Included within mitigation</td>
</tr>
<tr>
<td>July 2011</td>
<td>Suffolk Coasts and Heaths AONB Unit (Section 42)</td>
<td>Bat surveys are out of date and need updating.</td>
<td>Surveys updated during 2010 and 2011.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Further details of the reptile translocation strategy are provided in Section 23.6.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Included within mitigation</td>
</tr>
<tr>
<td>July 2011</td>
<td>Suffolk Coastal</td>
<td>Further details of the potential</td>
<td>Details of the reptile</td>
</tr>
<tr>
<td>Date</td>
<td>Consultee</td>
<td>Summary of issue</td>
<td>Section where addressed</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>July 2011</td>
<td>Forestry Commission (Section 42)</td>
<td>It needs to be confirmed if Sizewell Wents woodland classifies as Ancient Woodland.</td>
<td>Sizewell Wents is a young plantation woodland planted in the early 1940s/1950s as part of Sizewell A landscaping. Details provided in Section 23.4.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tree loss associated with woodland and individual (non-woodland) trees should be replaced at a ratio of 6:1.</td>
<td>The woodland is a young plantation woodland. The landscaping proposals include the creation of habitats in keeping with the wider heathland restoration vision. See Section 23.6.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replaced trees should have an adequate maintenance and management plan to ensure successful establishment.</td>
<td>Included within mitigation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Native species should be used for any replanting.</td>
<td>Included within mitigation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The translocation of soils from woodland to be lost to new woodland planting areas should be undertaken to build seed banks and encourage species associated with the original woodland.</td>
<td>The woodland is young in nature with a generally poor seed bank (low species diversity and a number of non-native species); however, the earthworks proposals will seek to undertake soil translocation where practicable.</td>
</tr>
</tbody>
</table>

### 23.3 Methodology

#### Study area

23.3.1 The onshore development footprint (as shown in Figure 1.3) encompasses the GWF substation (comprising the GWF compound and transmission compound) and sealing end compounds and associated laydown areas and access tracks. It also includes the footprint of all cable corridors above Mean...
High Water Spring (MHWS) to the GWF substation including the onshore transition bays and directional drilling works, and the cabling between the GWF substation and the sealing end compounds. The study area includes this development footprint and any adjacent habitats that may potentially be impacted by the proposed development.

23.3.2 Habitats below MHWS are considered within Chapter 12 Marine and Intertidal Ecology.

Characterisation of the existing environment

23.3.3 There is a substantial amount of available data associated with the previous Greater Gabbard Offshore Wind Farm (GGOWF) studies, and its subsequent mitigation and monitoring programmes. The data available includes:

- Extended Phase 1 Habitat surveys (2005 and 2006) (CMACS, 2005; ESL, 2006);
- Breeding bird surveys (2005, 2006 and 2008) (BTO, 2006; ESL, 2006);
- Great crested newt surveys (2005 and 2006) (CMACS, 2005; ESL, 2006);
- Mammal surveys – including badgers, bats, water vole, otter and other protected mammals (2006) (ESL, 2006);
- Reptile surveys (2006 and 2007) (ESL, 2006; ESL, 2007a); and

23.3.4 The geographical extent of these surveys encompasses all areas considered for the GWF onshore project aspects. However, additional surveys were undertaken during 2010 to update these datasets. Furthermore in response to Natural England’s (NE) request following Section 42 consultation, additional surveys were also undertaken in 2011. These included:

- Extended Phase 1 Habitat survey 2010 (including detailed botanical assessments) (The Ecology Consultancy, 2010);
- National Vegetation Classification (NVC) survey of Broom Covert 2011 (The Ecology Consultancy, 2011);
- Bat roost potential and activity surveys (The Ecology Consultancy 2011);
- Reptile surveys 2010 and 2011 (The Ecology Consultancy, 2010 and 2011);
- Badger survey 2010 (The Ecology Consultancy, 2010); and
23.3.5 The 2010 and 2011 suite of ecological surveys are provided as Appendices 23.A and 23.B respectively.

**Extended Phase 1 Habitat survey (2005, 2006, 2009 and 2010)**

23.3.6 Extended Phase 1 Habitat surveys were undertaken of the works footprint in May 2005, April 2006, and October 2010 in order to map and characterise each habitat and plant community.

23.3.7 Habitats were described and mapped following standard Phase 1 habitat survey methods (JNCC 1993). All plant species names were given according to Stace (2010). All hedgerows were assessed against the criteria for wildlife and landscape given in the Hedgerow Regulations (1997).

**Hedgerow survey (2011)**

23.3.8 Hedgerow surveys were undertaken as part of the Phase 1 Habitat surveys; however, a further specific survey was undertaken in August 2011 of the only hedgerow to be directly impacted by the works, this being the section of hedgerow to the south of Broom Covert. The hedgerow was assessed against the criteria for wildlife and landscape given in the Hedgerow Regulations (1997).

**Great crested newt surveys (2005 and 2006)**

23.3.9 An assessment of habitat suitability, in the vicinity of the proposed works footprint, was undertaken in May 2005 and again in April 2006. Standard great crested newt survey methods (English Nature, 2001) were then undertaken. This included egg searching, netting, refuge searches, and torch surveys of the relevant ponds and ditches in May / June 2005 (single visit) and April to June 2006 (four visits).

**Badger surveys (2006, 2010 and 2011)**

23.3.10 Full badger surveys were undertaken in April 2006 (as part of the dedicated mammal survey) and October 2010. All suitable habitat was searched for signs of use by badgers including setts, runs, footprints, latrines and dung pits, hairs and feeding signs such as snuffle holes, and scratched trees. Badger usage in the area was minimal and no further surveys (e.g. bait marking) or analysis was required to determine badger population size or density. A walkover survey was undertaken in August 2011 to confirm use of known setts within or close to the works footprint.


23.3.11 Bat roost potential and bat activity surveys were undertaken in May to July 2006 (as part of the dedicated mammal survey) and July / August 2007. The surveys focussed on trees within the Sizewell Wents woodland as well as linear hedgerow features in the vicinity of the proposed works footprint.

23.3.12 A walkover of the site was carried out on 12th August 2011 to reassess the level of potential to support roosting bats of the trees within the onshore
development footprint. A search for signs of use by bats was undertaken from ground level using close focusing binoculars, following good practice guidelines for inspection surveys recommended by the Bat Conservation Trust (2007). Trees identified as having medium or high potential were climbed on 27th September 2011 and suitable features were inspected using an endoscope by a licensed bat worker.

23.3.13 During the 2011 survey a suitable transect route was also walked by the surveyors. Methodologies for bat activity surveys were based on those described in Bat Conservation Trust (2007) and Mitchell-Jones and McLeish (2004). All bat activity along the transect route was recorded using Anabat SD-1 or SD-2 detectors and areas of bat activity were mapped to provide an indication of how bats are using the landscape and which features are likely to be of particular importance. Two transects were carried out during August 2011 each lasting approximately two hours. Transects were started approximately 30 minutes after sunset to ascertain the level of foraging and commuting activity.

23.3.14 During August and September 2011 remote recording devices (Anabat SD-1 or SD-2) were also deployed in areas of potential commuting and/or foraging areas and adjacent to trees considered to have potential to support roosting bats. The detectors were left in place for between one to three nights and collected a total of six full nights (dusk to dawn) data. Up to three detectors were used on any one night and on each occasion detectors were positioned on the ground with the microphone facing upwards, thereby recording overhead bat activity. The full findings of the 2011 survey are included within Appendix 23.B.

Water vole and otter (2006)

23.3.15 As part of the dedicated mammal survey all water bodies within 500m of the GGOWF were searched for any signs of use by water vole or otter in April 2006. No water bodies will be directly affected by the proposed works.

Bird surveys (2005, 2006 and 2008)

23.3.16 Breeding bird mapping surveys were carried out in both 2005 and 2006 over the immediate and wider footprint of the proposed GGOWF works. Six visits were carried out in each year, between late March and late June in 2005, and between early April and mid June in 2006.

23.3.17 A pre-construction breeding bird survey was undertaken for the GGOWF construction footprint in February 2008 (single visit).


23.3.18 Reptile surveys including visual searching for reptiles and the use of artificial refugia placed in areas of suitable habitat were undertaken in April-July 2006 over eight individual visits, as part of the GGOWF survey effort. More
intensive surveys were carried out in 2007 in order to obtain an estimate of the existing populations of reptiles. This comprised visual searching and checking of tins and refuges two to four times throughout the day on seven dates over August 2007. These surveys were focussed on suitable habitat within and adjacent to the GGOWF development footprint.

23.3.19 A reptile exclusion and relocation exercise was undertaken in advance of woodland clearance for the construction of the GGOWF substation during October 2007. Standard reptile exclusion fencing was erected in order to separate the development footprint from adjacent habitats. The trapping effort comprised a daily site presence by an experienced reptile handler for a total of 17 days during October 2007.

23.3.20 Additional reptile surveys were undertaken between August and September 2010 and August 2011, specifically considering the GWF onshore development footprint. The 2010 survey area included habitats along the proposed landfall site and cable corridor, but due to access restrictions the footprint of the proposed GWF substation was not surveyed. Full access was granted in 2011 and, as such, further reptile surveys were undertaken within the proposed substation site and within the proposed reptile translocation area.

23.3.21 The assessment of reptile population sizes followed Froglife (1999) guidance, with population size for the site assigned to one of three categories based on the peak count of adult individuals recorded on a single survey visit (Table 23.2).

Table 23.2 Maximum numbers of reptiles recorded for estimating population sizes (Froglife, 1999)

<table>
<thead>
<tr>
<th>Species</th>
<th>Population Size</th>
<th>Good (score 2 points)</th>
<th>Exceptional (score 3 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (score 1 point)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adder</td>
<td>&lt; 5</td>
<td>5 – 10</td>
<td>&gt; 10</td>
</tr>
<tr>
<td>Grass Snake</td>
<td>&lt; 5</td>
<td>5 – 10</td>
<td>&gt; 10</td>
</tr>
<tr>
<td>Common Lizard</td>
<td>&lt; 5</td>
<td>5 – 20</td>
<td>&gt; 20</td>
</tr>
<tr>
<td>Slow Worm</td>
<td>&lt; 5</td>
<td>5 – 20</td>
<td>&gt; 20</td>
</tr>
</tbody>
</table>

Note: Figures in the table refer to maximum number of adults seen by observation and/or under tins (placed at a density of 10 per hectare), by one person in one day.

23.3.22 Froglife (1999) is also the basis for the selection of Key Reptile Sites. Certain sites may qualify for Key Reptile Site status and this may in turn lead to their designation as a County Wildlife Site (CWS). Table 23.2 summarises the method used for calculating population class size.

23.3.23 To qualify for the Key Reptile Site Register a site must meet at least one of the following criteria:
• It supports three or more reptile species;
• It supports two snake species;
• It supports an exceptional population of one species;
• It supports an assemblage of species scoring a total of at least 4 points; or
• The site does not satisfy the above criteria but is of particular regional importance due to local rarity.

Additional datasets

23.3.24 In addition to the surveys described previously, baseline information was compiled through a desk study and consultation with key stakeholders. Of particular note is the ongoing ecological monitoring that is undertaken throughout the Sizewell Estate (land between Sizewell Gap and Minsmere Nature Reserve). Data from this monitoring programme has also been used to provide a contextual dataset, and includes:

• Sizewell First Interim Bird Report (Entec, 2008a);
• Sizewell Bittern Survey Report (Entec, 2008b);
• Sizewell Marsh Harrier Survey Report (Entec, 2008c);
• Sizewell Bat Survey Report (Entec, 2011a);
• Sizewell Little Tern Survey Report (Entec, 2011b)
• Sizewell Water Vole Report (Entec, 2011c);
• Sizewell Invertebrate Report (Entec, 2011d); and
• Sizewell Badger Report (Entec, 2011e);

Assessment of impacts

23.3.25 Impacts to terrestrial ecology have been assessed based on an approach adapted from the Guidelines for Ecological Impact Assessment (EcIA), which have been drawn up by the Institute of Ecology and Environmental Management (IEEM) (2006). These guidelines have been developed to promote good practice in EcIA relating to terrestrial, freshwater and coastal environments to the mean low water mark in the UK.

23.3.26 The approach to the assessment of impacts on terrestrial ecology can be summarised as follows:

1. Identification of the resource (baseline conditions);
2. Evaluation of the resource (assessment of value);
3. Identification of potential impact;
4. Determination of the effect of the impact;
5. Determination of the magnitude of the effect;
6. Assessment of the significance of any identified effect; and
7. Identification of any necessary mitigation or monitoring measures.

**Evaluation of the resource**

23.3.27 Determining value for ecological features (e.g. reptile populations) can be undertaken using a range of criteria (e.g. economic replacement costs for ecosystem services; aesthetic/societal attributes), but typically rarity is utilised in environmental impact assessment as the most appropriate measure of value. For the purposes of this assessment, a suite of criteria have been used, as shown in **Table 23.3**, which take into account current levels of conservation concern and incorporate, where appropriate, an aspect of geographical definition (e.g. national, regional or local significance/importance).

**Table 23.3** Assessment of the value of ecological resources

<table>
<thead>
<tr>
<th>Value</th>
<th>Habitats</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Internationally designated or proposed sites, such as Ramsar sites, Special Protection Areas, Biosphere Reserves, Special Areas of Conservation, or otherwise meeting criteria for international designation. A viable area of a habitat listed in Annex 1 of the Habitats' Directive.</td>
<td>Sites supporting populations of internationally or European important species. Any regularly occurring population of an internationally important species which is rare or threatened in the UK, i.e., a UK Red Data Book species, or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP), or of uncertain conservation status or of global conservation concern in the UK BAP.</td>
</tr>
<tr>
<td>National</td>
<td>Nationally designated sites such as Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria, National Nature Reserves (NNRs), Marine Nature Reserves, Nature Conservation Review Grade 1 sites. A viable area of a priority habitat identified in the UK BAP, or of smaller areas of habitat which are essential to maintain the viability of a larger whole.</td>
<td>Any regularly occurring population of a nationally important species which is threatened or rare at a regional scale (see local BAP). A regularly occurring, regionally significant population of any nationally important species. A regularly occurring, regionally significant population of any nationally important species during a critical phase of its life cycle.</td>
</tr>
<tr>
<td>County</td>
<td>County sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation including Local Nature Reserves selected on County criteria</td>
<td>Sites supporting viable breeding populations of species known to be rarities on a county scale. A regularly occurring, locally significant number of a county important species during a critical</td>
</tr>
<tr>
<td>Value</td>
<td>Habitats</td>
<td>Species</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>(e.g. County Wildlife Sites).</td>
<td>phase of its life-cycle.</td>
</tr>
<tr>
<td>Local (district, parish scales)</td>
<td>Locally designated or undesignated sites of varied quality containing habitat types of local interest, including amenity and educational functions. Areas of habitat considered to enrich appreciably the habitat resource of a parish e.g., species-rich hedgerows</td>
<td>Sites supporting viable breeding populations of species known to be rarities on a local scale. A regularly occurring, locally significant number of a locally important species during a critical phase of its life-cycle.</td>
</tr>
<tr>
<td>Negligible</td>
<td>Low grade and widespread habitats. No value beyond project site</td>
<td>Sites or areas which support few or no communities or species populations of nature conservation interest. No value beyond project site</td>
</tr>
</tbody>
</table>

**Identification of potential impact and determination of the effect of the impact**

23.3.28 The identification of the potential impact and determination of the effect of this impact is done through expert judgement following a review of the nature of the site, ecological receptor and the proposed works through consultation, surveys and desk studies. Some of the key elements to this are the legal protection afforded to the receptor, current and future trends associated with the ecological resource and identification of any mitigation which may assist in minimising or avoiding the impact.

**Legal protection of species**

23.3.29 Notwithstanding the above, there is also a need to identify all legally protected species that could be affected by the proposed development in order that measures can be taken to ensure that contravention of the relevant legislation is avoided. This may include the adoption of mitigation which is acceptable to Natural England. Effects on such species have to avoid contravention of the law, as otherwise the development cannot be progressed.

**Prediction of trends**

23.3.30 Once the value of the ecological resource has been assessed it is necessary to consider possible future trends in the status of these habitats and species in order to attempt to predict whether the resource, in the absence of development, would experience any change in value in biodiversity conservation terms. This is done by examining information on local and national trends in species where known (such as published trends in bird species), and considering any species or habitat action plans within the UKBAP and the Suffolk BAP which may result in medium or long term quantitative or qualitative changes in habitats or species. Such changes could result in the future value of the undeveloped site increasing or decreasing.
**Determination of the magnitude of the effect (nature and scale of effect)**

23.3.31 Ecological receptors are usually sites, habitats, species assemblages / communities or populations or groups of a species. Effects can be permanent or temporary, being short-term (one season / generation), medium-term, or long-term (more than ten seasons / generations); direct or indirect, and can be cumulative. Wherever possible, the scale of the effect is quantified. These factors are brought together and used to assign the magnitude of the effect, as defined in Table 23.4.

<table>
<thead>
<tr>
<th>Magnitude of Effect</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>High adverse</td>
<td>Impact is large scale giving rise to substantial concern. The change is likely to cause a permanent adverse effect on the receptor. It should be considered unacceptable and require mitigating, compensating or a significant change to the development if no alternative is available. If no mitigation is possible then the impact will require a value judgment as to its acceptability.</td>
</tr>
<tr>
<td>Medium adverse</td>
<td>The impact gives rise to some concern but is likely to be tolerable in the short-term. Or there is considered to be a lower risk of the event occurring at all. Mitigation to reduce the impact should be sought or the issue will require a value judgment as to its acceptability.</td>
</tr>
<tr>
<td>Low adverse</td>
<td>The impact is small, being undesirable but acceptable. Or there is considered to be a very low risk of the event occurring at all.</td>
</tr>
<tr>
<td>Negligible</td>
<td>The impact is sufficiently small as to be indeterminable and of no concern. Or there is considered to be almost no risk of the event occurring at all.</td>
</tr>
<tr>
<td>Low positive</td>
<td>The impact is sufficiently small and of slight significance providing some benefit to the environment.</td>
</tr>
<tr>
<td>Medium positive</td>
<td>The impact provides a positive environmental gain</td>
</tr>
<tr>
<td>High positive</td>
<td>The benefit is large scale providing a significant positive environmental gain. The change is likely to cause a permanent beneficial effect on the receptor.</td>
</tr>
</tbody>
</table>

**Significance of effect**

23.3.32 The significance of an effect is largely a product of the value of the ecological resource and the magnitude of effect on it, moderated by professional judgement. Table 23.5 illustrates the matrix that was used as guidance to assess the significance of potential effects.

23.3.33 It should be noted that the assessment of significance is, in practice, based on a judgement of the nature of the effect and understanding of the likely response of the ecological feature to change (i.e. its sensitivity). Assessment
therefore has to be case specific, take into account experience gained from previous assessment work (e.g. monitoring of potential change) and available scientific literature (where used the literature is cited in the relevant text). As such, the criteria presented in Table 23.5 provides a guidance framework that indicates the likely level of significance and which can then be qualified with further information where this is considered necessary or appropriate.

Table 23.5  Effect significance matrix

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Sensitivity / Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>International</td>
</tr>
<tr>
<td>High</td>
<td>Major</td>
</tr>
<tr>
<td>Medium</td>
<td>Major</td>
</tr>
<tr>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Negligible</td>
<td>Minor</td>
</tr>
</tbody>
</table>

23.3.34 In the IEEM guidance an ecologically significant impact is defined as an impact on the integrity of a defined site or ecosystem and/or conservation status of habitats or species within a given geographical area. The value of any feature that will be significantly affected is then used to identify the geographical scale at which the impact is significant. This value, therefore, relates directly to the consequences in terms of legislation, policy or development control at the appropriate level. Significant impacts on features of ecological importance should be mitigated (or compensated for) in accordance with guidance derived from policies applied at the scale relevant to the value of the feature or resource. Any significant impacts remaining after mitigation (the residual impacts), together with an assessment of the likelihood of success in mitigation, are the factors to be considered against legislation, policy and development control in determining the application.

Identification of mitigation

23.3.35 At this stage in the assessment it is possible to identify environmental measures for the scheme in order to attempt to reduce the predicted effects and result in a scheme that is less likely to result in significant adverse impacts. Proposed mitigation measures are based on experience of similar schemes and professional judgement, and are amended and augmented following the full assessment of the impacts.

23.4  Existing Environment

23.4.1 This section describes the current situation with regard to the habitats and species recorded at the proposed substation and cable corridor (including temporary works areas, the sealing end compounds and transition bays), as well as adjacent areas. It is based on both the findings of the desk study and
the habitat and species surveys undertaken. The nature conservation importance of each of the receptors is also evaluated.

**General site description**

23.4.2 The export cable landfall is just south of the Sizewell Nuclear Power Station complex and Sizewell village itself, and passes through a strip of coastal shingle / dune habitat and then landward through predominantly agricultural land. The agricultural landscape is a mix of arable and grazing pasture, with hedgerows acting as field boundaries, and occasional pockets of woodland. The substation is located to the north of Sizewell Gap, and sits partially within a small block of plantation woodland (Sizewell Wents). Sizewell Wents is also the location of the recently constructed GGOWF substation (constructed during 2009/2010). The remaining footprint of the proposed GWF substation lies within cultivated arable land and an area of grazed pasture (Broom Covert). The cable corridor between the substation and the sealing end compounds also sits partially within Sizewell Wents and partially within arable land to the east of Sizewell Wents. These areas are presented within the Phase 1 Habitat Survey shown on Figure 23.1.
Designated conservation sites

23.4.3 The proposed onshore development is not expected to result in terrestrial ecology impacts that will extend beyond 2km of the construction footprint. There are a number of statutory and non-statutory protected sites with a nature conservation interest within 2km of the proposed works footprint including:

Statutory sites

- Minsmere to Walberswick Ramsar, Special Protection Area (SPA) and Special Area of Conservation (SAC);
- Sandlings SPA;
- Leiston to Aldeburgh Site of Special Scientific Interest (SSSI);
- Sizewell Marshes SSSI; and
- Minsmere to Walberswick Heath and Marshes SSSI

Non statutory sites

- Sizewell Levels and Associated Areas County Wildlife Site (CWS);
- Southern Minsmere Levels CWS;
- Suffolk Shingle Beaches CWS;
- Leiston Common CWS;
- Dower House CWS; and
- Aldringham to Aldeburgh Disused Railway CWS.

23.4.4 The locations of these sites are shown on Figures 23.2 and 23.3. Marine conservation designations are considered within Chapter 12 Marine and Intertidal Ecology. Both onshore and offshore designated sites are also considered with Chapter 8 Designated Sites.

23.4.5 Tables 23.6 and 23.7 provide details of these sites, including reasoning for any that are scoped in/out of any further assessment.

23.4.6 A Habitats Regulations Assessment has also been undertaken as part of the development and provides further detail of the International and European sites in consideration. The Habitats Regulations Assessment screening report is included as part of this application. Information used in that assessment is provided within Tables 23.6 and 23.7.
<table>
<thead>
<tr>
<th>Reason for Designation</th>
<th>Site Description and Likelihood of Significant Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Sites:</strong></td>
<td></td>
</tr>
<tr>
<td>Minsmere to Walberswick Ramsar Site</td>
<td>The Ramsar site lies approximately 2km to the north of the proposed works footprint. Given the distance, the localised scale and nature of the likely effects associated with the works, and considering the lack of connectivity between the proposed development and the designated area, it is considered that neither the integrity of the habitats, nor the qualifying interests within the Ramsar site are likely to be affected by the works and as such, is not considered further in this assessment. No significant effects to the Ramsar site or its qualifying features are considered likely.</td>
</tr>
</tbody>
</table>

This site has been designated for the following habitats and species:

The site contains a complex mosaic of habitats, notably, areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle and driftline, woodland and areas of lowland heath. The site supports the largest continuous stand of reed in England and Wales and demonstrates the nationally rare transition in grazing marsh ditch plants from brackish to fresh water.

The combination of habitats creates an exceptional area of scientific interest supporting nationally scarce plants, British Red Data Book invertebrates and nationally important numbers of breeding and wintering birds, including:

- During the breeding season: Eurasian marsh harrier *Circus aeruginosus*, Mediterranean gull *Larus melanocephalus*, black-headed gull *Larus ridibundus* and little tern *Stern albidrons albidrons*.

- During migration (spring/autumn): great bittern *Botaurus stellaris stellaris*, Eurasian teal *Anas crecca*, ruff *Philomachus pugnax*, black-tailed godwit *Limosa limosa islandica*, spotted redshank *Tringa erythropus* and common greenshank *Tringa nebularia*.


The Ramsar designation includes the same qualifying species and habitats as the coincident Minsmere and Walberswick SPA and SAC.

Ramsar sites are considered to be of international sensitivity.
### European Sites:

<table>
<thead>
<tr>
<th>Reason for Designation</th>
<th>Site Description and Likelihood of Significant Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minsmere to Walberswick Special Protection Area (SPA)</strong></td>
<td>The SPA site lies approximately 2km to the north of the proposed works footprint. As with the Ramsar site, given the distance, the localised scale and nature of the likely effects associated with the works, and considering the lack of connectivity between the proposed development and the designated area, it is considered that neither the integrity of the habitats, nor the qualifying interests within the SPA are likely to be affected by the works and as such, is not considered further in this assessment. No significant effects to the SPA or its qualifying features are considered likely.</td>
</tr>
<tr>
<td><strong>Minsmere to Walberswick Special Area of Conservation (SAC)</strong></td>
<td>The designated area covers the same area as the Ramsar site and SPA, and is located approximately 2km to the north of the proposed works footprint. Given the distance between the works area and the SAC, the localised scale and nature of the likely effects associated with the works, and considering the lack of connectivity between the proposed development and the designated area, it is considered that the integrity of the qualifying habitats will not be affected by the works. No significant effects to either terrestrial or aquatic habitats within the SAC are likely.</td>
</tr>
<tr>
<td><strong>Sandlings Special Protection Area (SPA)</strong></td>
<td>The SPA site lies approximately 250m to the south-west of the proposed substation footprint. Given the proximity of the works from the SPA it is possible that indirect effects (i.e. disturbance to qualifying bird species) may occur during the construction phase. As described in Chapter 26: <strong>Noise</strong>, noise attenuation and ground absorption factors will quickly reduce construction and operational noise levels to negligible at that distance. As such, given that the SPA boundary is 250m away, disturbance is not anticipated to be an issue. In addition, no SPA qualifying species were recorded within the onshore development footprint during the breeding bird surveys and it is assumed they may only infrequently use the habitats on the development site for feeding or whilst on passage. No direct effects upon either the SPA habitats or the qualifying interests are anticipated. Given the distance and nature of the works, effects on the SPA are considered unlikely however given the potential for indirect effects, the site will be considered further within this assessment.</td>
</tr>
</tbody>
</table>

---

**Reason for Designation**

- **Site Description and Likelihood of Significant Effect**

  - **Minsmere to Walberswick Special Protection Area (SPA)**
    - This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:
      - During the breeding season: pied avocet, great bittern, little tern, Eurasian marsh harrier, **nightjar** Caprimulgus europaeus and **woodlark** Lullula arborea.
      - Over winter: pied avocet, great bittern and hen harrier.
    - SPAs are considered to be of international sensitivity.

  - **Minsmere to Walberswick Special Area of Conservation (SAC)**
    - This area was primarily designated due to the presence of two habitats listed on Annex 1 of the Habitats Directive: annual vegetation of drift lines and European dry heath. A further Annex 1 habitat, perennial vegetation of dry stony banks, is also present but was not a primary reason for site selection.
    - Other habitats within the SAC include coastal sand dunes, beaches, shingle, marshes, fen, heath, scrub and mixed woodland.
    - SACs are considered to be of international sensitivity.

  - **Sandlings Special Protection Area (SPA)**
    - The site covering over 3,000 hectares comprises a mosaic of habitats including acid grassland, heath, scrub, woodland (including commercial forest), fen, open water and vegetated shingle. This site qualifies under Article 4.1 of the EC Birds Directive 974/409/EEC) by supporting breeding populations of the following species listed on Annex 1 of the Directive:
      - During the breeding season: **nightjar** and **woodlark**.
    - These two species are largely associated with the large areas of open ground within the forest (cleared by storm damage in 1987 and subsequently maintained) and the areas of managed heathland.
    - SPAs are considered to be of international sensitivity.
<table>
<thead>
<tr>
<th>Reason for Designation</th>
<th>Site Description and Likelihood of Significant Effect</th>
</tr>
</thead>
</table>
| **Sizewell Marshes Site of Special Scientific Interest (SSSI)** | The SSSI lies approximately 100m to the north of the proposed substation footprint. However, the cable corridor between the substation and the sealing end compounds will be located approximately 10m from the SSSI boundary.  
  The ecological surveys undertaken did not identify any of the species associated with the SSSI within the works footprint (although the fauna may infrequently use the area for feeding/whilst on passage). Given this and the fact that there are no designated habitats (including any connected ditches) within the works footprint no direct effects are anticipated on the SSSI.  
  Given the proximity to the SSSI from the proposed works, in particular the substation footprint, it is possible that indirect effects (i.e. accidental pollution associated with surface water runoff and general disturbance to the SSSI) may occur.  
  Direct effects on the SSSI are considered unlikely however given the potential for indirect effects (surface water runoff), the site will be considered further within this assessment. |
| **Minsmere to Walberswick Heaths and Marshes Site of Special Scientific Interest (SSSI)** | The SSSI lies approximately 2km to the north of the proposed works footprint.  
  As with the Minsmere to Walberswick Special Area of Conservation SAC/SPA (which cover the same geographical area), given the distance between the development area and the SSSI, the localised scale and nature of the likely effects associated with the works, and considering the lack of connectivity between the proposed development and the designated area, it is considered that the integrity of the qualifying habitats and species will not be directly or indirectly affected by the works.  
  No significant effects to either terrestrial or aquatic habitats and species within the SSSI are likely. |
**Reason for Designation**

Leiston to Aldeburgh Site of Special Scientific Interest (SSSI)

The site forms part of the Sandlings SPA.

The SSSI contains a rich mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. This mix of habitats in juxtaposition, together with the associated transition communities between habitats, is unusual in the Suffolk Coast and Heaths Natural Area. The variety of habitats present support a diverse breeding and overwintering bird community, a high number of dragonfly species and many scarce plants.

SSSIs are considered to be of national sensitivity.

<table>
<thead>
<tr>
<th>Reason for Designation</th>
<th>Site Description and Likelihood of Significant Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leiston to Aldeburgh Site of Special Scientific Interest (SSSI)</td>
<td>The SSSI lies approximately 250m to the south-west of the proposed substation footprint. Given the proximity of the works from the SSSI it is possible that indirect effects (i.e. disturbance to qualifying bird species) may occur during the construction phase. The works will however not involve any high impact activities such as piling with typical construction plant being used. As described in Chapter 26: Noise, noise attenuation and ground absorption factors will quickly reduce construction and operational noise levels to negligible at that distance. As such given that the SSSI boundary is 250m away, disturbance is not anticipated to be an issue. In addition, no SSSI qualifying species (birds or other species) were recorded on the development site during the surveys and it is only assumed they may infrequently use the habitats on the development site for feeding or whilst on passage. No direct effects upon either the SSSI habitats or the qualifying interests are anticipated. Given the distance and nature of the works, effects on the SSSI are considered unlikely however given the potential for indirect effects, the site will be considered further within this assessment.</td>
</tr>
<tr>
<td>Reason for Designation</td>
<td>CWS Reference Number/NGR</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>Sizewell Levels and Associated Areas County Wildlife Site (CWS)</strong></td>
<td></td>
</tr>
<tr>
<td>An area of diverse habitat consisting of woodland, plantation, wet meadow, osier beds and scrub situated behind Sizewell power station which is considered to be of both regional and national importance for wildlife conservation. The site has a large diversity and abundance of the birds (including Schedule 1 species) and a number of rare and notable flora. CWSs are considered to be of regional sensitivity.</td>
<td>Suffolk Coastal 106 TM463640</td>
</tr>
<tr>
<td><strong>Southern Minsmere Levels County Wildlife Site (CWS)</strong></td>
<td></td>
</tr>
<tr>
<td>This site contains all the marshes east of Eastbridge to the sea, south of Minsmere New Cut. It abuts the internationally important Minsmere-Walberswick SSSI, which contains the Minsmere RSPB reserve. The entire valley is of great importance for wildlife forming perhaps the last unspoilt and least improved of Suffolk’s larger marshland river valleys. This eastern portion of the valley is of interest principally for breeding wader and wildfowl and for overwintering birds. The extensive area of open marsh, managed in the traditional manner with cattle grazing and high water levels provides ideal conditions for feeding birds. CWSs are considered to be of regional sensitivity.</td>
<td>Suffolk Coastal 107 TM470658</td>
</tr>
<tr>
<td><strong>Suffolk Shingle Beaches County Wildlife Site (CWS)</strong></td>
<td></td>
</tr>
<tr>
<td>The site covers all areas of shingle not currently protected under national or European designations. Vegetated shingle is a rare and decreasing habitat, both in the British Isles and in Europe. The fragile plant community which survives in the hostile maritime environment is prone to damage from intense visitor pressure. CWSs are considered to be of regional sensitivity.</td>
<td>Suffolk Coastal 4 TM3338</td>
</tr>
<tr>
<td>Reason for Designation</td>
<td>CWS Reference Number/NGR</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Leiston Common County Wildlife Site (CWS)</td>
<td>Suffolk Coastal 105</td>
</tr>
<tr>
<td>The site comprises an area of lowland heath, which is within the southern part of the British Energy Estate. The plant community features bell heather, which is uncommon in Suffolk, and a diverse lichen flora. CWSs are considered to be of regional sensitivity.</td>
<td>TM458633</td>
</tr>
<tr>
<td>Dower House County Wildlife Site (CWS)</td>
<td>Suffolk Coastal 216</td>
</tr>
<tr>
<td>Grassland on the cliff top of the Dower House is a valuable example of unimproved dry acid/dry maritime grassland. The sward composition includes species typically associated with acid grasslands and heaths such as heath violet. CWSs are considered to be of regional sensitivity.</td>
<td>TM47586514</td>
</tr>
<tr>
<td>Aldringham to Aldeburgh Disused Railway County Wildlife Site (CWS)</td>
<td>Suffolk Coastal 3</td>
</tr>
<tr>
<td>A section of disused railway line which serves as a public footpath supports a species-diverse flora both on the line of the old track and on the gently sloping embankments. CWSs are considered to be of regional sensitivity.</td>
<td>TM461619</td>
</tr>
</tbody>
</table>
**Habitats and flora**

23.4.7 The predominant habitats in the study area are arable farmland, semi-natural broadleaved and mixed woodland, plantation woodland, semi-improved grassland, open dune, dune grassland, coastal vegetated shingle, and occasional hedgerows.

23.4.8 The proposed onshore cable corridor (including transition bays and sealing compounds) is predominantly located within arable land of limited ecological interest. The cable landfall and route to the transition bays will, however, pass underneath a strip of coastal and transitional habitats that are potentially of greater ecological value. The proposed substation is located largely on arable land, but also grassland pasture of some floral interest and partly within the footprint of the Sizewell Wents woodland (an area of plantation woodland).

23.4.9 The sections below describe the habitats and flora recorded during the 2010 and 2011 surveys within the substation and cable corridor footprints. This is supplemented with information from previous surveys where required.

**Substation (and sealing end compounds) habitats**

23.4.10 The footprint of the proposed substation straddles the boundary between a sandy arable field to the south, mature pasture (Broom Covert) to the north, and mixed plantation woodland (Sizewell Wents) and scrub in the east of the site.

**Arable**

23.4.11 The arable land is cultivated and considered of low botanical interest supporting common weed species including: bugloss *Anchusa arvensis*, Canadian fleabane *Conyza canadensis*, common stork’s-bill *Erodium cicutarium*, red dead-nettle *Lamium purpureum*, field poppy *Papaver rhoeas*, annual meadow-grass *Poa annua*, black nightshade *Solanum nigrum*, and grey field speedwell *Veronica polita*. Overall this habitat is of low ecological interest and negligible ecological value.

**Pasture**

23.4.12 The area of pasture to the north (Broom Covert) is approximately 12ha in total and is currently used for grazing livestock. The grassland supports stands of nettle *Urtica dioica* over a fine sward dominated by red fescue *Festuca rubra* and common bent *Agrostis capillaris*, containing harebell *Campanula rotundifolia*, lady’s bedstraw *Galium verum*, common mouse-ear *Cerastium fontanum*, autumn hawkbit *Leontodon autumnalis*, and bulbous buttercup *Ranunculus bulbosus*.

23.4.13 Several fungi species indicative of mature pasture were present at the time of survey, these include: *Panaeolus sphinctrinus*, *Langermannia gigantea*, *Macrolepiota procera*, *Bolbitius vitellinus*, *Agaricus arvensis*, *Panaeolus foenisecii*, *Vascelum pratense*, *Coprinus nivens*, and *Stropharia coronilla*.
23.4.14 This pasture habitat is consistent with NVC SD12 (grassland derived from mildly acidic coastal sands); a habitat type that is common along coastal areas within Suffolk. The area of grassland affected by the onshore development footprint is considered to be one of the poorer examples of SD12 within Broom Covert.

23.4.15 Broom Covert is identified as lowland heath within the Sizewell Estates Land Management Plan (ADAS, 2006) with a long-term aim to be restored to heathland. However, at present this area does not support heathland or true acid grassland, and there is no active management of the site other than ongoing grazing from livestock.

23.4.16 Remnant grassland and scrub is present on the field boundaries. False oat grass *Arrhenatherum elatius* and bramble *Rubus fruticosus agg* dominate with occasional patches of red fescue, yarrow *Achillea millefolium*, and lady’s bedstraw *Galium verum*. Bracken *Pteridium aquilfolium* is dominant in places while a few bushes of gorse *Ulex europaeus* are also present.

23.4.17 At present this area of pasture is considered to be of local value.

**Woodland**

23.4.18 Sizewell Wents is a 3.5ha mixed plantation woodland comprising mature and young Scots pine *Pinus sylvestris*, sycamore *Acer pseudoplatanus*, beech *Fagus sylvatica*, and pedunculate oak *Quercus robur* with occasional sweet chestnut *Castanea sativa* and an understorey of hawthorn, elder *Sambucus nigra*, and very occasional honeysuckle *Lonicera periclymenum*. The ground flora is sparse with dense leaf litter, species include: occasional common nettle, ground-ivy *Glechoma hederacea*, red campion *Silene dioica*, and earthstar *Geastrum fimbriatum*.

23.4.19 A review of historic maps shows that Sizewell Wents was not present on the 1938 map of the area, but is shown on the 1958 map, demonstrating that this is a relatively young woodland, not of sufficient age to be deemed ‘Ancient Woodland’ (‘Ancient Woodlands’ are classified as areas that have been continuously wooded since at least 1600 and thus Sizewell Wents does not fall within this category). Sizewell Wents woodland is considered to be of relatively low ecological value and represents a habitat of local value.

**Cable corridor**

23.4.20 The majority of the onshore cable corridor between the landfall and the GWF substation, runs through arable land of similar low botanical interest to the arable land described previously. A section (approximately 380m in length) of the cable corridor running between the substation and the sealing end compounds also passes through the aforementioned Sizewell Wents woodland. Other habitats located along the cable corridor are described in the following paragraphs.
Shingle / dune

23.4.21 The beach area consists of two fixed sand dune ridges and a vegetated shingle ridge above MHWS. Below MHWS the beach consists of barren shingle and sand (habitats below the high tide mark are dealt with separately in Chapter 12: Marine and Intertidal Ecology).

23.4.22 The oldest, most inland dune ridge is dominated by bracken and scrub consisting of gorse, bramble, blackthorn, and honeysuckle. Open areas in the scrub are dominated by sea couch grass *Elytrigia atherica*. Herbs of note include native bluebell *Hyacinthoides non-scripta*¹ and sticky groundsel *Senecio viscosus*.

23.4.23 Seaward of this ridge is the second fixed dune ridge comprising an area of dune grassland, largely short grazed by rabbits, and dominated by fine grasses such as red fescue, sheep’s fescue *Festuca ovina*, and sweet vernal-grass *Anthoxanthum odoratum*. Mosses (primarily *Polytrichum juniperinum*, *Dicranum scoparium* and *Syntrichia ruralis ssp ruraliformis*) and the lichen *Cladonia furcata* are frequent in this zone.

23.4.24 Other flowering plant species include, sheep’s-bit *Jasione montana*, sand sedge *Carex arenaria*, common stork’s-bill *Erodium cicutarium*, sticky stork’s-bill *Erodium lebelii*, cat’s-ear *Hypecoheris radicata*, lesser hawkbit *Leontodon saxatilis*, field woodrush *Luzula campestris*, mouse-ear hawkweed *Pilosella officinarum*, and lady’s bedstraw *Galium verum*. Areas of taller grassland on the dune are dominated by marram grass *Ammophila arenaria*. Hound’s-tongue *Cynoglossum officinale* is also frequent in this habitat. Coastal sand dunes (both fixed and mobile in nature) are listed as a Suffolk and UK BAP priority habitat and recognised as a Habitat of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006.

23.4.25 Seaward of the fixed ridges is a more dynamic shingle ridge vegetated by patches of forbs and occasional clumps of marram grass. Sea beet *Beta vulgaris ssp. maritima*, yellow horned poppy *Glaucum flavum* (a nationally rare species), sea sandwort *Honkenya peploides*, and creeping restharrow *Ononis repens* are abundant. Other noteworthy plant species present in this zone on adjoining areas of the beach include sea pea *Lathyrus japonicus* and sea holly *Eryngium maritimum*. Sea kale *Crambe maritima* occurs abundantly in this zone right up to the high tide mark. Coastal vegetated shingle is listed as a Suffolk and UK BAP priority habitat and recognised as a Habitat of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006.

23.4.26 Given that these habitats could potentially qualify as a Suffolk BAP and UK BAP habitats, this area of shingle and dune is considered to be of national value.

¹ Protected under Schedule 8 of the Wildlife and Countryside Act (1981) making it an offence to collect (pick, uproot or destroy) them in the wild
Hedgerows

23.4.27 This cable corridor crosses five lengths of hedgerows – two either side of Sizewell Hall access road, two either side of Sizewell Gap and one along the southern boundary of Broom Covert. These are species-poor hedgerows, dominated by hawthorn, with occasional blackthorn and bramble. None of the hedges present meet the criteria for importance set out in the Hedgerow Regulations Act 1997. The hedgerows are considered to be of local ecological value.

Summary

23.4.28 Table 23.8 provides a summary of the habitat values identified.

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Habitat value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shingle / dune</td>
<td>National</td>
</tr>
<tr>
<td>Pasture</td>
<td>Local</td>
</tr>
<tr>
<td>Woodland</td>
<td>Local</td>
</tr>
<tr>
<td>Hedgerow</td>
<td>Local</td>
</tr>
<tr>
<td>Arable land</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Reptiles

23.4.29 All four common reptile species found in the UK, namely: common or viviparous lizard *Zootoca vivipara*, adder *Vipera berus*, grass snake *Natrix natrix*, and slow worm *Anguis fragilis* were recorded during the course of the 2006, 2007, 2010 and 2011 surveys. Figure 23.4 shows the spatial extent of these surveys and the survey results are presented in Tables 23.9 to 23.11.

23.4.30 Reptile surveys undertaken in 2006 and 2007, focussed on the woodland habitat and fringes associated with Sizewell Wents (woodland interior and woodland edges) and Sandy Lane to the east, and concluded that the woodland interior was not suitable reptile habitat given the dense shade and lack of suitable cover (ESL, 2007a). It was established that the woodland edge habitat and other boundary features, such as hedge-lined paths did support populations of reptiles. This was confirmed during a reptile translocation exercise in 2007, undertaken ahead of the ground clearance works for the GGOWF substation when all reptile captures occurred at the edges of the woodland, with no captures within the woodland interior.

23.4.31 The 2010 reptile surveys considered the dune and beach areas and along the cable corridor (on land to the south of Sizewell Gap). Significant reptile populations were recorded within the dunes and along hedgerows within these areas. Given the large expanses of arable and tightly grazed pasture in the wider area, it is likely that linear features such as hedgerows are
important routes for migration, dispersal and connectivity between summer and winter habitats for reptile species.

23.4.32 The 2011 reptile surveys considered the substation footprint itself (land to the north of Sizewell Gap was not accessible during the 2010 surveys). These surveys again confirmed that the woodland edge habitats still support populations of reptiles with an absence of reptiles in the woodland interior. No reptiles were recorded within Broom Covert during the 2011 surveys. This area is considered to be sub-optimal reptile habitat given the current grazing activities, short and uniform sward and the lack of cover for reptiles.

23.4.33 The 2011 survey extent also considered an area immediately west of Sandy Lane, which has been proposed as a potential reptile translocation site. The results of the 2011 survey indicate that this recently planted landscape mitigation area does not currently support reptiles.
23.4.34 The peak count of each species during the 2010 and 2011 surveys is shown in Tables 23.9 to 23.11. A population assessment based on Froglife (1999) guidance is also provided. The following results are presented based on reptile populations recorded within the working footprints of the:

- Cable landfall (dune and beach habitats);
- Cable corridor (inland of the dunes); and
- GWF substation.

Table 23.9 Results of surveys within the cable landfall (dune and beach habitats) footprint (2010)

<table>
<thead>
<tr>
<th>Habitats present</th>
<th>Area</th>
<th>Reptile species</th>
<th>Peak count</th>
<th>Population assessment</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dune / shingle 2ha</td>
<td>Adder 2</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Common lizard 3</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slow worm 3</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total score</strong></td>
<td></td>
<td><strong>3</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

23.4.35 The dune / shingle habitats at the cable landfall would qualify as a Key Reptile Site based on three or more reptile species being present (Froglife, 1999).

Table 23.10 Results of surveys within the cable corridor footprint (2010)

<table>
<thead>
<tr>
<th>Habitats present</th>
<th>Area</th>
<th>Reptile species</th>
<th>Peak count</th>
<th>Population assessment</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arable 4.4ha</td>
<td>Absent n/a</td>
<td>n/a</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedgerow 0.1ha (160m in length)</td>
<td>Adder 1</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Common lizard 1</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slow worm 1</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total score</strong></td>
<td></td>
<td><strong>3</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

23.4.36 The hedgerows associated with the cable corridor would qualify as a Key Reptile Site based on three or more reptile species being present (Froglife, 1999).

Table 23.11 Results of surveys within the GWF substation footprint (2011)

<table>
<thead>
<tr>
<th>Habitats present</th>
<th>Area</th>
<th>Reptile species</th>
<th>Peak count</th>
<th>Population assessment</th>
<th>Score</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Arable</th>
<th>15.2ha</th>
<th>Absent</th>
<th>n/a</th>
<th>n/a</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open grassland</td>
<td>2.4ha</td>
<td>Absent</td>
<td>n/a</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>Woodland interior</td>
<td>1.7ha</td>
<td>Absent</td>
<td>n/a</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>Woodland edge / hedgerow</td>
<td>0.65ha</td>
<td>Adder</td>
<td>1</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>Common lizard</td>
<td>10</td>
<td>Good</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow worm</td>
<td>4</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass snake</td>
<td>3</td>
<td>Low</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total score</strong></td>
<td><strong>5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

23.4.37 The woodland edge and hedgerow associated with the GWF substation would qualify as a Key Reptile Site based on three or more reptile species being present, two snake species being present, and that it has an overall score of at least four points (Froglife, 1999).

23.4.38 Reptiles are not present within the majority of the proposed onshore development footprint, being completely absent from arable, woodland interior and grassland habitats. The total onshore development footprint covers an area of approximately 29ha; however, only small areas within this support reptiles, namely 2ha of dune/shingle, 160m of hedgerows along the cable corridor (two hedgerows lining Sizewell Hall road), and 0.65ha of woodland edge/hedgerow habitat within the substation footprint.

23.4.39 Whilst the populations of reptiles located within the onshore development footprint are typically low, all four species have been recorded, with all four reptile species present within the substation footprint.

23.4.40 All common reptiles are priority UK Biodiversity Action Plan (UK BAP) species and Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006 on account of their recent decline in numbers across the UK.

**Reptile legislation**

23.4.41 All four common reptile species found on the site are afforded partial protection under the Wildlife & Countryside Act 1981 (as amended) making it an offence to:

- Intentionally kill or injure any reptiles; and
- Trade any reptiles (i.e. sell, barter, exchange, transport for sale, and advertise to sell, or to buy).
23.4.42 There are provisions in the legislation to allow actions to take place under licence, which would otherwise contravene the law.

Summary

23.4.43 Reptiles are not present within much of the onshore development footprint, and where they are present numbers are typically low. However, all four common reptile species have been recorded within the onshore development footprint. Thus it is considered that reptile populations found on the site should be regarded as being of county value.

Bats

Bat roost potential

23.4.44 No buildings are present within the proposed onshore development footprint. The trees within Sizewell Wents are generally young and small comprising pine, beech, sweet chestnut and sycamore.

23.4.45 Sizewell Wents woodland was assessed for its potential to support roosting bats in 2006, 2007 and 2011. The 2006 and 2007 surveys concluded that there were no active bat roosts inside Sizewell Wents, and no features with the potential to support bat roosts during the 2006 and 2007 survey (ESL, 2006 and 2007b).

23.4.46 During the 2011 survey 11 trees were identified with bat potential and three bat roosts were confirmed in two of these trees. The trees only appeared to support singletons of common pipistrelle *Pipistrellus pipistrellus* and one noctule *Nyctalus noctula*. No other roosts were identified and there was no evidence (e.g. droppings and urine staining) to suggest the presence of a maternity roost. Given the transient nature of bats it is likely these trees are only used on an occasional basis. The location of these trees with bat roost potential and the location of the bat roosts are shown on Figure 23.5 and details provided in Table 23.12.

<table>
<thead>
<tr>
<th>Tree no.</th>
<th>Species</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pinus sp</td>
<td>Dead with woodpecker hold at 6m on western aspect. Low bat roost potential.</td>
</tr>
<tr>
<td>2</td>
<td>Beech</td>
<td>Dead bough at 4m on northern aspect. Pipistrelle roost present (single individual). Confirmed roost.</td>
</tr>
<tr>
<td>3</td>
<td>Beech</td>
<td>Two fissures at 4m on northern aspect. Noctule and pipistrelle roosts present (single individuals in each roost). Confirmed roosts.</td>
</tr>
<tr>
<td>4</td>
<td>Sycamore</td>
<td>Woodpecker hole at 5m on southern aspect. Moderate bat roost potential.</td>
</tr>
<tr>
<td>5</td>
<td>Hawthorn</td>
<td>Split bough at 1.5m on eastern aspect. Low bat</td>
</tr>
</tbody>
</table>
Bat activity surveys were also undertaken in 2006, 2007 and 2011. During the 2006 and 2007 surveys six species of bat were recorded in the onshore development footprint including common pipistrelle soprano pipistrelle *Pipistrellus pygmaeus*, serotine *Eptesicus serotinus*, brown long-eared *Plecotus auritus*, noctule and one recording of Nathusius’ pipistrelle *Pipistrellus nathusii*.

During the 2011 walked transects four species of bats were recorded. Common pipistrelle and soprano pipistrelle were recorded during each survey with common pipistrelle the most frequently detected. In addition, a single noctule pass and a single barbastelle *Barbastella barbastellus* pass were recorded during the second transect both of which were over 90 minutes after sunset indicating that these individuals were likely to be commuting over the site and not roosting nearby.
23.4.49 The majority of activity appeared to be associated with the woodland area in the north-west of the site. On both occasions, bats were observed foraging in this area throughout the duration of the survey. No repeatedly used flight paths of any species were noted.

23.4.50 During the 2011 remote recording (across six full survey nights) ten bat species were recorded. Over half of these calls were identified as common pipistrelle whilst approximately a quarter were soprano pipistrelle calls. The species recorded are given in Table 23.13.

<table>
<thead>
<tr>
<th>Bat species recorded</th>
<th>Percentage of total calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common pipistrelle</td>
<td>55.2</td>
</tr>
<tr>
<td>Soprano pipistrelle</td>
<td>22.7</td>
</tr>
<tr>
<td>Brown long-eared</td>
<td>4.4</td>
</tr>
<tr>
<td>Pipistrelle sp</td>
<td>3.8</td>
</tr>
<tr>
<td>Noctule</td>
<td>3.6</td>
</tr>
<tr>
<td>Serotine</td>
<td>3.3</td>
</tr>
<tr>
<td><em>Myotis</em> spp (including Natterer’s)</td>
<td>2.1</td>
</tr>
<tr>
<td>Barbastelle</td>
<td>1.5</td>
</tr>
<tr>
<td>Nathusius’ pipistrelle</td>
<td>0.9</td>
</tr>
<tr>
<td>Leisler’s</td>
<td>0.3</td>
</tr>
<tr>
<td>Unidentified</td>
<td>2.2</td>
</tr>
</tbody>
</table>

23.4.51 The time after sunset at which each species was first detected varied across the survey period though calls of common and soprano pipistrelle, noctule and brown long-eared were all, on at least one night, detected within their published emergence times (Bat Conservation Trust, 2007). Despite this, no species were recorded consistently or early enough to indicate the presence of a roost within or immediately adjacent to the site.

23.4.52 All other species detected during the survey period were recorded later than their typical emergence times and were only detected occasionally suggesting that these records were of transient individuals using or flying over the site infrequently.

23.4.53 The majority of activity (commuting and foraging) was noted along linear hedgerow features and around Sizewell Wents.

23.4.54 The wider Sizewell Estate is known to support at least ten species of bats (Entec, 2011a); these are the aforementioned species plus Natterer’s *Myotis nattereri*, Daubenton’s *Myotis daubentonii* and Leisler’s *Nyctalus laeisleri*. The wider Sizewell Estate offers a good mix of natural and semi natural habitats including large connected blocks of woodland (e.g. Kenton and...
Goose Hills), heathland and marshland. This wider area offers optimal conditions for foraging, commuting and roosting for bat species.

23.4.55 Whilst the habitats within the onshore development footprint include the Sizewell Wents block of woodland and some lengths of interrupted hedgerow, these areas are fragmented and lack connectivity with the wider habitats within the Sizewell Estate. The most recent surveys undertaken for the Sizewell Estate demonstrate that bat activity levels are significantly lower (or in some cases absent) in the open arable and wetland habitats in comparison to the activity in Kenton and Goose Hills to the north (Entec, 2011a). This limited activity further highlights the lack of connective habitat between the optimal areas in the wider Sizewell Estate and the habitats on the GWF site.

23.4.56 Based on the data gathered to date, the site is considered to be of value for foraging and commuting for up to ten species of bat. The site is currently likely to provide suitable foraging habitat for common species, particularly pipistrelles, as well as providing linkage between potential roost sites and/or foraging grounds for common and less frequently recorded species.

Bat legislation

23.4.57 All bats in the UK are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Habitats Regulations, making it illegal to:

- Intentionally or deliberately kill, injure or capture (take) bats;
- Deliberately disturb bats (whether at roost or not);
- Recklessly disturb roosting bats or obstruct access to their roosts;
- Damage or destroy bat roosts;
- Possess or transport a bat or any part unless acquired legally; or
- Sell (or offer for sale) or exchange bats, or any parts of bats.

23.4.58 There are provisions in the legislation to allow actions to take place under licence, which would otherwise contravene the law. All bats are European Protected Species (EPS), and therefore any activity which is likely to result in an offence under the Habitats Regulations, will require an EPS licence. These licences can be obtained from Natural England.
Summary

23.4.59 Three bat roosts, supporting single bats only, were recorded within Sizewell Wents during the 2011 survey, and their extensive presence in the wider Sizewell Estate has been confirmed. Bats represent a receptor of national value.

Breeding birds

23.4.60 Suitable nesting habitat exists in the footprint of the land based works including areas of rough grassland, scrub, arable farmland, hedgerows, and shingle.

23.4.61 Breeding bird surveys were carried out in 2005 and 2006 over a wide study area including the beach at Sizewell, part of Sizewell Marshes SSSI to the north of the proposed development, woodland between Sandy Lane, beach to the east, and agricultural land to the south and west. The extent of both of these surveys is shown on Figure 23.6. The study areas differ slightly between the two years; however, both study areas include the GWF onshore development footprint.

23.4.62 These studies indicated that several species of conservation importance were present. In total, 64 species (with recorded evidence of breeding) were recorded in the 2005 surveys and 71 species in the spring 2006 surveys. Many of the recorded species were within or close to the proposed works footprint, including grey heron *Ardea cinerea*, sparrowhawk *Accipiter nisus*, yellowhammer *Emberiza citrinella*, and skylark *Alauda arvensis* (the latter two species are included on the Birds of Conservation Concern Red List (high conservation concern) with skylark also being listed on the UKBAP). No species associated with the nearby Sizewell Marshes SSSI and Sandlings SPA were recorded in the study areas in either year.

23.4.63 A further breeding bird check was conducted within Sizewell Wents, in February 2008 prior to the construction of the GGOWF onshore substation. Evidence of birds commencing breeding activity was recorded during this visit.

23.4.64 The recorded species included: grey partridge *Perdix perdix* (listed on the Suffolk BAP); grey heron; great spotted woodpecker *Dendrocopos major*; skylark; pied wagtail *Motacilla alba*; wren *Troglodytes troglodytes*; dunnock *Prunella modularis*; song thrush *Turdus philomelos* (listed on the UK BAP and included on the Birds of Conservation Concern Red List (high conservation concern)), fieldfare *Turdus pilaris*; gold crest *Regulus regulus* (included on the Birds of Conservation Concern Amber List (medium conservation concern)), and long-tailed tit *Aegithalos caudatus*. No birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded during these surveys.
23.4.65 Surveys were also undertaken in the wider Sizewell Estate in 2007 (not including habitats to the south of Sizewell Gap Road) and reported similar findings with 69 species recorded with breeding activity (Entec, 2008a). Again these were mainly common or widespread species. No qualifying species associated with the Sizewell Marshes SSSI, Sandlings SPA or more distant Minsmere to Walberswick SPA were recorded breeding, foraging or commuting during the surveys in the wider estate. Breeding shovelor Anas clypeata, teal Anas crecca, gadwall Anas strepera and woodlark Lullula arborea were recorded within the Sizewell Estate foraging within the marshes (Entec, 2008a), i.e. away from the GWF onshore development footprint.

23.4.66 Specific surveys for the wider Sizewell Estate undertaken in 2008 for two of the key species associated with the SSSI and nearby SPAs, namely bittern Botaurus stellaris and marsh harrier Circus aeruginosus (Entec, 2008b; Entec, 2008c) show that both species do not utilise the GWF footprint. Bittern were shown to stay within or close to the SPA and did not utilise Sizewell Marshes (the bitterns prefer the larger reedbeds associated with the SPA). Marsh harrier are present in good numbers in Sizewell Marshes.

23.4.67 Surveys undertaken in 2010 in the Sizewell Estate for little tern Sterna albifrons, a qualifying species of the SPA show that breeding and foraging activity is focussed on the SPA habitats, approximately 2km north of the GWF site (Entec, 2011b). Some foraging activity extends along the shoreline between Sizewell and Thorpeness (no activity noted in the GWF footprint) but these are not considered important hunting grounds for the species (Entec, 2011b).

23.4.68 The presence of the grey heron nesting along the eastern side of Sizewell Wents (observed during the 2006 and 2008 surveys) is of interest as few other nesting sites are present in the immediate area of the Suffolk coast. In addition black redstart (Phoenicurus ochruros) are also known to be present on the Sizewell nuclear power station site (RSPB pers comm., 2011).

**Bird legislation**

23.4.69 All wild bird species in the UK are protected under the Wildlife and Countryside Act 1981. It is an offence to:

- Damage or destroy wild bird eggs/nests; or
- Kill/injure/take any wild birds.

23.4.70 Schedule 1 of the Act contains a list of bird species for which all offences carry harsher penalties and for which extra protection makes it an offence to:

- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.
Summary

23.4.71 Overall breeding birds within the GWF footprint represent a receptor of local value.

Water vole and otter

23.4.72 Surveys undertaken in 2006 (ESL, 2006) and 2010 (Entec, 2011c) confirmed the presence of water vole *Arvicola amphibius* and otter *Lutra lutra* in Sizewell Marshes SSSI. No signs of water vole or otter were recorded in the GGOWF works footprint, and adjacent areas, during any of the ecological surveys undertaken in 2006 or 2007.

23.4.73 The habitats within the GWF works footprint are a mix of woodland and arable fields (i.e. no water bodies) and, therefore, not considered suitable for water vole populations or feeding otters. The GWF footprint is considered too far from any water bodies to be suitable as potential habitat for an otter holt.

23.4.74 Given their known existence in the wider area, and the large roaming distances exhibited by the species, it is accepted that the area may be used infrequently by otters on passage between water bodies.

Otter legislation

23.4.75 Otters receive protection under both the Wildlife and Countryside Act (1981) (as amended) and the Habitats Regulations. Otters and their resting places are fully protected making it an offence to:

- Deliberately capture, injure or kill an otter;
- Damage, destroy or obstruct their breeding or resting places; or
- Disturb otters in their breeding or resting places.

23.4.76 There are provisions in the legislation to allow actions to take place under licence, which would otherwise contravene the law.

Summary

23.4.77 The study area is considered of local importance for otter on passage between water bodies, but is not considered suitable to support water voles.
Badger

23.4.78 During the 2010 and 2011 surveys no evidence of recent badger activity was found to the north of Sizewell Gap other than a disused sett.

23.4.79 These findings are also mirrored by ecological surveys within Sizewell Estate (Entec, 2011e) where no setts were recorded in the footprint of the GWF substation. These surveys also showed extensive foraging activity in the wider area but no activity in the surveyed footprint of GWF.

Badger legislation

23.4.80 Badgers are protected under the Protection of Badgers Act (1992) and are also listed on Schedule 6 of the Wildlife and Countryside Act (1981). Under the provisions of the 1992 Act, Section 3 (interfering with a badger sett), it is a criminal offence in most circumstances to:

- Damage a badger sett or part of it;
- Destroy a badger sett;
- Obstruct access to, or any entrance of, a badger sett;
- Cause a dog to enter a badger sett;
- Disturb a badger when it is occupying a badger sett; and
- Intend to do any of these things or be reckless as to whether any actions would have any of those consequences.

23.4.81 There are provisions in the legislation to allow actions to take place under licence (which would otherwise contravene the law).

Summary

23.4.82 The study area is considered to be of local importance for badgers.

Great crested newts and other amphibians

23.4.83 A desk study and consultation with local groups concluded that there were no records of great crested newt *Triturus cristatus* in the immediate area (CMACS, 2005; ESL, 2006). A more recent search by the Suffolk Biological Records Centre in 2010 also revealed no evidence of the species in the immediate area. The nearest and most recent records were noted at ponds in Leiston (TM 445 624) in 1998, approximately 2.1km west of the proposed works. It is understood that the presence of great crested newt in the area closely matches the distribution of the underlying clay geology with few records within the Sandlings coastal area. This is illustrated in Figure 23.6 taken from the Suffolk Amphibian and Reptile Atlas (Baker *et al*, 2007).
Figure 23.7  Records of Great Crested Newt in Suffolk

Source - Suffolk Amphibian and Reptile Atlas Provisional (Baker et al., 2007)

23.4.84 A single-visit survey for great crested newts was carried out by Suffolk Wildlife Trust in May-June 2005. No great crested newts or their eggs were found.

23.4.85 A presence / absence survey was undertaken in 2006 for water bodies within 500m of the study area (two ponds to the south of Sizewell Gap and a network of drains to the north of the woodland in the Sizewell Marshes SSSI), see Figure 24.1. No great crested newts were found during this survey. The survey concluded that the area was not of value for great crested newt, due to the water bodies location outside of the known local distribution, and as a result of large numbers of fish and predatory invertebrates within the ponds surveyed.

23.4.86 A breeding population of smooth newts *Lissotriton vulgaris* was found in a pond associated with Home Farm and a smooth newt was identified within the drains associated with Sizewell Marshes SSSI. Common frogs *Rana temporaria* and common toads *Bufo bufo* were also recorded in Sizewell Marshes SSSI. Common toad is now listed on the UK and Suffolk BAP as a priority species.

23.4.87 As no evidence was found of great crested newts using the water bodies within 500m of the site, it is reasonable to assume that the terrestrial habitats, such as the Sizewell Wents woodland, are not used by this species. Overall it is assumed that the species is likely to be absent and is not considered further in this assessment.
Summary

23.4.88 The study area is considered to be of no value to great crested newt. The wider area does support common species of amphibian including smooth newt, common toad, and common frog. Given that the majority of the development footprint is comprised of arable land (sub-optimal habitat for amphibian species) the onshore development footprint is considered to be of negligible value for amphibians.

Invertebrates

23.4.89 The desk study in 2005 (CMACS, 2005) identified a number of notable terrestrial and freshwater invertebrates, associated with the Sizewell Marshes SSSI, heathland habitats in the Suffolk Sandlings, and the coastal beach and dune system. Species of note included the nationally rare ant lions *Euroleon nostras* (a Suffolk BAP species), the nationally uncommon diving beetle *Suphrodytes dorsalis*, and the snail *Bithynia leachii*.

23.4.90 Recent terrestrial invertebrate surveys of Sizewell Marshes SSSI show that it supports three UK BAP, seven Red Data Book and twelve Nationally Scarce terrestrial invertebrate species (Entec, 2011d). The main interest on site for invertebrate species is the grazing marsh ditches and reedbeds (Entec, 2011d).

23.4.91 No aquatic habitat is present within the works footprint, nor any habitat suitable for the specialist invertebrates associated with the adjacent SSSI. As such, aquatic invertebrates are not considered further in this assessment.

23.4.92 The majority of the work will be undertaken on agricultural land which is considered to be of limited value for terrestrial invertebrates. However, the semi natural habitats in the remaining works areas such as the foreshore, woodland edges, hedgerows and the area of pasture are likely to support a more diverse terrestrial invertebrate assemblage.

23.4.93 Sizewell Marshes SSSI is noted for its wide range of invertebrate taxa, including many rare and scarce aquatic species; however, none of these habitat types are present within the onshore development footprint.

23.4.94 There are some limited areas of potentially suitable semi-natural terrestrial habitat within the works footprint, thus the area is considered of local value for terrestrial invertebrates.
Other notable species of conservation importance

23.4.95 Biological records and sightings during surveys indicate the presence of a number of other notable species in the study area including hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, and water shrew *Neomys fodiens* (all listed within the Suffolk and UK BAP and adopted as species of Principal Importance in England under Section 41 of the NERC Act 2006). No other BAP or NERC species were recorded during the surveys.

23.4.96 Given these listings the area is regarded as of local value for these species.

23.5 **Assessment of Impacts - Worst Case Definition**

23.5.1 Within the onshore development footprint appreciable flexibility is only permitted within the GWF compound, transmission compound and onshore cable corridor. Flexibility within the two compounds applies to equipment / building location and the finished floor level. Since this assessment considers the impact of the entire footprint of both compounds this flexibility is not relevant to the terrestrial ecology assessment. Flexibility within the cable corridor permits the permanent works to lie within a defined overall extent of the temporary works. Since this assessment considers the impact of the entire temporary works, and there is no distinction between that temporary or permanent nature, this flexibility is not relevant to this assessment.

23.5.2 Full details on the range of flexibility being considered by GWFL are provided in *Chapter 5 Project Details*. For the purpose of this assessment the proposed onshore development footprint is as presented in *Figure 1.3*.

23.6 **Assessment of Impacts during Construction**

**Physical damage to designated sites**

23.6.1 As detailed in *Tables 24.6* and *24.7*, the only statutory and non-statutory sites where there are potential adverse effects associated with the proposed works are Sizewell Marshes SSSI and the Suffolk Shingle Beaches CWS. The key qualifying interest of the Sizewell Marshes SSSI is the large area of lowland unimproved wet meadows and associated invertebrate, bird and plant assemblages. The Suffolk Shingle Beaches CWS is designated for rare shingle habitats and flora. These sites are assessed in turn in the following paragraphs.

*Sizewell Marshes SSSI*

23.6.2 The SSSI is located approximately 100m to the north of the substation footprint, and 10m to the north of the transmission cable corridor at its nearest point, and will not result in any direct habitat losses. No direct damage to habitats associated with Sizewell Marshes SSSI is anticipated.
23.6.3 Indirect damage of sensitive water dependent habitats associated with Sizewell Marshes could potentially result from pollution as a result of accidental spillage from construction plant (moving via surface or groundwater pathways).

23.6.4 There are no known direct surface hydrological links (i.e. drainage channels) between the proposed development footprint and the SSSI. The study area is underlain by a principal and secondary aquifer; however, these are located over 100m below the ground and the potential for pollutants to migrate via groundwater pathways is considered highly unlikely (refer to Chapter 22: Geology, Hydrogeology, Land Quality and Flood Risk). Given the low potential for pollution events this represents an effect of low magnitude.

23.6.5 Given that Sizewell Marshes SSSI is considered to be of national sensitivity a minor adverse impact is anticipated on the integrity of these sites in the absence of mitigation.

*Suffolk Shingle Beaches CWS*

23.6.6 Without mitigation, there is the potential for direct damage to the Suffolk Shingle Beaches CWS, located directly within the cable corridor footprint where temporary activities are required to support the installation of subsea sea export cables as they are brought into the directional drilling reception pits. Access to the directional drilling reception pits, located below MHWS, will require vehicular access across the dune and shingle habitats (for example 20 tonne tracked 360 degree excavators and 4x4 vehicles). The existing informal tracks through the dunes support sensitive dune and shingle plant communities, were reported to be damaged as a result of vehicular access during the construction of GGOWF. Without mitigation, similar damage to these dune and shingle communities may be expected during the construction of GWF.

23.6.7 Other beach works with the potential for impacts include the use of beach anchors associated with the offshore cable laying vessel. This will result in very localised temporary disturbance of the shingle in the area of the beach anchors, during the cable laying activity.

23.6.8 Although the CWS is a non-statutory designation, these transitional shingle habitats are rare in Suffolk and represent a receptor of regional sensitivity. Damage associated with vehicular access to the foreshore, although temporary, would represent an impact of high magnitude and therefore a moderate adverse impact is anticipated in the absence of mitigation.

23.6.9 No excavation of vegetated shingle is proposed as part of the GWF construction. The directional drilling reception pit will require some excavation of the barren shingle located below MHWS. Impacts below MHWS (such as cable landfall and the excavation of the directional drilling reception pit) are considered separately within Chapter 12 Marine and Intertidal Ecology. Directional drilling techniques will ensure that the cable
laying exercise itself will avoid all of the shingle and dune habitats above MHWS.

Mitigation and residual impacts

23.6.10 A range of mitigation measures will be employed during the construction phase of the development and will include the following:

- A Construction Code of Practice (CCoP) (including detailed working plans) for works in or near designated habitats will be developed in consultation with Natural England;

- The CCoP will comply with the recommendations of the Environment Agency PPGs. In particular, attention will be drawn to:
  - PPG 1: General guide to the prevention of water pollution;
  - PPG 5: Works in, near or liable to affect watercourses;
  - PPG 6: Working at construction and demolition sites; and
  - PPG 21: Pollution incident response planning.

- To minimise the risk of accidental pollution incidents the construction method statements will include a Pollution Incident Response Plan in line with PPG21. This will include mechanisms to control surface water run-off from the site and pollution prevention and response planning. Further detail on these measures are outlined in Chapter 22: Geology, Hydrogeology, Land Quality and Flood Risk.

- Directional drilling methods will be employed to avoid all shingle and dune habitats above MHWS, thereby avoiding the qualifying features associated with the Suffolk Shingle Beaches CWS;

- The directional drilling reception pit footprint (below MHWS) will be minimised to avoid unnecessary excavation of the barren shingle;

- During excavation works, at the directional drilling reception pit, discrete layers, i.e. shingle and sand will be segregated and stored separately and replaced in the same sequence to retain the structural integrity of the shingle matrix and minimise post-construction wash out of shingle;

- Any stock piled shingle will be placed away from any adjacent sensitive habitats under the supervision of an Environmental Clerk of Works (ECW);

- Where access is required across the dune habitats (to the directional drilling reception pit) temporary gridded matting, or similar, will be placed along all such access routes to minimise disturbance from vehicles;

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2 This must not be considered a definitive list; copies of these and other guidelines can be found on the Environment Agency website.
• Works will be supervised by an ECW and liaison with the key stakeholder will be maintained throughout the construction phase; and
• Areas temporarily affected by works will be restored to at least their original condition through planting, smoothing of tracks, and/or natural regeneration.

23.6.11 Following the implementation of the outlined mitigation the magnitude of the potential impact to Sizewell Marshes SSSI will be reduced to negligible and damage to Suffolk Shingle Beaches CWS will be reduced to low. As such, a negligible residual impact is anticipated for both Sizewell Marshes SSSI and Suffolk Shingle Beaches CWS.

Indirect disturbance to designated sites

23.6.12 The proximity of the works to Sandlings SPA, Leiston and Aldeburgh SSSI and Sizewell Marshes SSSI could result in short-term noise disturbance to birds listed as qualifying species for those sites. Noise disturbance will be associated with general site activities (vehicles travelling to and from site and machinery in operation) and also some short-term high level disturbance activities such as piling at the substation site. In addition, air quality impacts could affect sensitive habitats adjacent to the works.

Increased noise associated with vehicular access to the GWF site

23.6.13 The main construction access route to the site is Sizewell Gap, which is adjacent to the northern most boundary of Sandlings SPA and Leiston and Aldeburgh SSSI. This route currently receives a significant level of traffic largely associated with Sizewell A and B power stations. The entrance to the GWF development site is approximately 250m from Sandlings SPA and Leiston to Aldeburgh SSSI. As stated in Chapter 25 Traffic and Transport, the average number of Heavy Goods Vehicle (HGV) movements during the substation build will be approximately 2.5 movements per hour. During the AM peak (07.30 to 08.30) traffic vehicle numbers are predicted to increase from 436 to 493 during the GWF construction – an increase of 57 vehicle movements (13%) compared to present day numbers. As reported within Chapter 25, increases in traffic below 25% are considered to be imperceptible with regards to increased noise. The potential for increased noise disturbance associated with this marginal rise in traffic, on the species associated with these designated sites, is considered to be negligible.

Construction noise

23.6.14 Sandlings SPA and Leiston and Aldeburgh SSSI are both in excess of 250m from the substation site. As described in Chapter 26 Noise, noise attenuation and ground absorption factors are expected to reduce construction noise (including piling) at this distance to a negligible impact.

23.6.15 Sizewell Marshes is located approximately 100m to the north of the proposed substation site and approximately 10m north of the proposed cable route at
its nearest point. As reported within Chapter 26 construction noise (including piling) is expected to increase above baseline noise levels but remain below 65dB which is the accepted noise threshold for construction noise in a rural location. This increase in noise could still represent a temporary disturbance for birds and could result in some short-term displacement of birds closest to the works.

23.6.16 The potential effects of disturbance during construction work are in most instances short-term; however, any disturbance to nesting birds as a result of construction activities would represent an impact of high magnitude. Given that the study area is considered to be of local sensitivity for breeding birds a temporary minor adverse impact is anticipated in the absence of mitigation.

**Mitigation and residual impacts**

23.6.17 A range of mitigation measures will be employed during the construction phase of the development. These will include those listed in Section 23.6.9 and in addition will include the following:

- Best practice noise control and management techniques will be employed as detailed within Section 26.6; and
- Works will be supervised by an ECW and liaison with the key stakeholders maintained throughout construction.

23.6.18 Implementation of the noise control measures outlined in Chapter 26 will ensure that construction related noise is maintained below the accepted 65dB threshold. However, there will still be the potential for the short-term displacement of birds closest to the works. As such minor adverse residual impact remains.

**Dust deposition**

23.6.19 The proposed onshore development has the potential for construction dust to affect nearby receptors. Chapter 27 Air Quality reports that the transient nature of the construction phase would lead to localised, temporary minor adverse air quality impacts with respect to dust on local receptors.

23.6.20 The majority of the onshore development footprint, and adjacent habitats, sit within arable land. However, should construction dust settle on any nearby designated sites or BAP habitats this would represent a potential low magnitude effect. Given that these areas are considered highly sensitive habitats, a minor adverse impact is predicted in the absence of mitigation.

**Mitigation and residual impacts**

23.6.21 A range of air quality mitigation measures will be employed during the construction phase of the development. These will include:
• Best practice air quality management techniques will be employed as detailed within Section 27.6; and
• Works will be supervised by an ECW and liaison with the key stakeholders maintained throughout construction.

23.6.22 Implementation of the air quality control measures outlined in Chapter 27 will ensure that construction related air quality impacts, e.g. generation of fugitive dust are minimised, reducing a low magnitude effect to one of negligible. As such negligible residual impact is predicted.

Habitats and flora

23.6.23 The proposed onshore cable corridor predominantly passes through arable land of limited ecological interest. The cable landfall and route to the transition bays will, however, pass through a strip of coastal and transitional habitats that are potentially of more ecological value including coastal sand dunes and coastal vegetated shingle (both of which are BAP habitats).

23.6.24 **Table 23.14** provides a summary of the temporary and permanent areas associated with the onshore development footprint and an indication of the habitats affected. **Table 23.15** provides a summary of the temporary and permanent habitat losses.

**Table 23.14** Temporary and permanent areas required for the onshore development footprint

<table>
<thead>
<tr>
<th>Development element</th>
<th>Maximum total area</th>
<th>Habitats affected (approximate area)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permanent footprint</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>3.1ha</td>
<td>Arable (2.3ha), woodland (0.7ha), grassland (0.1ha)</td>
</tr>
<tr>
<td>Sealing end compounds</td>
<td>0.2ha</td>
<td>Woodland (0.1ha); arable (0.1 ha)</td>
</tr>
<tr>
<td>GWF transition bays</td>
<td>0.1ha</td>
<td>Arable (0.1ha)</td>
</tr>
<tr>
<td>New permanent access roads, turning area and drainage reserve</td>
<td>0.5ha</td>
<td>Woodland (0.1ha), arable (0.4ha)</td>
</tr>
<tr>
<td>Screening landform</td>
<td>4.3ha</td>
<td>Grassland (1.2ha); arable (2.9ha); woodland (0.2ha); hedgerow (220m)</td>
</tr>
<tr>
<td>Security area around substation</td>
<td>0.4ha</td>
<td>Grassland (0.05ha), arable (0.25ha), woodland (0.1ha)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8.6ha</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Temporary footprint**
### Development element

<table>
<thead>
<tr>
<th>Development element</th>
<th>Maximum total area</th>
<th>Habitats affected (approximate area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach working areas</td>
<td>2ha</td>
<td>Dune / shingle (2ha)</td>
</tr>
<tr>
<td>Beach access</td>
<td>1.1ha</td>
<td>Dune / shingle (1.1ha)</td>
</tr>
<tr>
<td>Cable corridor inland of beach/dune to GWF substation (working corridor including transition bays)</td>
<td>4.4ha</td>
<td>Arable (4.4ha); hedgerow (160m)</td>
</tr>
<tr>
<td>400kV cable corridor between transmission compound and sealing end compounds</td>
<td>0.7ha</td>
<td>Woodland (0.35ha*); grassland (0.3ha); arable (0.05ha)</td>
</tr>
<tr>
<td>132kV cable corridor between transmission compound and joint with existing Leiston A 132kV cables</td>
<td>0.8ha</td>
<td>Woodland (0.05ha*); arable (0.75ha)</td>
</tr>
<tr>
<td>Substation and sealing end compounds temporary laydown areas (excluding land already covered within cable corridor)</td>
<td>8.2ha</td>
<td>Arable (7.1ha**); grassland (1ha); woodland (0.1ha*)</td>
</tr>
<tr>
<td>Screening landform (areas returned to existing land use)</td>
<td>1.9ha</td>
<td>Arable (0.9ha); grassland (1ha)</td>
</tr>
<tr>
<td>Access roads and service reserves</td>
<td>0.4ha</td>
<td>Arable (0.4ha)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19.5ha</strong></td>
<td></td>
</tr>
</tbody>
</table>

* These are captured as permanent losses in Table 23.15

** 0.9ha of this arable area may be used to extend the screening landform. However, it will still be returned to arable use during the operation of GWF

### Table 23.15  Temporary and permanent habitat disturbance anticipated as part of the onshore development footprint

<table>
<thead>
<tr>
<th>Development element</th>
<th>Maximum total area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permanent losses</strong></td>
<td></td>
</tr>
<tr>
<td>Shingle / dune</td>
<td>0ha</td>
</tr>
<tr>
<td>Grassland</td>
<td>1.35ha</td>
</tr>
<tr>
<td>Woodland</td>
<td>1.7ha</td>
</tr>
<tr>
<td>Arable</td>
<td>6.05ha</td>
</tr>
<tr>
<td>Hedgerow</td>
<td>220m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9.55ha</strong></td>
</tr>
<tr>
<td><strong>Temporary disturbance</strong></td>
<td></td>
</tr>
<tr>
<td>Shingle / dune</td>
<td>3.1ha</td>
</tr>
<tr>
<td>Grassland</td>
<td>2.3ha</td>
</tr>
<tr>
<td>Woodland</td>
<td>n/a</td>
</tr>
<tr>
<td>Arable</td>
<td>13.6ha</td>
</tr>
<tr>
<td>Hedgerow</td>
<td>160m</td>
</tr>
</tbody>
</table>
**Direct damage**

**Arable**

23.6.25 The proposed substation and cable corridor is located largely on arable land, which is considered to be of negligible ecological value; therefore any impacts will be of **negligible significance**.

**Pasture**

23.6.26 2.2ha of the onshore development footprint sits within an area of grassland grazed by livestock (Broom Covert). This grassland is classified as NVC SD12 (grassland derived from mildly acidic coastal sands) a habitat type that is common along coastal areas within Suffolk. Broom Covert has been identified for future heathland restoration within the Sizewell Estate Land Management Plan (ADAS, 2006) and is an area of local importance.

23.6.27 The area of grassland affected by the onshore development footprint is considered to be one of the poorer examples of SD12 within Broom Covert. The proposal will result in the temporary loss of 2.2ha of this habitat (approximately 15% of Broom Covert) and is considered to represent an impact of medium magnitude. As such, an impact of **minor adverse significance** is predicted.

**Shingle / dune**

23.6.28 Impacts upon the shingle / dune habitats are considered within **Section 23.6.6** for the Suffolk Shingle Beaches CWS.

**Woodland**

23.6.29 As summarised within **Table 24.15**, the works associated with the onshore development footprint will potentially lead to permanent loss/damage of 1.7ha of mixed plantation woodland associated with Sizewell Wents (which represents approximately 50% of Sizewell Wents). Sizewell Wents is a young plantation woodland of relatively low ecological value but still represents a habitat of local importance. Given that the development could potentially result in the loss of up to 50% of this woodland it represents an effect of high magnitude. This represents an impact of **minor adverse significance**, in the absence of mitigation.

**Hedgerow**

23.6.30 Five short lengths of species poor hedgerow sit within the onshore development boundary, and total 380m in length. Whilst these hedgerows are only of local ecological value the loss of 380m represents an effect of medium magnitude. As such, **minor adverse impact** is predicted in the absence of mitigation.
Mitigation and residual impacts

23.6.31 The mitigation measures described in Section 23.6.10 will ensure that impacts to the sensitive shingle, dune and grassland habitats are minimised. In addition:

- Directional drilling methods will be used to cross both Sizewell Gap and the access road to Sizewell Hall. This will ensure that the four hedges lining both those roads (approximately 160m in total) are retained and undamaged during construction;

- Where possible, construction work areas will be accessed using existing tracks and roads; any access routes required across sensitive habitats, e.g. beach habitats, will be agreed in advance with Suffolk Coastal District Council;

- The substation design incorporates dedicated landscaping mitigation. This includes 4.3ha of new woodland planting (around the new substation and adjacent to the remaining area of Sizewell Wents woodland) and 1ha of fringing grassland and scrub habitats. The woodland will incorporate a mix of native tree and scrub species and a diversity of woodland edge, interior and understory habitats. The planting will include a mosaic of transitional habitats on the woodland edge including scrub and grassland. Further details are included within Chapter 20;

- The tree planting (to mitigate the loss of an area of Sizewell Wents) will be undertaken in line with the Sizewell vision for heathland restoration and planted adjacent to the remaining area of Sizewell Wents to aid colonisation and create a stable woodland block; and

- A long term landscape maintenance and management plan will be implemented to ensure the successful establishment of any new planting. The management of the woodland will include measures to maintain diversity of flora (e.g. control of sycamore regeneration and selective thinning to encourage a diverse ground flora).

Shingle / dune

23.6.32 Mitigation measures and residual impacts are discussed in Section 23.6.10 for the Suffolk Shingle Beaches CWS.

Pasture

23.6.33 2.2ha of pasture grassland (15% of existing 12ha Broom Covert grassland) will be lost as part of the GWF substation development. However, 1ha of the screening landform will be returned to pasture grassland and will be planted with grassland and heathland species in keeping with the surrounding landscape character. Whilst this may not fully mitigate for the loss of the 2.2ha of grassland pasture, it is felt to reduce the effect to one of low
magnitude. As such, a **minor adverse residual impact** is predicted upon pasture grassland habitats.

**Woodland**

23.6.34 1.7ha of mixed plantation woodland (associated with Sizewell Wents) will be lost as a result of the GWF substation development. A screening landform will be introduced (approximately 6.2ha in total, including areas that will be returned to their previous land use) which will include approximately 1.6ha of core woodland planting and 1.3ha of woodland edge and grassland habitats. Whilst this will not fully offset the potential tree losses (as the replanted trees will not be of the same maturity as those lost) it is expected to reduce the magnitude of this effect from high to medium. A **minor adverse residual impact** will remain following mitigation. This will eventually reduce to **negligible** as the new woodland matures over the subsequent years.

**Hedgerow**

23.6.35 The use of directional drilling techniques will completely avoid four lengths of hedgerow (along Sizewell gap and Sizewell Hall access road). A length of interrupted hedgerow along the southern boundary of Broom Covert will be lost; however the magnitude of the effect will reduce from medium to low. As such a **negligible residual impact** upon hedgerows is anticipated after mitigation.

**Reptiles**

23.6.36 The results of the 2006, 2007, 2010 and 2011 surveys show that there are three areas of suitable reptile habitat within the development footprint:

- 2ha of dune habitats associated with the cable corridor
- 160m of hedgerows along the cable corridor – two 40m lengths either side of Sizewell Gap and two 40m lengths either side of Sizewell Hall access Road; and
- 0.65ha of woodland edge / hedgerow associated with the GWF substation footprint.

23.6.37 These three areas have been shown to support low populations of slow worm, adder and grass snake and good populations of common lizard. These sites are regarded as being of county importance for reptiles.

23.6.38 The vegetation clearance and destructive works associated with the construction phase will have the potential to kill or injure reptiles using these areas, which are offences under the Wildlife and Countryside Act (1981) (as amended). The works have the potential to result in the temporary and permanent loss of potential feeding, basking, refuge, and hibernating areas.
23.6.39 Although the largest habitat losses are in areas of more sub-optimal habitat for reptiles (i.e. no reptiles were recorded in the open areas of arable or pasture or within the woodland interior during the surveys) the three areas of optimal reptile habitat listed above have the potential to be affected during the construction works. Destructive works to these areas would represent an effect of high magnitude upon reptile populations at all three sites.

23.6.40 Given the potential permanent disturbance / loss to areas of optimal reptile habitat in an area considered of county important for reptiles, a moderate adverse effect is predicted in the absence of mitigation.

Mitigation and residual impacts

23.6.41 A reptile translocation site has been identified to the south-east of the GWF substation (north of Sizewell Gap between the GGOWF substation and Sandy Lane) – refer to Figure 23.4. This 0.85ha site was previously arable but has been planted with 1m tall tree saplings (at an approximate density of one tree per 10m²) to eventually establish and act as landscape screening for GGOWF. The area was included in the reptile surveys and does not currently support any reptiles.

23.6.42 This receptor site is connected to the surrounding hedgerows adjacent to Sizewell Gap and Sandy Lane and will be allowed to naturalise as the trees continue to grow. It is expected that by 2013 the site will support rough grassland and open woodland habitats (with extensive gaps due to the tree planting density) and will represent a habitat suitable to support reptiles.

23.6.43 The area to the north of this reptile translocation site, and the areas surrounding the sealing end compounds, will not be farmed in the longer-term. These are expected to naturally revert to grassland and woodland edge habitats and will represent additional habitat for reptiles to move into as trees in the translocation site mature.

23.6.44 A range of mitigation measures will be employed during the construction phase of the development and will include the following:

- Directional drilling methods will be utilised to avoid some areas of optimal reptile habitat, i.e. under the dune habitats (2ha), under Sizewell Gap and the Sizewell Hall access road (avoiding the loss of 160m of hedgerows lining those roads);

- A detailed mitigation strategy will be developed post-consent, in consultation with Natural England, for the translocation of reptiles from habitats that cannot be avoided during construction (0.65ha of woodland edge habitat). The strategy will include:
  - Reptile exclusion fencing arrangement (including fencing at the receptor site to prevent ingress of existing reptile populations);
  - Proposed trapping methodology – timing and methods; and
Details of the proposed receptor site – location, existing reptile populations and evidence of sufficient reptile carrying capacity;

- Further habitat improvements (to improve the reptile carrying capacity) will be undertaken at the identified reptile receptor site, including creating wood piles to provide reptile refugia and improving habitat connectivity between the receptor site and Sizewell Wents;

- All works on site that could potentially cause harm to reptiles (e.g. installation and removal of exclusion fencing and habitat manipulation) will be supervised by a suitably qualified ecologist (a watching brief); and;

- Site personnel will be briefed on these commitments ahead of construction.

**Dune habitats**

23.6.45 The use of directional drilling techniques will ensure that the onshore cable corridor does not result in any excavation or vegetation clearance within these dune habitats. As such no residual impacts upon reptile populations associated with the dune habitats are predicted.

**Hedgerows associated with the cable corridor**

23.6.46 The use of directional drilling techniques will ensure that the four lengths of hedgerow along the cable corridor will not require any excavation or vegetation clearance. As such no residual impacts upon reptile populations associated with the cable corridor hedgerows are predicted.

**Woodland edge / hedgerow associated with the substation footprint**

23.6.47 The mitigation measures will ensure that reptiles associated with the 0.65ha of woodland edge habitat, including the interrupted hedge line south of Broom Covert) will be relocated to the identified receptor habitat ahead of construction. With the outlined mitigation in place harm to reptiles will be minimised as far as possible, reducing the high magnitude effect to low. As such any residual effects will be reduced to negligible.

**Bats**

*Direct disturbance to roosting bats*

23.6.48 Three bat roosts, supporting single bats, were identified within Sizewell Wents during the 2011 bat survey. No other roosts were identified and there was no evidence (e.g. droppings and urine staining) to suggest the presence of a maternity roost. Given the transient nature of bats it is likely these trees are only used on an occasional basis. In total 11 trees were identified within Sizewell Wents with the potential to support bat roosts. However, the trees are generally young and simple in form with limited suitable features for roosting (e.g. cracks, crevices, fallen limbs or dense ivy growth).
Without mitigation the works proposed within Sizewell Wents have the potential to directly affect the individual bats using these three bat roosts. Given the protection afforded to bats any direct disturbance to a bat roost represents an effect of high magnitude. As such, a major adverse impact is predicted in the absence of mitigation.

**Mitigation and residual impacts**

A range of mitigation measures will be employed during the construction phase of the development and will include the following:

- A European Protected Species licence will be required ahead of any works that may affect these features identified as supporting roosting bats or with the potential to support roosting bats. A dedicated bat mitigation strategy will be developed in consultation with Natural England to inform the licence application. The strategy will include:
  - Details of the features affected (roosts and potential roost sites);
  - Details of bat usage of those features;
  - Details of the approach to mitigation (soft-felling under supervision, tree limb removal, etc); and
  - Proposals to encourage future bat usage of the area following the completion of construction.

- Bat boxes will be introduced into the retained woodland to increase the potential for the area to support roosting bats in the future. In time the newly planted trees and other maturing trees in the area may also offer suitable habitat (as they develop voids, cracks, ivy growth);

- The works areas, including vehicle access routes, will be demarcated to avoid any accidental damage to adjacent habitats; and

- Site personnel will be briefed on these commitments ahead of construction.

With the outlined mitigation in place no direct disturbance to bats will occur. As such, the high magnitude effect will be reduced to negligible, and any residual impacts will also be reduced to negligible.

**Indirect disturbance to bats**

Bat commuting and foraging activity was recorded within the onshore development footprint and was focussed along linear hedgerow features and the Sizewell Wents woodland.

The works will lead to the permanent loss of 1.7ha of woodland within Sizewell Wents. Whilst the wider Sizewell Estate supports a mosaic of good bat habitat (large areas of woodland with good connectivity) the Sizewell
Wents block of woodland sits on the outskirts of this area within arable land and has limited connectivity to these wider habitats.

23.6.54 The works could also lead to the loss of five short sections of interrupted species poor hedgerow (two along Sizewell Gap, two along the access road to Sizewell Hall, and one hedge south of Broom Covert). This minor alteration to potential foraging and commuting corridors is not considered to be significant given the small length that would potentially be lost and the already interrupted nature of these hedgerows.

23.6.55 Should any works be undertaken outside of daylight hours this may also lead to the disturbance / displacement of commuting and foraging bats, as a result of general site presence, noise, and lighting. 24 hour security lighting may be required for some of the onshore works areas during construction. There is, however, an abundance of optimal bat foraging and commuting habitat within the wider area (as detailed in Section 23.4).

23.6.56 The works are not expected to lead to the removal of any other connective habitat, e.g. hedgerows, and so should not impact potential commuting routes. However, a large block of woodland, known to be used for foraging by bats present in the wider area, will be permanently removed during construction. As such the magnitude of the effect is anticipated to be low to medium on commuting and foraging bats in the area.

23.6.57 Given the limited potential for disturbance to key commuting / foraging corridors, a **minor to moderate adverse impact** is anticipated in the absence of mitigation.

**Mitigation and residual impacts**

23.6.58 A range of mitigation measures will be employed during the construction phase of the development and will include the following:

- Lighting will be placed as far from linear features (potentially suitable for foraging and commuting bats) as is conducive with security and engineering requirements. Those lights closest to features will take into account the following:
  - Sodium lamps will be used. They are preferable to mercury or metal halide lamps (as they attract fewer insects);
  - Light intensity will be as low as is permissible; and
  - Light spill towards any retained linear features will be reduced to a minimum (using cowls as necessary);
- The hedgerow either side of Sandy Lane (to the north of the proposed substation) will be augmented by filling gaps to offer increased landscape screening. This will also serve to improve the connectivity between Sizewell Wents and the surrounding areas for commuting bats;
Bat boxes will be introduced into the retained woodland to increase the potential for the area to support roosting bats in the future. In time the newly planted trees and other maturing trees in the area may also offer suitable habitat (as they develop voids, cracks, ivy growth);

The use of directional drilling will prevent the loss of four hedgerow sections (running either side of Sizewell Gap road and the access to Sizewell Hall) in the footprint of the cable corridor and also minimise general habitat disturbance;

The works areas, including vehicle access routes, will be demarcated to avoid any accidental damage to adjacent habitats; and

Site personnel will be briefed on these commitments ahead of construction.

23.6.59 With the outlined mitigation in place harm any disturbance to bat foraging and commuting habitat will be minimised as far as practicable. As such, the low to medium magnitude impact will be reduced to negligible, and any residual impacts will also be reduced to negligible.

Breeding birds

23.6.60 The potential effects of the construction work are two-fold. Loss of habitat, along the cable corridor and substation footprint; and disturbance due to the noise, vibration, lighting and visual intrusion of the work (Hockin et al. 1992 and Hill et al. 1997).

Direct impacts (habitat loss)

23.6.61 Direct impacts relate to the damage or destruction of any wild birds eggs or nests, killing or injuring a wild bird or intentionally or recklessly disturbing a Schedule 1 species while it is nesting.

23.6.62 Suitable nesting habitat exists within the onshore development footprint including areas of woodland, rough grassland, scrub, arable farmland, hedgerows, and dune / shingle. A single pair of herons has been recorded nesting in Sizewell Wents which is considered to be of local importance. No Schedule 1 species and/or species associated with the nearby Sizewell Marshes SSSI and Sandlings SPA were recorded within the GWF onshore development footprint.

23.6.63 Given that the onshore development footprint includes suitable nesting habitat, there is the possibility of damaging an active nest site, during construction, e.g. vegetation clearance within the woodland / grassland hedgerow areas. This represents an impact of high magnitude, and a minor adverse impact upon breeding birds is predicted in the absence of mitigation.
Indirect impacts (disturbance)

23.6.64 The potential disturbance of birds associated with Sandlings SPA, Leiston to
Aldeburgh SSSI and Sizewell Marshes SSSI have been considered within
Section 23.6.12.

23.6.65 The noisy nature of the works required along the foreshore for the cable
landfall and directional drilling works could lead to the temporary disturbance
to any birds utilising the area. However, the directional drilling works
associated with the landfall will only last approximately two months. It is also
accepted the beach area is already disturbed by human activities (dog
walkers, holiday huts etc), and there is an extensive coastline immediately
north and south of the proposed landfall containing the same habitat type,
that will be available to birds if they are temporarily disturbed.

23.6.66 Bird species may also be disturbed by works along the cable corridor and at
the substation site. In general, birds are less disturbed by vehicles than
people, and less disturbed by continual noise than sudden / intermittent
noise. Light spill from development can also cause birds to avoid potential
nest sites. Given the likely timescale of the main substation works it is
unlikely that birds will habituate to the disturbance and in this assessment, it
is assumed that disturbance from the construction work will lead to complete
avoidance and thus an effective loss of habitat for its duration.

23.6.67 Depending on the timing of the site preparation works (vegetation clearance
works), there is the potential to disturb nesting birds (an offence under the
Wildlife and Countryside Act 1981 (as amended). As stated earlier Schedule
1 birds (which are afforded additional protection under the Act) are not known
to be present in the works area.

23.6.68 The potential effects of disturbance during construction work are in most
instances short-term; however, any disturbance to nesting birds as a result of
construction activities, would represent an impact of high magnitude. Given
that the study area is considered to be of local sensitivity for breeding birds, a
minor adverse effect is predicted in the absence of mitigation.

Mitigation and residual impacts

23.6.69 A range of mitigation measures will be employed during the construction
phase of the development, these include:

- Directional drilling methods to install the cable will be utilised under the
  valuable coastal habitats and under the two hedge-lined roads. This
  will avoid damage to the shingle and sand dune habitats, and avoid
  the loss of four hedgerow sections (all potentially suitable habitats for
  nesting birds);

- Any necessary vegetation clearance will, where possible, be
  undertaken outside of the breeding bird season, which runs between
  the beginning of March to the end of August;
• Should the works be undertaken during the breeding bird season (beginning of March to end of August), areas of vegetation likely to be directly disturbed or damaged will be checked by an appropriately qualified ecologist for the presence of nesting birds immediately prior to work commencing;

• Any felled / cleared vegetation will be removed, destroyed, or chipped before the beginning of March, to prevent birds nesting in piles of suitable material (this material may be used elsewhere on site as part of other mitigation, e.g. to enhance the reptile receptor site);

• To discourage ground nesting birds from using the areas within the proposed working footprint prior to and during construction, vegetation within the site will be cut to low levels and maintained, to prevent vegetation establishing and offering suitable nesting habitat;

• If nesting Schedule 1 birds are found (which are afforded additional protection under the Wildlife and Countryside Act 1981 (as amended)) works should halt and Natural England be contacted immediately;

• If nests of non Schedule 1 birds are found, the nests will be marked (with an exclusion zone) and avoided. Clearance of vegetation around nests will not be undertaken until the birds have fledged. If the birds are showing signs of disturbance (i.e. leaving the nest for longer than 30 minutes on any one occasion) then the exclusion zone will be increased;

• Best practice noise control and management techniques will be employed as detailed in Chapter 26 Noise;

• Construction lighting will be low intensity and appropriately located / directed in order to minimise lighting disturbance. Permanent lighting associated with the new substation will be minimal;

• Bird boxes will be provided on retained trees in the site to provide nesting habitat to compensate for the temporary loss of trees; and

• Site personnel will be briefed on these commitments ahead of construction.

23.6.70 The nature of the directional drilling means that physical disturbance within the dune / shingle region will be avoided and thus disturbance to birds will be kept to a minimum reducing a high magnitude impact to a low magnitude impact. With the outlined mitigation in place any risk of indirect disturbance will also be reduced to an impact of low magnitude in the rest of the works footprint. This combined with largely temporary and localised habitat losses will result in negligible residual impacts.

**Amphibians (excluding great crested newt)**

23.6.71 No water bodies lie within or close to the works footprint, and as such, no effects on amphibians are anticipated.
Otter

23.6.72 No signs of otter have been recorded within the proposed works footprint. Given the lack of water bodies within the works footprint, otter presence is considered unlikely. They have, however, been recorded within the drains associated with Sizewell Marshes SSSI to the north of the works footprint. As such there is the potential that this species may pass through the works site on passage to other water bodies and/or suitable holt areas.

23.6.73 Potential construction phase effects on otters are therefore only likely to be related to the potential trapping of this species in open pits and storage compounds, which represents an effect of high magnitude. Due to the low value of the habitats on site for the species a minor adverse impact is anticipated in the absence of mitigation.

Mitigation and residual impacts

23.6.74 The range of mitigation measures will include:

- Simple construction house-keeping activities will minimise any impacts. This includes:
  - Any trenches or pits are covered, or have a means of escape for any animal that might fall in (e.g. a ramp);
  - Construction materials are safely stored away at the end of the day; and
  - Natural linear access features are left unobstructed.
- Site personnel will be briefed on these commitments ahead of construction.

23.6.75 The successful implementation of the outlined mitigation measures should ensure that no otters are trapped or otherwise harmed during the construction phase, i.e. reducing the high magnitude effect to a low magnitude effect. As such a negligible residual impact is anticipated.

Water vole

23.6.76 The nearest suitable habitat for water voles are the ditches within Sizewell Marshes SSSI (where the species is known). These ditches are situated approximately 100m from any proposed construction activities. Given the lack of watercourses within or close to the construction footprint no effect on water vole is anticipated.

Badger

23.6.77 No active setts were identified within the works footprint although badger foraging activity was recorded.

23.6.78 During construction there will be small-scale loss of potential foraging habitat as a result of the substation development. Any loss of foraging habitat...
through the laying of the cable is anticipated to be temporary with most habitats being reinstated following construction. In addition there are large amounts of suitable habitat within the wider area (e.g. Sizewell Common and other arable habitats) which badgers can utilise. It is considered unlikely that the proposals will significantly impact on badgers utilising the area and the magnitude of this potential effect is considered to be low.

23.6.79 Given the small areas of foraging habitat that would be disturbed during the construction phase and the low probability of disturbing any active setts, a negligible impact is anticipated in the absence of mitigation.

Mitigation and residual impacts

23.6.80 A range of mitigation measures will be employed during the construction phase of the development and will include the following:

- A walkover survey will be undertaken prior to the commencement of construction to confirm the presence / absence of badger setts which may not have been previously recorded;
- Simple construction house-keeping activities would be introduced to minimise any impacts. This includes:
  - Any trenches or pits will be covered, or have a means of escape for any animal that might fall in (e.g. a ramp);
  - Construction materials to be safely stored away at the end of the day; and
  - Natural linear access features will be left unobstructed.
- Site personnel will be briefed on these commitments ahead of construction; and
- If works are to occur within 30m of an active main badger sett, a Natural England licence to disturb a badger sett will be required to allow the proposed works to take place.

23.6.81 The successful implementation of the outlined mitigation measures will further minimise the risk of any badgers being harmed during the construction phase to a negligible magnitude and, as such, no residual impact on badgers is anticipated.

Invertebrates

23.6.82 Sizewell Marshes SSSI is known to support numbers of nationally rare and uncommon invertebrates. However, the majority of the work will be undertaken on agricultural land (approximately 19.65ha) which is considered to be of limited value for terrestrial invertebrates.

23.6.83 The construction works will lead to the temporary and permanent loss of small areas of semi-natural habitat including woodland edges (0.65ha), an
area of short grazed pasture (2.2ha), and an area of shingle and dune habitat (2ha). These areas within the onshore development footprint are considered to be of local sensitivity for terrestrial invertebrates. However, the potential permanent loss of these areas represents an effect of high magnitude.

23.6.84 Given that these limited areas may support a locally important assemblage of invertebrates a **minor adverse impact** is anticipated in the absence of mitigation.

**Mitigation and residual impacts**

23.6.85 A range of mitigation measures will be employed during the construction phase of the development and will include the following:

- The works areas, including vehicle access routes, will be demarcated to avoid any accidental damage to adjacent habitats;
- The use of directional drilling will be used to avoid damage to shingle / dune and hedgerow habitats; and
- The new landscape planting area will include a mixture of woodland, scrub and grassland, providing a more diverse range of habitats compared to the existing woodland.

23.6.86 Disturbing or destructive works on the vegetated shingle and dune habitats, where the most invertebrate interest is anticipated, will be avoided through the use of directional drilling. However, some temporary damage and permanent loss to limited areas of potentially suitable terrestrial invertebrate habitat (grazed pasture and woodland edge habitats) will remain. As such, the likelihood of the impact occurring to this locally important resource will be reduced from a high magnitude effect to one of low magnitude. Overall a **negligible residual impact** is anticipated.

**Other notable species of conservation importance**

23.6.87 Of those species previously mentioned (hedgehog, brown hare and water shrew) only hedgehog and brown hare may be potentially disturbed during the construction phase. Given the lack of water bodies within or close to the works footprint, **no effects** on water shrew are anticipated.

23.6.88 Direct harm to hedgehogs is the most likely effect should works be undertaken to suitable habitat while the species is hibernating (typically November to March). As with other nocturnal mammals (e.g. badgers and otters), there is also the potential for hedgehogs and brown hare (which are largely nocturnal) to get trapped in open pits and storage compounds during the construction period.

23.6.89 Limited areas of suitable habitat will be permanently or temporarily affected including areas of woodland, scrub (suitable for hibernating hedgehogs) and areas of open farmland (suitable for hares and foraging hedgehogs). There
are large areas of suitable habitat for both hedgehog and hare to utilise in the wider area and the loss of these small areas is likely to be of limited significance for the species, i.e. an impact of low magnitude.

23.6.90 Given that the onshore development footprint is locally important to hedgehogs and brown hare a negligible impact is anticipated in the absence of mitigation.

23.6.91 Although negligible impacts are predicted the measures outlined earlier for badgers and otters will ensure that impacts upon brown hare and hedgehogs remain negligible.

23.7 Assessment of Impacts during Operation

23.7.1 There are unlikely to be any additional operational impacts on terrestrial ecology once the GWF substation, sealing end compounds, onshore transition bays, and onshore cables are installed and reinstatement works have taken place. Mitigatory tree planting will take time to establish but other disturbed habitats, being mostly arable land, will re-establish quickly post construction, and as such negligible impacts are anticipated.

23.7.2 In the event of a cable failure, it may be necessary to excavate the cable trench and replace / repair the faulty cables along limited stretches. If repair works are required, the mitigation measures proposed previously for the construction activities will be adhered to, and possible impacts minimised. This represents an effect of negligible magnitude and an impact of negligible significance.

23.7.3 There is the potential for indirect disturbance from the proposed operational lighting that will be located at the substation site entrance. However, this lighting will only be used infrequently during periodic maintenance activities (which will normally be programmed for daylight hours anyway). This infrequent activity represents an effect of negligible magnitude and represents an impact of negligible significance.

23.7.4 There may be limited disturbance associated with the operational noise of the substation. However, operational noise is expected to be below levels expected to disturb any of the species identified on site (refer to Chapter 26 Noise).

23.7.5 The potential for operational surface water flood flows to affect Sizewell Marshes SSSI is considered within Chapter 22 Geology, Hydrogeology, Land Quality and Flood Risk.
23.7.6 Overall a **negligible impact** is anticipated during the operational phase.

23.8 **Assessment of Impacts during Decommissioning**

23.8.1 When GWF is decommissioned it will adhere to any future or modified legislation relevant at that time. The specific onshore decommissioning processes are expected to include:

- Export cables between the landfall and the substation site will be disconnected and left in situ;
- Any equipment installed within the onshore transition bays will remain in situ, unless otherwise agreed with the relevant planning authority;
- The above ground substation assets (comprising the GWF compound and the transmission compound) will be dismantled and removed from site;
- The substation foundations will be removed to 1m below ground level; and
- The landform will be retained.

23.8.2 The demolition of the substation will lead to temporary disturbance, of at worse a similar scale and magnitude to that of the construction phase, albeit without the removal of earthworks. As such the relevant impacts in the construction section of this assessment should be referred to along with any proposed mitigation.

23.8.3 Given the temporary disturbance associated with demolition works a **negligible effect** on terrestrial ecology is anticipated following mitigation.

23.9 **Inter-relationships**

23.9.1 **Table 23.16** summarises those inter-relationships that are considered of relevance to terrestrial ecology and identifies where within the ES these relationships have been considered.

23.9.2 **Chapter 28 Assessment of Inter-relationships** provides a more detailed holistic overview of the potential impacts that may manifest on terrestrial ecology receptors.

<table>
<thead>
<tr>
<th>Inter-relationship</th>
<th>Section where addressed</th>
<th>Linked Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence of noise disturbance on protected species</td>
<td>Section 23.6</td>
<td>Chapter 26 Noise</td>
</tr>
<tr>
<td>Influence of air quality impacts on sensitive habitats</td>
<td>Section 23.6</td>
<td>Chapter 27 Air quality</td>
</tr>
</tbody>
</table>
23.10 **Cumulative Impacts**

23.10.1 The unmitigated impacts identified during the construction (Section 23.6) of the GWF project that have the potential to result in cumulative effects comprise:

**Construction**

- Damage and disturbance to designated habitats and associated species within Sizewell Marshes SSSI and Suffolk Shingle Beaches CWS;
- Damage and loss of BAP habitats of conservation importance;
- Temporary and permanent disturbance/loss to areas of optimal reptile habitat;
- Disturbance to key bat commuting / foraging corridors;
- Damage or disturbance to nesting bird species;
- Disturbance to badger foraging habitat and low probability of disturbing any active setts;
- Temporary and permanent loss of small areas of suitable terrestrial invertebrate habitat; and
- Potential harm to hibernating hedgehogs.

**Operation**

23.10.2 No impacts with effects above negligible are anticipated for the operational phases of the project as per Sections 23.7, therefore no cumulative impacts are possible during the operation phase of GWF.

**Decommissioning**

- Damage and disturbance to designated habitats and associated species within Sizewell Marshes SSSI and Suffolk Shingle Beaches CWS;
- Damage and loss of BAP habitats of conservation importance;
- Temporary and permanent disturbance/loss to areas of optimal reptile habitat;
- Disturbance to key bat commuting / foraging corridors;
- Damage or disturbance to nesting bird species;
- Disturbance to badger foraging habitat and low probability of disturbing any active setts;
- Temporary and permanent loss of small areas of suitable terrestrial invertebrate habitat; and
- Potential harm to hibernating hedgehogs.
23.10.3 Other onshore activities in the study area include the GGOWF onshore electrical connection, Sizewell B Dry Fuel Store, proposed new nuclear development (Sizewell C) and the decommissioning of Sizewell A.

GGOWF onshore electrical connection

23.10.4 GGOWF has a development footprint immediately adjacent to GWF and is expected to result in similar construction impacts. However, construction of GGOWF will be completed in 2011/2012 and as such there will be no overlap with the construction phase for GWF. Therefore there will be no cumulative impact associated with the construction of GWF and the construction of GGOWF.

Sizewell B Dry Fuel Store

23.10.5 The proposed Sizewell B Dry Fuel Store has a construction phase expected to take place during 2012/2013 (BEGL, 2010), and again there is expected to be little or no overlap with the construction phase for GWF. In addition, the associated ES does not identify any significant impacts upon terrestrial ecology receptors in the absence of mitigation. Therefore there will be no cumulative impact associated with the construction of GWF and the construction of the Sizewell B Dry Fuel Store.

Sizewell C

23.10.6 This proposed development is expected to be located to the north of the existing Sizewell power station infrastructure. Construction is not expected to begin on Sizewell C until approximately 2017 at the earliest. Should the GWF onshore construction works extend beyond 2017 there is the potential for a cumulative impact upon terrestrial ecology receptors. Given the absence of any details of the Sizewell C proposals it is not possible to undertake a quantitative assessment of this potential cumulative impact at this stage. However, it is acknowledged that there is the potential for a cumulative impact upon terrestrial ecology receptors should the construction stages of GWF and Sizewell C overlap.

Sizewell A decommissioning

23.10.7 The main decommissioning activity associated with this (the preparation for care and maintenance stage) is programmed to take place between 2009 and 2019 (British Nuclear Group, 2005). However, the associated ES did not report any significant impacts upon terrestrial ecology receptors. Therefore there are not anticipated to be any cumulative impacts with the construction of GWF.

23.10.8 Overall there are not considered to be any significant cumulative impacts between the construction of GWF and any other known or planned activities.
GWF decommissioning and other onshore activities

23.10.9 GWF will have an operational design life of 25 years and would be programmed for decommissioning in approximately 2045. At this stage the GGOWF onshore electrical connection will also be near the end of its operational design life, Sizewell B Dry Fuel Store and the proposed new nuclear development (Sizewell C) should both be operational and the decommissioning of Sizewell A will have entered its care and maintenance phase.

GGOWF onshore electrical connection

23.10.10 GGOWF also has an operational design life of 25 years and there is the potential that both GWF and GGOWF could be decommissioned at the same time. Given the proximity and similarity of these two onshore developments, decommissioning impacts are considered to be effectively the same should one or both developments be decommissioned. There is not expected to be an associated increase in magnitude for any of the reported impacts. Therefore there are not anticipated to be any cumulative impacts with the decommissioning of GWF.

Sizewell B Dry Fuel Store

23.10.11 Sizewell B Dry Fuel Store will still be operational at this time (expected to be operational until 2099). There are no reported impacts upon terrestrial ecology receptors during the operation of the dry fuel store (BEGL, 2010), therefore there are not anticipated to be any cumulative impacts with the decommissioning of GWF.

Sizewell C

23.10.12 It is assumed that Sizewell C will be operational in 2045. The expected operational lifetime of Sizewell C is in excess of 60 years (DECC, 2010) and it is expected that the earliest that it would begin decommissioning would be approximately 2080. Given the absence of any details of the Sizewell C proposal it is not possible to undertake a quantitative assessment of the potential cumulative impact with the decommissioning of GWF at this stage.

Sizewell A decommissioning

23.10.13 Sizewell A will be in its ‘care and maintenance’ stage of decommissioning between 2019 and 2100. The associated ES did not report any significant impacts upon terrestrial ecology receptors during this stage (British Nuclear Group, 2005). Therefore there are not anticipated to be any cumulative impacts with the decommissioning of GWF.

23.11 Monitoring

23.11.1 A long term landscape maintenance and management plan will be implemented to ensure the successful establishment of any new planting associated with the new landform. The management of the woodland will
include measures to maintain diversity of flora (e.g. control of sycamore regeneration and selective thinning to encourage a diverse ground flora).

23.11.2 No other monitoring is proposed for terrestrial ecology.

23.12 Summary

23.12.1 *Table 23.17* provides a summary of the predicted impacts associated with the construction, operation and decommissioning of the GWF, upon the terrestrial ecology resource.

<table>
<thead>
<tr>
<th>Description of Impact</th>
<th>Impact</th>
<th>Potential Mitigation Measures</th>
<th>Residual impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical damage to designated habitats (Sizewell Marshes SSSI)</td>
<td>Minor adverse</td>
<td>A Construction Code of Practice will be developed in consultation with Natural England, which will comply with relevant PPGs, to minimise the risk of accidental pollution incidents.</td>
<td>Negligible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Directional drilling will be used to avoid sensitive foreshore habitats (CWS).</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Where possible existing access tracks will be used. Access tracks along the foreshore will be protected with gridded matting ahead of any foreshore works.</td>
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<tr>
<td></td>
<td></td>
<td>Where possible, areas temporarily affected by works will be restored to at least their original condition through planting, smoothing of tracks and/or natural regeneration.</td>
<td></td>
</tr>
<tr>
<td>Indirect disturbance to designated sites (noise)</td>
<td>Minor adverse</td>
<td>Best practice noise control and management techniques will be employed as detailed within <em>Chapter 26 Noise</em>.</td>
<td>Minor adverse</td>
</tr>
<tr>
<td>Indirect disturbance to designated sites</td>
<td>Minor adverse</td>
<td>Best practice noise control and management techniques will be employed as detailed within <em>Chapter 27</em>.</td>
<td>Negligible</td>
</tr>
<tr>
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<td>Impact</td>
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<td>Residual impact</td>
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<tr>
<td>(air quality)</td>
<td></td>
<td><strong>Air Quality.</strong></td>
<td></td>
</tr>
<tr>
<td>Damage to habitats and flora (arable)</td>
<td>Negligible</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Damage to habitats and flora (pasture)</td>
<td>Minor adverse</td>
<td>The new landscape mitigation area will include grassland and transitional plant communities to offset grassland losses.</td>
<td>Minor adverse</td>
</tr>
<tr>
<td>Damage to habitats and flora – (woodland)</td>
<td>Minor adverse</td>
<td>The design will include new landscape planting to offset any losses and will comprise native species within a range of woodland and connecting habitats.</td>
<td>Minor adverse reducing to negligible</td>
</tr>
<tr>
<td>Damage to habitats and flora – (hedgerow)</td>
<td>Minor adverse</td>
<td>Directional drilling will be used to avoid four of the five lengths of hedgerow within the development footprint.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Indirect impact to habitats and flora (air quality)</td>
<td>Minor adverse</td>
<td>Best practice air quality control and management techniques will be employed as detailed within Chapter 27 Air Quality.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Reptiles (associated with dune habitats)</td>
<td>Moderate adverse</td>
<td>Directional drilling will avoid dune and hedgerow habitats known to support reptiles.</td>
<td>No impact</td>
</tr>
<tr>
<td>Reptiles (associated with hedgerows along the cable corridor)</td>
<td>Moderate adverse</td>
<td></td>
<td>No impact</td>
</tr>
<tr>
<td>Reptiles (associated with woodland edge within the substation)</td>
<td>Moderate adverse</td>
<td>The 0.65ha of woodland edge habitats known to support reptiles will be subject to a dedicated reptile mitigation strategy that will be developed in consultation with NE.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Description of Impact</td>
<td>Impact</td>
<td>Potential Mitigation Measures</td>
<td>Residual impact</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------</td>
<td>-------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>footprint)</td>
<td></td>
<td>A 0.85ha reptile receptor site has been identified and will be enhanced ahead of any reptile translocation.</td>
<td></td>
</tr>
<tr>
<td>Direct disturbance to roosting bats</td>
<td>Major adverse</td>
<td>An EPS licence will be obtained to ensure that bat features are carefully removed ahead of works without any harm to the bats themselves.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Bats</td>
<td>Minor to moderate adverse</td>
<td>Pre-construction bat roost surveys will be undertaken to confirm no bat usage within woodland. Light pollution sources will be minimised. Mitigatory planting will include night-flowering and nectar-rich plant species. Bat boxes will be provided in the site. Directional drilling will avoid loss of hedgerow habitats (an important linear feature for commuting bats)</td>
<td>Negligible</td>
</tr>
<tr>
<td>Direct disturbance to breeding birds (habitat loss)</td>
<td>Minor adverse</td>
<td>Directional drilling will be used to avoid sensitive foreshore habitats. Any vegetation clearance will be undertaken outside of the breeding bird season. Mitigatory planting will provide nesting areas. Nest boxes will be provided.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Indirect disturbance to breeding birds</td>
<td>Minor adverse</td>
<td>Best practice noise control and management techniques will be employed as detailed in Chapter 26 Noise. Construction lighting will be low intensity and appropriately located / directed in</td>
<td>Negligible</td>
</tr>
<tr>
<td>Description of Impact</td>
<td>Impact</td>
<td>Potential Mitigation Measures</td>
<td>Residual impact</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>order to minimise lighting disturbance. Permanent lighting associated with the new substation will be minimal.</td>
<td></td>
</tr>
<tr>
<td>Amphibians</td>
<td>No impact</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Otters</td>
<td>Minor adverse</td>
<td>Good site housekeeping to minimise the risk of otters becoming trapped.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Water voles</td>
<td>No impact</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Badgers</td>
<td>Negligible</td>
<td>A pre-construction survey will be undertaken to confirm badger usage. If a main badger sett is subsequently identified within the works footprint a NE badger licence will be required to close that sett.</td>
<td>No impact</td>
</tr>
<tr>
<td>Terrestrial invertebrates</td>
<td>Minor adverse</td>
<td>Directional drilling will be used to avoid sensitive foreshore habitats.</td>
<td>Negligible</td>
</tr>
<tr>
<td>Other notable species</td>
<td>Negligible</td>
<td>Suitable hibernation habitat (for hedgehogs) will be hand searched ahead of construction to ensure that.</td>
<td>Negligible</td>
</tr>
<tr>
<td><strong>Operation Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational impacts</td>
<td>Negligible</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Decommissioning Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decommissioning impacts</td>
<td>At worst as per construction</td>
<td>As per construction</td>
<td>As per construction</td>
</tr>
</tbody>
</table>
23.12.2 The unmitigated impacts identified for the GWF project comprise minor to moderate adverse impacts during construction and decommissioning. It has been identified that there will be no significant terrestrial ecology impacts associated with other potential development in the area. Therefore, there are not anticipated to be any cumulative impacts.
23.13 References


British Nuclear Group (2005) Sizewell A Environmental Statement


Department of Energy and Climate Change (2011a) Overarching National Policy Statement for Energy (EN-1)

Department of Energy and Climate Change (2011b) National Policy Statement for Electricity Network Infrastructure (EN-5)


GGOWL (2005) GGOWF ES.

GGOWL (2006) GGOWF Sizewell Wents Onshore ES.


SSE Renewables and RWE Npower Renewables Limited (2010) Galloper Wind Farm Project Scoping Study.