



Rampion Offshore Wind Farm



ES Section 24 – Terrestrial Ecology

RSK Environmental Ltd

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E.ON Climate & Renewables UK Rampion Offshore Wind Limited

CONTENTS

24	ECOLOGY	24-1
24.1	Introduction	24-1
24.2	Legislation and Policy Context	24-1
24.3	Assessment Methodology.....	24-5
24.4	Environmental Baseline	24-22
24.5	Predicted Impacts	24-48
24.6	Mitigation Measures.....	24-61
24.7	Significance of Residual Effects.....	24-80
24.8	Cumulative Impacts	24-81
24.9	References	24-88

Tables

Table 24-1: Relevant Scoping Responses.....	24-6
Table 24-2: Detailed (Phase 2) Ecological Surveys Undertaken for the Proposed Cable Route.....	24-15
Table 24-3: Detailed (Phase 2) Ecological Surveys Undertaken for the Proposed Substation	24-17
Table 24-4: Receptor Sensitivity Examples	24-18
Table 24-5: Badger Setts Identified along Proposed Cable Route/Substation Site	24-34
Table 24-6: Ecological Receptor Value.....	24-44
Table 24-7: Summary of Residual Effects	24-83

Figures

Figure 24.1: Designated Sites Crossed by the Development Area (Maps 1 – 4)
Figure 24.2: Botanical Phase 1 Survey (Maps 1 – 18)

24 ECOLOGY

24.1 Introduction

- 24.1.1 This section of the Environmental Statement (ES) reports the assessment of potential ecological impacts that may arise from construction of the Onshore Project. Potential impacts from the offshore elements of the project are discussed in Section 8 (Benthic Ecology), Section 9 (Fish Ecology), Section 10 (Marine Ornithology) and Section 11 (Marine Mammals).

24.2 Legislation and Policy Context

Key Legislation

- 24.2.1 **Wildlife and Countryside Act 1981 (as amended) (WCA):** Provides a range of protection relating to wild birds, plants and other animals including bats, great crested newt, reptiles, badger and water vole.
- 24.2.2 **Countryside and Rights of Way Act 2000:** Strengthens the protection of Sites of Special Scientific Interest (SSSI) and protected species. Some provisions have now been superseded by the NERC Act 2006 (see below).
- 24.2.3 **Natural Environment and Rural Communities Act 2006 (NERC):** Imposes a duty on public bodies to conserve biodiversity, including a requirement to compile a list of habitats and species of principal importance for the purpose of conserving biodiversity.
- 24.2.4 **National Parks and Access to the Countryside Act 1949:** Provides a framework for creating National Parks, Areas of Outstanding Natural Beauty (AONB) and Local Nature Reserves (LNR).
- 24.2.5 **Protection of Badgers Act 1992:** Protects badgers from cruelty including injury, killing and disturbance
- 24.2.6 **Birds Directive 1979:** Establishes a comprehensive network of Special Protection Areas (SPA) and bans activities that directly threaten birds.
- 24.2.7 **Habitats Directive 1992, Conservation of Habitats and Species Regulations 2010:** Protects species and habitats and gives protection to Special Areas of Conservation (SAC) which form part of the Natura 2000 network.

- 24.2.8 **EU Water Framework Directive (WFD) 2000:** Aims to enhance the status and prevent further deterioration of aquatic ecosystems and to reduce pollution of water bodies. It will replace the Freshwater Fish Directive by the end of 2013
- 24.2.9 **UK Marine and Coastal Access Act 2009:** Provides powers for licensing and management of migratory and freshwater fisheries as well as introducing a new system of marine planning and protection.
- 24.2.10 **Salmon and Freshwater Fisheries Act 1975:** Provides a legislative framework within which salmon and freshwater fisheries in England are regulated. The Act controls the times and permissible methods for taking or destroying fish, and the mechanisms by which the passage of fish may be obstructed.
- 24.2.11 **EC Directive on Quality of Freshwaters Needing Protection or Improvement to Support Fish Life 1978:** Protects and aims to improve the quality of freshwaters which support, or which, if pollution were reduced or eliminated, would become capable of supporting, fish life. The Directive has been implemented by the Surface Waters (Fish Life) Classification Regulations 1997 made under Section 82 of the Water Resources Act 1991.
- 24.2.12 **Eels (England and Wales) Regulations 2009:** Requires the establishment of eel management plans at a river basin scale, with the objective of restoring populations through various measures including habitat improvement.
- 24.2.13 **Hedgerow Regulations 1997:** Provides criteria for identifying “Important” hedgerows and provisions for their protection.

National Policy Context

- 24.2.14 National Policy Statements (NPS) provide the primary basis on which the Secretary of State is required to make its decisions. The specific assessment requirements for historic environment are set out below.
- 24.2.15 The overarching NPS for Energy (EN-1) (July 2011) sets out in Section 5.3 policy in relation to energy developments and biodiversity and geological conservation.
- 24.2.16 Section 5.3.3 of the NPS states that: *“Where the development is subject to Environmental Impact Assessment (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”*.
- 24.2.17 In addition, section 5.3.4 of EN-1 states: *“The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests”*.

National Planning Policy Framework (NPPF)

- 24.2.18 The assessment has been undertaken in accordance with the NPPF, which outlines Government policy on the treatment of the historic environment (including both undesignated and designated sites) within the local planning process.
- 24.2.19 The NPPF establishes a number of core land use planning principles that should underpin both plan making and decision taking, including contributing to conserving and enhancing the natural environment.
- 24.2.20 The relevant section of the NPPF (Section 11) is entitled – ‘Conserving and enhancing the natural environment’, and it states that the planning system should contribute to and enhance the natural and local environment through the following measures:
- Protecting and enhancing valued landscapes, geological conservation interests and soils;
 - Recognising the wider benefits of ecosystem services;
 - Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; and
 - Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.
- 24.2.21 The South East Regional Spatial Strategy 2006 - 2026 provides the long term spatial planning framework designed to help achieve more sustainable development in the South East, protecting the environment and combating climate change.
- 24.2.22 West Sussex Structure Plan 2001–2016: Policy ERA2 (Nature Conservation) remains West Sussex County Council’s (WSCC) strategic policy statement on development. It states that development should not be permitted unless the wide range of species, habitats and geological features of the county will be protected. Particular importance should be paid to features of national and international significance.

24.2.23 Local Development Framework - The Planning and Compulsory Purchase Act 2004 introduced a requirement for all Local Planning Authorities in England to prepare a Local Development Framework (LDF) for their area to replace Local Plans. The following Development Plan Documents (DPDs) have relevance for the proposed cable route as they contain strategy for protecting the natural environment:

- Adur District Local Plan;
- Worthing Core Strategy (Strategic Objective 1 and Policy 13);
- Horsham Core Strategy (Policy CP1);
- Horsham General Development Control Policies (Policy DC 5);
- Mid-Sussex Local Plan (Policy C5); and
- The South Downs National Park Authority Local Development Framework (in preparation).

24.2.24 Local Biodiversity Action Plans (LBAPs), the UK's response to the Convention on Biological Diversity 1992 The UKBAP (UK Biodiversity Action Plan) describes the UK's biological resources and sets out a national strategy for the conservation of biodiversity. This is addressed at the local level by the production of LBAPs. These address biodiversity issues specific to particular areas within the UK. The Sussex Biodiversity Partnership currently has 18 Habitat Action Plans (HAPs) in line with the England Biodiversity Strategy and the South East Biodiversity Strategy, which are focused on integrated delivery of habitat and species needs within landscapes. As the focus is on habitat, there are currently no Species Action Plans (SAPs). The Brighton & Hove draft Local Biodiversity Action Plan is currently at a consultation stage. It lists 18 SAPs and 15 HAPs which are important to the area to conserve. There are also five Biodiversity Opportunity Areas highlighted along the proposed cable route.

24.2.25 Natural Environment White Paper 2011: The Natural Environment White Paper sets out the Government's vision for the natural environment over the next 50 years. It outlines practical measures to protect natural areas, grow green economy and reconnect people with nature

24.2.26 Nature Improvement Areas (NIAs), Defra's response to the Natural Environment White Paper. The Natural Environment White Paper commits Government to assist partnerships of local authorities, local communities and landowners, the private sector and conservation organisations to establish new Nature Improvement Areas. The South Downs Way Ahead has been designated as a NIA as of 1 April 2012. There are a number of aims for NIAs including enlarging and enhancing existing wildlife sites, improving ecological connectivity and/or creating new sites.

24.3 Assessment Methodology

Establishment of Baseline Environment

Desk Based Assessment

- 24.3.1 Information on statutory and non-statutory sites, notable species and other details of relevance to the Onshore Project were requested from Sussex Biodiversity Record Centre in July 2010. The initial search area covered a 2km buffer around the proposed cable route.
- 24.3.2 Additional bat records were requested in May 2011 for a 5km buffer around the proposed cable route as it is within the known range of both the *Myotis bechsteinii* (Bechstein's) and *Barbastella barbastellus* (Barbastelle) bat species. Additional sources on the Internet such as the Multi-Agency Geographic Information for the Countryside (MAGIC) and Google Maps were also used.
- 24.3.3 Ecological networks were examined in September 2012 using data collected in the field during the 2011/2012 ecological surveys and supplemented by desktop information including the Natural England Ancient Woodland Inventory, the Ancient Woodland data set from Sussex Biodiversity Records Centre (as supplied in February 2011), and Natural England's Woodland BAP Priority Habitat inventory.

Scoping

- 24.3.4 As part of the scoping phase of the EIA, a Scoping Report (E.ON/RSK, 2010) was prepared to set out the proposed approach to EIA in respect of the proposed development, including the identification of assessment methodologies for each of the EIA topic areas to be assessed. The Scoping Report was submitted to the Infrastructure Planning Commission (IPC) in September 2010. A Scoping Opinion (IPC, 2010) was received from the IPC in October 2010 incorporating comments from a wide range of consultees. A copy of the Scoping Report and Scoping Opinion including consultee comments are included in Appendix 5.1 and 5.2.
- 24.3.5 The information and advice received during the scoping process with regard to ecology is summarised in Table 24-1.

Table 24-1: Relevant Scoping Responses

Date	Consultee	Summary of Issues	Sections Where Addressed
11/10/10	Adur District Council	Contact Sussex Biodiversity Record Centre to obtain accurate and up to date sites' data particularly for ancient woodland and Sites of Nature Conservation Importance (SNCI).	Existing data from the record centre are discussed throughout Section 24.4. All survey data is provided in the supporting technical reports.
		Append all survey data current and historical to the ES.	
		Provide a clear graphic indication of the cable route options being considered.	See Section 2b Project Description (onshore) and Section 3 (Alternatives).
		Detail all methodologies, mitigation and avoidance measures that will minimise ecological damage onshore and offshore.	The assessment methodology is detailed in Section 24.3. Individual survey methodologies followed are provided in full in the supporting technical reports. All mitigation and enhancement measures proposed are detailed in Section 24.6.
		Give a clear indication that all opportunities to provide ecological enhancement have been taken.	
		Append all communication with the Environment Agency(EA), Natural England (NE), etc..	All communication with statutory and non-statutory consultees is summarised within this table or the Consultation Report accompanying the Development Consent Order (DCO) application
11/10/10	East Sussex County Council (ESCC)	Give a clear description of how the easement for the cable will look and be expected to be maintained.	See Section 2b Project Description (onshore).
		WSCC and the South Downs National Park Planning Authority should be advised to seek compensation payments as a contribution to the conservation and enhancement of the South Downs landscape which would be affected by the works. Even though these are temporary in nature; planning policy requires that this type of disturbance in protected landscape should be compensated for.	An assessment of the impact to the National Park has been undertaken and the results and proposed mitigation are presented in Section 24.5 and Section 24.6.

Date	Consultee	Summary of Issues	Sections Where Addressed
		Locally designated sites are also important and are valuable for their individual wildlife interest, and the level of connectivity they provide across the wider environment. It is vitally important to avoid damage to such areas. Where such damage is unavoidable, appropriate mitigation strategies should be formulated to reduce/negate the impact of such activities.	An assessment of the impact to local wildlife sites has been undertaken and the results and proposed mitigation are presented in Section 24.5 and Section 24.6.
08/10/10	Environment Agency (EA)	The assessment methodology should cover likely impacts (construction and operational) on water and wetland habitats on site and within the surrounding area, including potential impacts on the existing hydrology.	Potential impacts to watercourses and wetland habitats are considered in Section 24.5.
		Detailed, up-to-date ecological surveys (habitats and species) of the development site should be undertaken at an appropriate time of year by a suitably qualified ecologist.	An outline of ecological surveys undertaken for the proposed cable route is provided in Section 24.3.
		Expect to see justification and at least like for like compensation for any wetland habitat/feature loss (and terrestrial habitat for wetland species e.g. Great Crested Newt). If mitigation is required it is important to assess how effective any measures are likely to be There could also be potential for off site enhancements as mitigation for any impacts arising from the development	All mitigation and enhancement measures proposed are detailed in Section 24.6
		Requested to be included in early consultations to define the scope of detailed surveys for habitats and species especially those of a wet nature	The EA was invited to comment on the scope of ecological surveys in March 2010, see summary of response below.
29/03/11	Environment Agency	(The scope of the onshore ecological surveys was discussed and a summary document was emailed to the EA on 16/03/11). EA confirmed it is happy with the detail of the surveys and requested that the biodiversity data should be provided to the local records centre.	The assessment methodology is detailed in Section 24.3. Individual survey methodologies followed are provided in full in the supporting technical reports.
16/09/10	Lancing Parish Council	There is a SNCI within the parish at Widewater. This is a protected area of importance for wildlife at a county scale, adopted by the Adur District Council for planning purposes and identified in the local development plan.	This site will not be directly affected by the proposed cable route and is therefore not included in the current assessment.

Date	Consultee	Summary of Issues	Sections Where Addressed
12/10/10	Natural England (NE)	The development site is within/adjacent to the following designated nature conservation site[s]: • Adur Estuary SSSI; • Beeding Hill – Newtimber Hill SSSI; • Wolstonbury Hill SSSI; • South Downs National Park; and • Marine and Terrestrial SNCIs. The ES should include a full assessment of the direct and indirect effects of the development on the features of special interest within this/these site[s] and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects.	An assessment of the impact on designated nature conservation sites has been undertaken and the results and proposed mitigation are presented in Section 24.5 and Section 24.6.
		There should be a separate section of the ES to address impacts upon European and Ramsar sites entitled “Information for Appropriate Assessment”.	There are no onshore European and/or Ramsar sites impacted by the proposed cable route.
		Information on how watercourses will be crossed should be supplied in the EIA.	Mitigation measures for watercourses are detailed in Section 24.6.
		Local wildlife sites are identified by the county ecologist/local wildlife trust and are of county importance for wildlife. The ES should therefore include an assessment of the likely impacts on the wildlife interests of these sites[s]. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures.	An assessment of the impact to local wildlife sites has been undertaken and the results and proposed mitigation are presented in Section 24.5 and Section 24.6.

Date	Consultee	Summary of Issues	Sections Where Addressed
		Surveys for protected species (including, for example, great crested newts, reptiles, water voles, badgers and bats) should be carried out within the area affected by the development. If any protected species are found the ES should include details of: • The species concerned; • The population level at the site affected by the proposal; • The direct and indirect effects of the development upon that species; • Full details of any mitigation or compensation that might be required; and • Whether the impact is acceptable and/or licensable. To provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out by suitably qualified and, where necessary, licensed consultants and should be planned well in advance to ensure that they are conducted during the appropriate season(s).	An outline of ecological surveys undertaken for the proposed cable route is provided in Section 24.3. This included protected species and botanical surveys which were conducted at appropriate times of the year by suitably qualified and, where necessary, licensed consultants.
		A habitat survey (analogous to Phase 2) should be carried out on the sites that may be affected by landfall, substations and other infrastructure, including cable routing on land, in order to identify any important habitats present.	The baseline environment including the habitats and species present is described in Section 24.4.
		In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year to establish whether any scarce or priority species are present. The ES should include details of: • Any historical data for the site affected by the proposal (e.g. from previous surveys); • Additional surveys carried out as part of this proposal; • The habitats and species present; • The status of these habitats and species (e.g. whether BAP Priority Habitat); • The direct and indirect effects of the development upon those habitats and species; and • Full details of any mitigation or compensation that may be required	An assessment of the direct and indirect effects of the proposed cable route on those habitats and species present is provided in Section 24.5.
		The development should avoid adversely impacting the most important wildlife areas and should, if possible, provide opportunities for overall wildlife gain.	All mitigation and enhancement measures proposed are detailed in Section 24.6.

Date	Consultee	Summary of Issues	Sections Where Addressed
16/03/11	Natural England	(The scope of the onshore ecological surveys was discussed and a summary document was emailed to WSCC on 16/03/11) NE confirmed verbally that it was happy for the county ecologist to comment on the survey scope and did not wish to review the document	N/A
12/10/10	West Sussex County Council	The cable corridor polygon as shown in the scoping report contains a large number of ecologically sensitive areas. WSCC has recently updated and added to the West Sussex SNCI list.	An assessment of the impact to local wildlife sites has been undertaken and the results and proposed mitigation are presented in Section 24.5 and Section 24.6.
		The ancient woodland data used for the scoping report appears out of date. Following the 2010 review of the ancient woodland resource many more have been identified. Please be aware that there are two ancient woodlands to the north and south of the Bolney substation. A trench and permanent easement through ancient woodland and some types of SNCI will be resisted (ref: PPS9 and local policy). The trench and easement will be expected to accord with BS 5837:2005.	A copy of the updated ancient woodland data was requested and the current assessment is based on this information. An assessment of the impact to ancient woodland has been undertaken and the results and proposed mitigation are presented in Section 24.5 and Section 24.6.
		Contact Sussex Biodiversity Record Centre to obtain accurate and up to date sites' data particularly for ancient woodland and SNCIs.	Data from the record centre are discussed throughout Section 24.4.
		Append all survey data current and historical to ES.	All survey data is provided in the supporting technical reports.
		Provide a clear graphic indication of the cable route options being considered.	See Section 2b Project Description (onshore) and Section 3 (Alternatives).
		Detail all methodologies, mitigation and avoidance measures that will minimise ecological damage onshore and offshore.	The assessment methodology is detailed in Section 24.3. Individual survey methods are provided in full in the supporting technical reports.

Date	Consultee	Summary of Issues	Sections Where Addressed
		Give a clear indication that all opportunities to provide ecological enhancement have been taken.	All mitigation and enhancement measures proposed are detailed in Section 24.6.
		Append all communication with the EA, NE, etc.	All communication with statutory and non-statutory consultees is summarised in this table or in the Consultation Report accompanying the DCO application
		Give a clear description of how the easement for the cable will look and be expected to be maintained.	See Section 2b Project Description (onshore).
10/06/11	West Sussex County Council	(The scope of the onshore ecological surveys was discussed and a summary document was emailed to WSCC on 16/03/11) WSCC ecologist confirmed via email his agreement with the proposed survey methodology changes.	The assessment methodology is detailed in Section 24.3. Individual survey methods are provided in full in the supporting technical reports.
15/4/11	West Sussex County Council	(Further discussions were undertaken regarding the bat survey methodology) WSCC, in discussion with NE, suggest that Category 2 features of trees (in addition to Category 3 features) could be suitable for small maternity colonies and therefore if it is thought that a tree has the potential to house a maternity roost then these trees should also be subject to further surveys.	
23/5/11	West Sussex County Council	WSCC confirm that the proposed assessment approach for Bechstein's fits well with the Bechstein's project methodology and therefore have no objection to moving forward on that basis.	
10/06/11	West Sussex County Council	The proposal to climb or re-climb all features in trees definitely scheduled for removal (because bats could have moved into them between tree climbing surveys this summer and construction) but that the only other trees we would re-climb would be those ones where we found evidence of bats this summer (in order to inform any Europe Projected Species, (EPS) licences required) is acceptable from WSCC perspective	

Date	Consultee	Summary of Issues	Sections Where Addressed
08/11/11	Ouse and Adur River Trust (OART)	We would bring to your attention that, in addition to the main stem of the Adur its very minor tributaries may be of high conservation value, not least because they often comprise very significant spawning/juvenile habitat for sea trout. We would wish to see all river/stream crossings considered as potentially sensitive sites; we presume that consideration would thus be given to employing directional drilling as opposed to a more conventional wet or dry stream crossing. Care would need to be taken in respect of stream crossings so as not to adversely affect their hydro-morphology. It may be possible, in conjunction with a cable crossing, to improve hydro-morphology at the crossing site or elsewhere, e.g. by the creation of gravel riffles which could comprise additional spawning habitat. We would also bring to your attention the potential for run-off from exposed soil during the cable works to enter watercourses and lead to a siltation of gravel riffles used by sea trout as spawning habitat. We would also raise the issue that extant baseline data from the EA may not be adequate to determine the sensitivity of particular minor watercourses and additional surveys, at an appropriate time of year, may thus be required to determine baseline condition.	Mitigation measures for watercourses are detailed in Section 24.6. A request has also been made to the OART for their survey data to help assess the need for further surveys.

- 24.3.6 The scope of the assessment was modified accordingly to take account of the above consultee responses and the opinions of the IPC, the findings of which were reported in the Draft ES.
- 24.3.7 As detailed in Section 5 – EIA Methodology, an extensive programme of engagement has been undertaken with regard to the Project; details of which are provided in the Consultation Report (which accompanies the DCO application). This included publication of the Draft ES as part of the Section 42 and Section 48 consultation.
- 24.3.8 Following a review of consultee feedback on the Draft ES, the following modifications were made to the Project and overall assessment scope:
- Updating the baseline sections to incorporate new landscape-scale initiatives such as Biodiversity Opportunity Areas and the proposed UNESCO (United Nations Educational, Scientific and Cultural Organisation) Biosphere area;
 - Clarification on the potential impact to aged and veteran trees and ancient woodland;
 - Ecological network survey;
 - Reviewing historic mapping to identify historically important hedgerows;
 - Updates on additional bird species present along the proposed route;
 - Clarification on the potential impact to non-statutory nature conservation sites; and
 - Adding a further column to the residual impact table detailing the temporary impact duration as <1 year, 1-2 years or 2-5 years.
- 24.3.9 Full details of the consultation process and associated outcomes are documented in Document 5.1 [Consultation Report].

Ecological Surveys

- 24.3.10 Ecological scoping surveys were undertaken on the proposed cable route in December 2010 and March 2011 by RSK. The surveys comprised an animal walkover (in December 2010) to assess the suitability of the habitats to support legally protected animals and notable species, and an extended Phase 1 Habitat Survey (in March 2011) to identify habitats of conservation value. Both surveys identified where further survey effort was required.
- 24.3.11 The requirement for further surveys and recommended survey methodologies was outlined in the Scoping Report (September 2010). As the Scoping Report was submitted prior to any Phase 1 surveys taking place the recommended surveys outlined in the Scoping Report were based on professional judgement, knowledge of the area and general habitats, and experience of similar schemes.

- 24.3.12 Following the scoping report consultation responses and the results of the desk-based assessment and animal walkover, some revisions to the survey scope and methods were required. These are outlined in the Ecological Scope of Works document (RSK March 2011) provided in Appendix 24.1. This document was issued to NE, EA and the WSCC ecologist in March 2011 for comment. All parties responded to say that they were in agreement with the survey scope or in the case of NE, content for the WSCC ecologist to respond on their behalf.
- 24.3.13 A full list of agreed Phase 2 ecological surveys carried out on the proposed cable route between March and October 2011 is provided in Table 24-2. Detailed accounts of survey methodologies are provided in the appropriate technical reports provided in Appendix 24.2 to 24.10.
- 24.3.14 Installation of the cable will require a working width no wider than 30m (except at the locations where horizontal directional drill (HDD) is proposed), comprising 15m for the cable easement and 15m for additional areas for storage of excavated material and access along the cable trench. The cable easement will not necessarily be central to the working width. Therefore, the Development Area generally encompasses a working width of 40m along the cable route. For the ecological surveys, a corridor of 65m was surveyed. A wider corridor surveyed in areas where a final route had not been confirmed or to align with best practice guidelines. For badger and bat-roost surveys an additional 30m either side of the 65m survey corridor was surveyed to take into consideration potential disturbance impacts (125m in total). The extended Phase 1 Habitat Survey also covered an additional 30m either side of the survey corridor to allow for a wider picture to be obtained and to help inform any potential route alterations.
- 24.3.15 Surveys were carried out at appropriate times of the year by suitably experienced and, where necessary, licensed ecologists.

Table 24-2: Detailed (Phase 2) Ecological Surveys Undertaken for the Proposed Cable Route

Species/Habitat	Description	Survey Period
National Vegetation Classification (NVC) Surveys	Focused on potentially valuable botanical sites identified during the Phase 1 survey including calcicolous grassland, unimproved neutral grassland, marshy grassland, woodland and coastal habitats. Habitats at these sites were described using the methodology of the NVC and detailed lists of vascular plants and bryophytes were compiled.	May–June 2011
Hedgerow Survey	Hedges were assessed against wildlife and landscape criteria in the Hedgerow Regulations 1997 to identify ‘important’ hedgerows.	May 2011
Water bodies	All river and stream crossings and most ditches were selected for further survey, which involved detailed inspection of bank-side, marginal and aquatic vegetation upstream and downstream of the crossing points, and the compilation of species lists.	May–June 2011

Species/Habitat	Description	Survey Period
Invasive Plant Survey	Locations of invasive plant species such as <i>Fallopia japonica</i> (Japanese knotweed) were recorded and location maps produced.	March–June 2011
Badger	Locations of setts and foraging activity were recorded along the entire survey corridor including a 30m disturbance buffer from the edge of works. Setts were accurately mapped and assessed.	February, March and August 2011
Bat Tree Assessment	All mature trees suitable for roosting bats along the entire survey corridor were inspected from the ground using binoculars to identify any features that might be suitable for roosting bats. All trees were graded according to their potential to support roosting bats, tagged and their location marked on maps. There are no buildings or built structures within the survey corridor, and therefore there is no potential to support roosting bats in the survey corridor.	February–August 2011
Bat Tree Inspections	Trees identified as having features with high potential for roosting bats were climbed for full inspection. The trees were climbed using ladders, ropes and harnesses and features examined in detail for evidence of bats with the aim of identifying any bat roosts along the route.	July–September 2011
Bat Activity Survey	Activity surveys were undertaken along linear features suitable for foraging and commuting bats, crossed by the proposed cable route. A combination of static detectors and manual surveys were used.	July, August and September 2011
Dormouse	Dormouse tubes and boxes were positioned in suitable habitat crossed by the proposed cable route and checked for nests over five visits between July and October.	July–October 2011
Great Crested Newt (GCN)	Water bodies were identified within a 250m buffer of the proposed cable route and assessed for their potential to support GCN. Presence/absence surveys were undertaken at all suitable water bodies followed by population assessment surveys if GCN were found to be present.	March–June 2011
Otter	Surveys concentrated in areas 100m upstream and 100m downstream of crossing points on all suitable watercourses. The watercourses were surveyed for signs of Otter including footprints (padding), droppings (spraints), feeding evidence, slides, paths and holts or lying-up places.	May, June and September 2011
Water Vole	Surveys concentrated in areas 100m upstream and 100m downstream of pipeline crossing points on all suitable watercourses and involved the systematic searching for Water Vole field signs including feeding signs, latrines, burrows, footprints, runways, food piles and actual sightings.	May, June and September 2011
Nesting Birds	Incidental sightings of Schedule 1 species were recorded during all protected species surveys. Sightings and evidence of Barn Owl were specifically noted during bat tree roost inspections.	March–October 2011
Reptiles	Protected species presence/absence surveys were undertaken using artificial refuges placed in suitable habitat and checked on five separate occasions between May and September.	May–September 2011

Species/Habitat	Description	Survey Period
Terrestrial Invertebrates	Surveys were undertaken for specific target butterfly species (Adonis Blue, Chalkhill Blue, Brown Hairstreak, Duke of Burgundy, Pearl-bordered Fritillary, Small Blue and White-letter Hairstreak) in combination with general sampling for all terrestrial invertebrate groups focusing on high value habitats chosen along the proposed cable route.	May–September 2011
Aquatic Invertebrates	One-off spring or autumn samples were taken from watercourses along the proposed cable route at proposed crossing points and analysed in the laboratory.	May and September 2011

24.3.16 In addition to the detailed surveys listed above, an extended Phase 1 Habitat Survey and animal walkover was undertaken at the proposed substation site located in the vicinity of the existing Bolney substation. This area was not identified until September 2011 and could not be accessed for assessment until October 2011, when a site visit was made to enable appraisal of the nature conservation value of the habitats involved. The results of this survey are shown in Figure 24.2 and discussed, where appropriate, within this section.

24.3.17 A full list of detailed (Phase 2) ecological surveys carried out on the proposed substation area between March and July 2012 is provided in Table 24-3. Detailed accounts of survey methodologies are provided in the substation technical report in Appendix 24.11.

Table 24-3: Detailed (Phase 2) Ecological Surveys Undertaken for the Proposed Substation

Species/Habitat	Description	Survey Period
National Vegetation Classification (NVC) Surveys	Focused on potentially valuable botanical sites identified during the Phase 1 Habitat Survey including woodland and unimproved neutral grassland. Habitats at these sites were described using the methodology of the NVC and detailed lists of vascular plants and bryophytes were compiled.	April 2012
Hedgerow Survey	Hedges were assessed against wildlife and landscape criteria in the Hedgerow Regulations 1997 to identify 'important' hedgerows.	April 2012
Tree Survey	Trees were recorded and categorised in respect to their suitability for retention using criteria outlined in BS5837 – Trees in Relation to Construction – Recommendations 2005.	March 2012
Badger	Locations of setts and foraging activity were recorded within the substation footprint and 30m outside this footprint boundary. Any setts found were accurately mapped and assessed.	March 2012

Species/ Habitat	Description	Survey Period
Bat Tree Assessment	All mature trees suitable for roosting bats within the substation footprint were inspected from the ground using binoculars to identify any features that might be suitable for roosting bats. All trees were graded according to their potential to support roosting bats, tagged and their location marked on maps.	March 2012
Bat Tree Inspections	Trees identified as having features with high potential for roosting bats were climbed for full inspection. The trees were climbed using ladders, ropes and harnesses and features examined in detail for evidence of bats with the aim of identifying any bat roosts along the route.	May 2012
Great Crested Newt (GCN)	Water bodies were identified within a 500m buffer of the substation footprint and assessed for their potential to support GCN. Presence/absence surveys were undertaken on all suitable water bodies followed by population assessment surveys if GCN were found to be present.	March–June 2012
Reptiles	Protected species presence/absence surveys were undertaken using artificial refuges placed in suitable habitat and checked on seven occasions, due to the permanent nature of the substation development.	May–July 2012
Terrestrial Invertebrates	A scoping survey was undertaken within the substation footprint in order to make an assessment of the invertebrate interest.	May 2012

Identification and Assessment of Impacts and Mitigation Measures

24.3.18 The first stage of an ecological impact assessment (EcIA), following the ‘Guidelines for Ecological Impact Assessment’ set out by the Institute of Ecology and Environmental Management (IEEM 2006), is ‘determining value’ of ecological features or ‘receptors’. The IEEM guidelines places the emphasis on identifying different aspects of ecological value including designations, biodiversity value, potential value, secondary or supporting value, social value, economic value, legal protection and multi-functional features. These values are applied to the receptors within a defined geographical context and examples can be seen in Table 24-4.

Table 24-4: Receptor Sensitivity Examples

Receptor Value	Examples
International (i.e. Europe)	An internationally designated site or candidate site or an area which the statutory nature conservation organisation has determined meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. A European protected species listed in the Conservation of Habitats and Species Regulations 2010.

Receptor Value	Examples
National (i.e. England)	A nationally designated site or a discrete area, which the statutory nature conservation organisation has determined meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. A viable area of a Priority Habitat or smaller areas of such habitat which are essential to maintain the viability of a larger whole. A regularly occurring, nationally significant population/number of any internationally important species.
Regional (i.e. South East)	Viable areas of key habitat identified in the regional BAP, or smaller areas of such habitat that are essential to maintain the viability of a larger whole. Viable areas of key habitat identified as being of regional value in the appropriate Natural Area profile. Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a regional authority BAP or relevant Natural Area on account of its regional rarity or localisation. A regularly occurring, locally significant number of a species identified as important on a regional basis. Any regularly occurring population of a nationally important species which is threatened or rare in the region.
County (i.e. West Sussex)	County council/unitary authority designated sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including LNRs selected on defined ecological criteria and Wildlife Trust sites. Viable areas of habitat identified in a county BAP. A regularly occurring, locally significant number of a species identified as important on a county/metropolitan basis. Semi-natural woodland greater than 0.5ha which is considered to be in 'good condition'.
District (i.e. Mid Sussex/ Worthing)	Semi-natural woodland greater than 0.25ha which is considered to be in 'good condition' or greater than 0.5ha in unfavourable condition. Network of inter-connected hedgerows including some species-rich hedgerows. Individual important hedgerows or other ancient-countryside linear features. Viable areas of habitat identified in a sub-county (district/borough) BAP. Any regularly occurring population of a nationally important species which is not threatened or rare in the region or county. Sites/features that are scarce within the district/borough or which appreciably enrich the district/borough habitat resource. Other features identified as wildlife corridors or migration routes.

Receptor Value	Examples
Local	Semi-natural woodland smaller than 0.25 ha. Diverse and/or ecologically valuable hedgerows. Diverse and/or ecologically valuable grassland. Habitat included in an agri-environment scheme but not otherwise containing species or habitats listed above. Common species legally protected primarily for reasons of animal welfare (badger, reptiles). Established semi-natural or artificial habitats of limited ecological value when assessed in isolation but which offer a range of opportunities for widespread and commonly occurring species within the wider landscape.
Site	Features of value to the immediate area only.

24.3.19 The next stage of an EclA is to predict and characterise the likely change and impact on the ecological receptors identified. It is necessary to consider all of the following parameters;

- Whether the change is **positive** or **negative**;
- The **magnitude** or severity of the change;
- The **extent** of the area subject to a predicted impact;
- The **duration** the impact is expected to last prior to recover or replacement of the resource or feature;
- Whether the impacts are **reversible**, with recovery through natural or spontaneous regeneration, or through the implementation of mitigation measures or irreversible, when no recovery is possible within a reasonable timescale or there is no intention to reverse the impact; and
- The **timing and frequency** of the impact, i.e. conflicting with critical seasons or increasing impact through repetition.

24.3.20 The IEEM Guidelines for EclA also stress consideration of the likelihood that 'a change/activity will occur and also the degree of confidence in the assessment of the impact on ecological structure and function'. Likelihood is then specified using the following terms:

- Certain (95% probability or higher);
- Probable (50-94% probability);
- Unlikely (5-49% probability); or
- Extremely unlikely (less than 5% probability).

Significance of Residual Effects

- 24.3.21 An assessment has been made of the significance of residual effects, i.e. the significance of the effects that are predicted to remain after the implementation of committed mitigation measures.
- 24.3.22 Significance has been assessed solely on an ecological basis. There are two key aspects to this.
- 24.3.23 Firstly, what constitutes a significant ecological impact is determined in relation to the concept of 'integrity' (with regard to the parameters listed above in paragraph 24.3.19).
- 24.3.24 Secondly, it is always stated in relation to a geographical context, i.e. whether the receptor is internationally, nationally, locally, etc. important. Thus an impact is described as significant if it affects the *integrity* of an ecological receptor, integrity being defined as 'the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified'.
- 24.3.25 The impact is then significant at up to the level at which the ecological receptor has value, e.g. national for a SSSI. An impact that does not affect the integrity of a receptor may still be significant at some geographical level below that at which the receptor was deemed to be valuable, e.g. loss of common birds may not affect the integrity of an SPA valued at international level, but it may still be a significant impact at the local level.

Uncertainty and Technical Difficulties Encountered

- 24.3.26 Access was denied by landowners for a 1km section of the route between Horn Lane and the A281 road, although it was included in the animal walkover in December 2010 so some information is available, although this is limited.
- 24.3.27 To facilitate the construction of the onshore cable route, further areas of temporary land take will be required (in addition to those areas assessed within this section for site compounds, material storage, temporary access tracks etc. Although indicative locations have been discussed these are likely to be altered and have not therefore been included within this assessment.
- 24.3.28 Due to the time delay between the cable trenching/duct laying and the cable pulling (estimated to be approximately 6 to 12 months), in certain locations, some of the haul roads and working width fencing will need to remain in place between the trenching and pulling operations. It is not currently known which areas will be utilised for the pulling operations; therefore, the assessment has focused on the impacts associated with the construction and installation of the cable ducting only.

24.3.29 A minor route change occurred subsequent to the completion of the ecological surveys to accommodate the 'Teville Stream Restoration Project'. An Extended Phase 1 Habitat Survey was carried out for this area in August 2012 to update the report and appraise the nature conservation value of the habitats involved. These results have been incorporated into this assessment.

24.4 Environmental Baseline

Biodiversity Action Plans

24.4.1 The UKBAP was published in June 2007 (Biodiversity Reporting and Information Group 2007) and includes 65 'Priority' HAPs, which are specific habitat types in 28 Broad Habitat types, 1,149 'Priority' SAPs, and nine 'Grouped' SAPs.

24.4.2 The following UKBAP Priority HAPs are of potential relevance to the proposed cable route:

- Arable Field Margins;
- Coastal Saltmarsh;
- Coastal Vegetated Shingle;
- Hedgerows;
- Lowland Mixed Deciduous Woodland;
- Lowland Meadows;
- Lowland Calcareous Grassland;
- Purple Moor Grass and Rush Pastures;
- Ponds; and
- Rivers.

24.4.3 The Sussex Biodiversity Partnership has the following additional local HAPs of potential relevance to the proposed cable route:

- Reedbeds;
- Woodland; and
- Urban.

24.4.4 The Brighton and Hove draft LBAPs currently in its consultation phase. Its lists the following additional local HAPs of potential relevance to the proposed cable route:

- Farmlands;
- Parks and Gardens; and
- Urban Commons.

24.4.5 The UKBAP and Brighton and Hove HAPs are discussed in the relevant species section below.

Landscape-scale Initiatives

Proposed Biosphere Reserve

24.4.6 UNESCO is developing a global network of 'Biosphere Reserves' whose aim is to promote a balanced relationship between people and nature. The Brighton & Hove and Lewes Downs Biosphere Partnership launched its bid for the South Downs between the River Adur and River Ouse (plus the urban area of Brighton & Hove) to become a Biosphere Reserve in May 2012. The proposed cable route crosses part of this area.

Biodiversity Opportunity Areas

24.4.7 The proposed cable route falls within the following Biodiversity Opportunity Areas (BOAs):

- North East Worthing Downs
- Central Downs Arun and Adur
- North Bramber Flood Plain
- Adur – Newtimber including Mill Hill
- Woods Mill Stream to Adur

24.4.8 BOAs are described as areas of opportunity for the restoration and creation of BAP habitats.

Nature Improvement Areas

24.4.9 The proposed cable route will also pass through approximately 8km of The South Downs Way Ahead NIA. One of the key objectives of the NIA is the maintenance, restoration and creation of chalk grassland on a landscape scale.

Statutory Designated Sites

24.4.10 A list of statutory sites within 5km of the proposed onshore cable route is given below. The sites are listed in order of closest proximity to the proposed cable route:

- South Downs National Park covers a vast area designated for its geological, ecological and landscape value;
- Beeding Hill to Newtimber Hill SSSI contains uncommon habitats, including south-east chalk grassland, Juniper scrub and Pedunculate Oak-Ash-Beech woodland. The site is important for invertebrates;
- Cissbury Ring SSSI is an ancient hill fort site and comprises unimproved chalk grassland, neutral grassland and scrub. The site is important for butterflies and wintering, breeding and migrant birds;
- Mill Hill LNR is a chalk grassland site important for its plant and butterfly diversity;
- Adur Estuary SSSI comprises intertidal mudflats and saltmarsh. The site is important for its wading bird populations;
- Tottington Wood LNR is ancient semi-natural broadleaved woodland situated in the village of Small Dole;
- Lancing Ring LNR comprises a dewpond, chalk pit and meadow. The site is important for reptiles and invertebrates;
- Horton Clay Pit SSSI is a site of geological importance with a steeply sloping exposure of undisturbed gault clay at the edge of the landfill site;
- Widewater Lagoon LNR comprises a saline lagoon and its banks. The site is important for birds and invertebrates;
- High Weald AONB is a large area of rolling hills, scattered farmsteads, small woodlands, irregular-shaped fields, open heaths and ancient route ways;
- Shoreham Beach LNR comprises a vegetated shingle beach with specialised shingle flora;
- Chanctonbury Hill SSSI lies on a steep chalk escarpment and comprises chalk grassland and a maple variant of the calcareous Pedunculate Oak-Ash-Beech woodland type. The site supports a rich community of breeding birds;
- Wolstonbury Hill SSSI comprises areas of chalk downland, which is rich in flowering plants, and woodland; and
- Benfield Hill LNR comprises south and east facing gentle and more steeply sloping areas which support chalk grassland and scrub.

24.4.11 The only statutory designated site crossed by the proposed cable route is the newly formed South Downs National Park. There is only one other site within 100m of the proposed cable route, namely Beeding Hill to Newtimber Hill SSSI.

South Downs National Park

- 24.4.12 The proposed cable route passes through approximately 14km of the South Downs National Park, see Figure 24.1. The National Park was designated in April 2011 and covers an area of approximately 1,600km².
- 24.4.13 Habitats which form part of the National Park's resource include chalk grassland, arable farmland, lowland heath, woodland, rivers and streams and coastal areas. The National Park also supports a wide range of fauna.

Beeding Hill to Newtimber Hill SSSI

- 24.4.14 The largest extent of this SSSI is situated on down land south of Poynings to the east of the proposed cable route. The closest point between the proposed Development Area and this part of the SSSI is 46m, just south of Truleigh Manor Farm.
- 24.4.15 There are also three small areas of the SSSI which are situated to the west of the proposed cable route between the A283 and just south of Upper Beeding. However, at their closest point these units are over 220m away.
- 24.4.16 The site is designated for its calcareous grassland of which 42% is in favourable condition and 58% is in unfavourable recovering condition.

Non-statutory Designated Sites

- 24.4.17 There are 83 non-statutory designated sites within the 2km search area, of which 12 are within 100m of the proposed cable route. These are listed below:
- Applesham Farm Bank SNCI – this site is crossed by the proposed cable route.
 - Old Erringham Farm Valley and Road Cutting, Shoreham-by-Sea SNCI – this site is crossed by the proposed cable route.
 - A283 Steyning Rd. Notable Verge (NV) – this site is crossed by the proposed cable route.
 - Paddock Wood Ancient Semi-Natural Woodland (ASNW) – this site is situated on the edge of the proposed working width.
 - Woodhouse Wood ASNW – this site is situated on the edge of the proposed working width.
 - Lower Cokeham reedbed and ditches, Lancing SNCI – this site is situated on the edge of the proposed working width.

- Steep Down, Lancing SNCI – this site is situated over 60m from the proposed cable route and it is designated for its unimproved chalk grassland and plant and butterfly species. There will be no direct impact on this site and it is unlikely that any species using the site will be impacted by the works as no chalk grassland will be affected in this area and therefore this site is not assessed any further within this section.
- River Adur Meadows, Shoreham-by-Sea SNCI – this site is situated to the north and south of the proposed working width. At its closest point it is over 60m away and lies between the River Adur and the A283. There will be no direct impact on this site and it is unlikely that any species using the site will be impacted by the works considering its distance away and close proximity to a busy main road.
- Two unnamed ASNW sites – one of which is situated on the edge of the proposed working width within Old Erringham Farm Valley and Road Cutting SNCI and the other is situated on the edge of the proposed working width near Woodmancote Wood.
- Shoreham Cement Works Regionally Important Geological / Geomorphological Site (RIGS) – this site is situated over 90m from the proposed cable route and it is designated predominantly for its geological interest. It is unlikely that any species using the site will be impacted by the works as they will be used to a high degree of disturbance and therefore this site is not assessed any further within this section.
- Gaster Pit RIGS – this site is situated over 70m from the proposed cable route and it is designated predominantly for its geological interest. The site was briefly investigated during the terrestrial invertebrate surveys but found to have low invertebrate interest. It is unlikely that any species using the site will be impacted by the works due to its distance from the working width and therefore this site is not assessed any further within this section.

Old Erringham Farm Valley and Road Cutting SNCI/A283 Steyning Road NV

- 24.4.18 These local sites share the same boundary where the proposed cable route crosses them and are therefore assessed together in this assessment. The site also includes an area of unnamed ASNW (approximately 3.78ha in size) which will also be assessed in combination with these sites.
- 24.4.19 Habitat includes a shallow valley which has rich grassland on its sides; an area of storm-damaged woodland with Ash, Sycamore, Beech, Horse Chestnut and young Elms, a road cutting, derelict ponds and a disused quarry.
- 24.4.20 A White-letter Hairstreak butterfly colony is also noted in the site citation as occurring on the Elms.

Applesham Farm Bank SNCI

- 24.4.21 This site is a curved, north-east-facing slope supporting areas of unimproved chalk grassland. It provides excellent habitat for invertebrates especially butterfly species of which 21 species have been recorded here.

Lower Cokeham reedbed and ditches SNCI

- 24.4.22 This site is an area of reedbed and tall fen which is crossed and bordered by wet ditches. It provides valuable roosting and nesting sites for a variety of birds and it has particular importance due to its setting located on the edge of an urban area.

Ancient Semi-Natural Woodland

- 24.4.23 An area of unnamed ASNW occurs in the Old Erringham Farm Valley and Road Cutting SNCI and will be dealt with in association with this site. Two areas of ASNW occur outside designated sites at Woodhouse Wood and Paddock Wood, see Figure 24.1 for locations. These are discussed in further detail in the Woodland, Scrub and Trees section below.
- 24.4.24 Woodhouse Wood is approximately 4.25ha and is situated to the west of the proposed cable route (outside of the working width) north-east of Henfield. Paddock Wood is approximately 2.6ha and is situated to just outside of the working width) slightly further north than Woodhouse Wood. Neither site is in the South Downs National Park.
- 24.4.25 These sites are isolated areas of woodland which are connected to the wider landscape through hedgerows, ditches and streams which border the expanse of farmland through this area of the route.
- 24.4.26 The ecological network survey identified a hedgerow and adjacent stream at *Target Note 160* that is crossed by the proposed cable route and which links two areas of ASNW, namely The Alders and Woodmancote Wood (which are not crossed and lie outside the survey area). Although the hedgerow is gappy in places and it is bisected by a farm track and public right of way, it does provide a continuous line of cover between the woods and had high numbers of bats foraging and commuting along its length during the 2011 bat activity surveys (see Section 24.4.51 for further details).

Woodland, Scrub and Trees*Semi-natural Woodland*

- 24.4.27 Full details of woodland types (and all the following habitat types discussed) can be found within the accompanying Botany Technical Report at Appendix 24.2, including NVC categories and species list where appropriate. A summary has been provided in the following sections. Features of interest are described in 'target notes', which are also numbered. Where target notes are used, please refer to Figure 24.2.

- 24.4.28 The route generally avoids areas of semi-natural woodland, though it does cross a narrow woodland copse at *Target Note 299*, the western section of which is designated as ASNW (the ASNW designation is outside the working width - see above). The route also passes close to designated ancient woodlands at *Target Notes 164* (Unnamed wood in Old Erringham Farm Valley and Road Cutting SNCI) and *182* (Woodhouse Wood).
- 24.4.29 Other smaller areas of semi-natural woodland occur within the route corridor including a narrow strip of woodland situated either side of a stream at *Target Note 141* and a narrow strip of woodland at *Target Note 277j* north-west of the proposed substation.
- 24.4.30 These woods have semi-natural structures and species compositions, and support several species in their field-layers considered to be ancient woodland indicator (AWI) plants in the south-east. Evidence from the botanical surveys suggests these long-established areas may be small but significant areas of ancient woodland which do not feature in the Natural England Ancient Woodland Inventory due to their size. While these two areas are small in extent, semi-natural woodland is a limited resource and a UK (Lowland Mixed Deciduous Woodland) and Sussex (Woodland) BAP Priority Habitat and, as such, they have local conservation value.
- 24.4.31 Plantation woodland is present along the route and is mostly of recent origin and low conservation priority.
- 24.4.32 Scrub has been assessed in terms of its individual importance and its importance in relation to the area where it occurs. Most areas of scrub are very ordinary examples of the habitat type however in a few cases the scrub is encroaching on more valuable habitats such as calcicolous grassland. Scrub with a woodland ground flora, found at *Target Note 139* is of higher value equivalent to that of semi-natural woodland.
- 24.4.33 Individual mature trees are frequently associated with hedges and other linear features crossed by the route, such as watercourses, and they occasionally occur scattered in fields. The majority of these open-grown trees on the route are of one species, *Quercus robur* (Pedunculate oak) although there is a noteworthy group of *Aesculus hippocastanum* (Horse-chestnut) at *Target Note 108* (Old Erringham Farm Valley and Road Cutting SNCI).
- 24.4.34 A retrospective aged and veteran tree assessment was undertaken in September 2012 using data collected in the field during the 2011/2012 ecological surveys and supplemented by field visits where required. It was concluded that although many of the individual mature trees along the route are over 100 years old, none are approaching aged or veteran status.
- 24.4.35 However mature broad-leaved trees are important landscape features with intrinsic ecological value that cannot be replaced in the short-term.

Hedgerows

24.4.36 Hedges are important as landscape features, habitats and wildlife corridors in the generally intensively farmed land crossed by the route. The northern half of the route in particular is densely hedged, and the hedges form a well-connected network with other hedges and woodlands, including several ancient woods in the surrounding area. Most of the hedges are only moderately species-rich in terms of shrub and field-layer species, but they typically support additional features such as standard trees and an adjacent ditch that increase their ecological value. It is likely that many of the hedges have ancient origins and 44 of the hedgerows surveyed qualify as 'important' based on ecological criteria in the Hedgerow Regulations 1997. This includes eight hedges recorded at the substation site. The UK and Sussex BAPs for hedges are primarily concerned with ancient and species-rich hedges such as these.

24.4.37 There are also a handful of species-poor hedges clearly of recent origin that have low ecological value.

24.4.38 The Hedgerow Regulations 1997 also state the importance of assessing the historic value of a hedgerow. 'Important' hedgerows encountered along the proposed cable route, (with reference to their historic importance only) are all Parish boundaries. These are shown on Figure 25.1 and detailed within the Section 25 (Archaeology and Cultural Heritage).

- RDX01/15 – 16 Sompting Civil Parish (CP) – Worthing District parish boundary;
- RDX04 (Lambleys Lane) Worthing District – Sompting CP parish boundary;
- RDX05/03 – 04 Sompting CP – Coombes CP parish boundary;
- RDX07/02 – 03 Adur District – Upper Beeding CP parish boundary (Plate 5);
- RDX10/10 Upper Beeding CP – Henfield CP parish boundary;
- RDX11/02 – 03 Henfield CP – Woodmancote CP parish boundary;
- RDX13 (Wineham Lane) Woodmancote CP – Twineham CP parish boundary; and
- RDX01/11 – RD02 Boundaries associated with HER sites (RSK ID 66 & 67).

Grassland

Agricultural Grassland

- 24.4.39 Improved and poor semi-improved grasslands are present throughout the route. They are typically very species-poor and have low ecological value.

Unimproved and Semi-improved Neutral Grassland

- 24.4.40 Grassland referable to the NVC type MG6 is fairly common in the UK, but it is rare on the cable route. The fields in question (*Target Notes 26, 35 and 42*, north of the railway) are moderately species-rich without containing any particularly uncommon species and, together with associated ditches and areas of marshy grassland, they have local nature conservation value. These fields adjoin Lower Cokeham SNCI to the east.
- 24.4.41 Rough, unimproved grassland at *Target Note 150* is referable to the NVC types MG5a and MG1e and it supports a handful of species usually associated with 'Old Meadows' such as *Centaurea debeauxii* (Chalk Knapweed) and *Silene silaus* (Pepper-saxifrage). It is an example of the UK and Sussex BAP Priority Habitat Lowland Meadows.
- 24.4.42 The best example of the UKBAP Priority Habitat - Lowland Meadows in the survey area is adjacent to the proposed substation area at *Target Note 277i*. It is herb-rich with large populations of *Anacamptis morio* (Green-winged Orchid) and *Ophioglossum vulgatum* (Adder's-tongue) and clearly benefits from favourable management.
- 24.4.43 Grassland at *Target Notes 50a, 50b, 52a, 100, 277 and 277e*, though semi-improved, also have the potential to become species-rich with appropriate long-term management. Therefore these areas have at least some nature conservation value.
- 24.4.44 Species-poor grassland along the route and referable to the NVC type MG1b is a ubiquitous, low-value habitat.

Calcicolous grassland

- 24.4.45 There are three discrete areas where the route passes through the South Downs in which calcicolous grassland has not been ploughed-up and converted to arable or improved grassland, specifically east of Lambleys Barn, at Old Erringham Farm Valley and Road Cutting SNCI and around Tottington Mount.

24.4.46 Lowland calcicolous grassland is a UK and Sussex BAP Priority Habitat due to the large-scale loss of habitat to intensive agriculture that has taken place in the South Downs and across the UK. Good examples of species-rich calcicolous grassland occur at Old Erringham Farm Valley and Road Cutting SNCI and Tottington Mount, and noteworthy plant species recorded from these sites – *Centaurea calcitrapa* (Red Star-thistle), *Phyteuma orbiculare* (Round-headed Rampion) and *Thesium humifusum* (Bastard-toadflax) – add to their already high nature conservation value. Calcicolous grassland at Tottington Mount has also been included on the recent chalk grassland habitat opportunity mapping prepared by the Sussex Biodiversity Record Centre for the South Downs National Park Authority (SDNPA).

24.4.47 Calcicolous grassland east of Lambleys Barn is in unfavourable condition, but is nevertheless of botanical interest and it has the potential to become species-rich in the long term if it is managed appropriately.

Marshy Grassland and Swamp

24.4.48 Marshy grassland is rare in the local context and adds to the overall diversity of habitats crossed by the route, even if the examples are generally species-poor. One example at *Target Note 27* (north of the railway) supports a much wider range of species and is associated with other habitats of botanical interest (described under unimproved and semi-improved neutral grassland). This area is situated outside of the proposed HDD working area. At *Target Note 162* (next to the Alders), the route crosses the corner of a larger area of marshy grassland containing *Carex paniculata* (Greater Tussock-sedge), *Cirsium dissectum* (Meadow Thistle) and *Molinia caerulea* (Purple Moor-grass) – species not recorded anywhere on the route itself. This area is an example of the UK BAP Priority Habitat Purple Moor Grass and Rush Pastures.

24.4.49 Swamp at *Target Note 32* is a high quality habitat and part of the Lower Cokeham SINC. This area is outside the proposed HDD working area.

Tall Herb and Fern

24.4.50 Tall herb vegetation of the kinds recorded from the route is ubiquitous in the UK and typically of low ecological value. This vegetation type will be assessed in conjunction with the broader habitat areas it is associated with.

Coastal Habitats

24.4.51 Coastal Vegetated Shingle is a UK and Sussex BAP Priority Habitat. The shingle at the landfall is heavily disturbed by vehicles and the public, and vegetation is restricted to a 10m strip containing mostly semi-ruderal species with a handful of coastal specialists. It is not a typical or high value example of the habitat type as it lacks a diversity of species associated with the coastal community type. However, it is still of botanical interest.

24.4.52 Coastal Saltmarsh is also a Priority Habitat in the UK and Sussex BAPs. On the route, saltmarsh is limited to very narrow strips along the banks of the River Adur.

Watercourses and Ponds

24.4.53 The most significant watercourse crossed by the cable is the River Adur. It is a large tidal river with narrow strips of saltmarsh along its banks, which therefore qualifies it under the UK BAP Priority Habitats for Rivers and Coastal Saltmarsh.

24.4.54 Smaller rivers and streams crossed by the route do not meet BAP criteria, though the best examples are perhaps of local interest. These include the more semi-natural watercourses supporting certain wetland vegetation types or adjacent areas of marshy grassland, or those with wooded banks. They are mostly eutrophic and none has any obvious chalk influence.

24.4.55 Many of the ditches crossed are small and support very ordinary examples of wetland vegetation and no aquatics. Large, wet ditches occur north of the railway (*Target Notes 25-44*) and west of the River Adur, most notably at *Target Note 95*. They support abundant aquatic vegetation and are of some value in the local context.

24.4.56 The wet ditches to the north of the railway are tributaries of the Teville Stream. The route of the Teville stream is due to change from its current position in this area as part of an EA WFD project, "The Teville Restoration Project". The project will involve creating a new river channel from the wet ditch at *Target Note 39*, connecting northwards to the dry ditch at *Target Note 45*.

24.4.57 Ponds are a UK BAP Priority Habitat. The temporary pond at *Target Note 25* is the best example, but most others are heavily shaded or artificial fishing ponds.

Other Habitats

Arable

24.4.58 Arable Field Margins is a UK and Sussex BAP Priority Habitat. However, arable plant assemblages crossed by the route are very ordinary examples and the only noteworthy species recorded was *Bromus secalinus* (Rye Brome), discussed in below in 'Notable Plant Species –Red List Species'.

Semi-urban Habitats

24.4.59 Semi-urban habitats recorded from the route such as amenity grassland and ornamental shrubs and trees are ordinary examples of widespread artificial habitats. One area of ephemeral/short perennial at *Target Note 12* contains a moderate range of common species, and at *Target Note 13* there is an area which appears to have been recently sown as a wildflower meadow, however this could be easily re-creatable due to its artificial and recent origin.

24.4.60 Urban Commons and Parks and Gardens are Habitats of Importance in the Brighton and Hove draft LBAP and Sussex Biodiversity Partnership has a local HAP for 'Urban' areas.

Notable Plant Species

Red List Species

- *Centaurea calcitrapa* (Red Star-thistle) is listed as 'Critical' in Cheffing & Farrell (2005) and 'Nationally Rare' in Stewart et al. (1994). It is also a UK BAP Priority Species and a Species of Importance in the Brighton and Hove draft LBAP, though it is doubtfully native. It is growing abundantly along a track in the Old Erringham Farm Valley and Road Cutting SNCI at *Target Note 103* entirely within the proposed working width; and
- *Bromus secalinus* (Rye Brome) is listed as 'Vulnerable' in Cheffing & Farrell (2005) and 'Nationally Scarce' in Stewart et al. (1994), though it is likely to be under-recorded. It was recorded from the margins of an arable field at *Target Note 108a*, and was also observed in several places off-route.

Nationally Scarce Species

24.4.61 Two further species are listed as 'Nationally Scarce' in Stewart et al. (1994).

- *Phyteuma orbiculare* (Round-headed Rampion) was recorded as occasional in calcicolous grassland at *Target Notes 111* – where it is largely confined to an exposed chalk slope outside the working width – and *111c*, and there are a few plants at *Target Note 69*. It is therefore likely that plants would be affected at *Target Note 111c* and possibly *69*. Hall (1980) lists it as common on the Downs; and
- *Thesium humifusum* (Bastard-toadflax) was recorded along the top of the chalk slope at *Target Note 106*, where it is unlikely to be affected by proposed works.

Other Noteworthy Species

- *Trifolium scabrum* (Rough Clover) is listed as 'Nationally Uncommon' in Stace (2010) because it occurs in less than 250 ten-kilometre grid-squares nationally (Preston et al., 2002). It is locally frequent on the shingle at *Target Note 1*.

Bryophytes

24.4.62 In general, the assemblages recorded are of widespread and common species. Bryophytes are therefore covered in combination with main habitat types and will not be dealt with separately any further in this assessment.

Invasive Species

24.4.63 The tall ruderal plants *Fallopia japonica* (Japanese Knotweed) and *Heracleum mantegazzianum* (Giant Hogweed) are present along the proposed cable route (see Figure 3 in the Botany Technical Report for exact locations). Japanese Knotweed was found within the disused allotments and scattered either side of the River Adur (including from one area in the Old Erringham Farm Valley and Road Cutting SNCI). Giant hogweed was found on the margins of arable fields between the railway at Sompting Bypass. These are invasive species listed on Schedule 9 of the WCA 1981. It is an offence to cause them to grow or spread in the wild.

24.4.64 *Impatiens glandulifera* (Himalayan Balsam) was not identified along the proposed cable route.

Badger

24.4.65 Two records of *Meles meles* (Badger) were identified during the background data search within 2km of the proposed cable route.

24.4.66 Badger evidence was found during the initial animal walkover, and habitats suitable for the location of badger setts were found along the entire route. During detailed Phase 2 surveys, fifteen separate badger setts were identified along the proposed cable route and substation area. The details for each of the setts are summarised in the table below. Full details are provided within the accompanying confidential Badger Technical Report at Appendix 24.3 and Substation Technical Report at Appendix 24.11.

Table 24-5: Badger Setts Identified along Proposed Cable Route/Substation Site

Sett number	Distance from the edge of the Development Area	Sett Status
1	The closest hole is 62m from the Development Area	Main sett
2	Hole 1 is 29m from the Development Area	Subsidiary/Outlier
3	Holes 1, 2, and 3 are 22m from the Development Area	Subsidiary/Outlier
4	The sett is 29m from the Development Area	Main sett
5	Entire sett falls within the Development Area	Annex to sett 6
6	The closest hole is within 6m from the Development Area	Main sett
7	The closest hole is within 11m from the Development Area	Main sett/Annex to sett 6. Currently not active.
8	The closest hole is within 18m from the Development Area	Former main sett – abandoned/inactive

Sett number	Distance from the edge of the Development Area	Sett Status
9	The closest hole is within 23m of the Development Area	Main sett/Annex to sett 6
10	Entire sett situated on western edge of the Development Area	Main sett/Annex to sett 6
11	Hole 1 falls within the proposed working width. Holes 2–6 are 30m from the Development Area	Main sett – Abandoned/inactive
12	The closest hole is 34m from the Development Area	Former main sett – abandoned/inactive
13	Entire sett is situated on the eastern edge of the substation Development Area	Outlier
14	The closest hole is 125m from the substation Development Area	Outlier
15	The closest hole is 8m from the substation Development Area	Subsidiary/Outlier

Bats

24.4.67 Bats (Group) are listed as Species of Importance in the Brighton & Hove draft LBAP and the following bat species (of potential relevance to the proposed cable route) are listed as Priority Species in the UKBAP:

- *Barbastella barbastellus* (Barbastelle);
- *Myotis bechsteinii* (Bechstein's Bat);
- *Nyctalus noctula* (Noctule);
- *Pipistrellus pygmaeus* (Soprano Pipistrelle); and
- *Plecotus auritus* (Brown Long-eared Bat).

24.4.68 Bat surveys undertaken along the proposed cable route and substation area include ground level tree assessments; extensive tree climbing surveys; emergence surveys; manual bat activity surveys; and automated bat activity surveys. In addition a background data search was conducted which also included a suitability assessment of woodland for *Myotis bechsteinii* (Bechstein's Bat).

- 24.4.69 The background data search indicated the following species had been recorded in the data search area (5km from the proposed cable route): *Pipistrellus pipistrellus* (Common Pipistrelle), Soprano Pipistrelle, Brown Long-eared Bat, Noctule, *Eptesicus serotinus* (Serotine), *Myotis nattereri* (Natterer's Bat), *Myotis mystacinus* (Whiskered Bat), *Myotis* Bechstein's Bat, *Myotis daubentonii* (Daubenton's Bat) *Pipistrellus nathusii* (Nathusius' Pipistrelle), *Plecotus austriacus* (Grey Long-eared Bat) and Barbastelle.
- 24.4.70 One wood, located within 500m of the working width of the route was considered to be suitable for Bechstein's Bat. However, there is no similar woodland on the opposite side of the route and so severance of commuting routes between woods was not considered an issue. Therefore no further specialist surveys were carried out for the Bechstein's bat.
- 24.4.71 No bat roosts were recorded during the tree roost surveys.
- 24.4.72 The automated bat activity surveys recorded Common Pipistrelle; Soprano Pipistrelle; Nathusius' Pipistrelle; *Myotis/Plecotus* species; and *Nyctalus* species. Large numbers of bat passes (over 200 passes over a single night) were recorded at 15 individual locations. This was out of a total 31 hedgerows/linear features surveyed. Common and Soprano Pipistrelle were the two most common species recorded.
- 24.4.73 The manual bat activity surveys recorded Common Pipistrelle; Soprano Pipistrelle; *Myotis /Plecotus* species; *Nyctalus* species; and Serotine. All of the species recorded were commuting and foraging.
- 24.4.74 Full details are provided in the accompanying Bat Technical Report at Appendix 24.4 and Substation Technical Report at Appendix 24.11.

Dormouse

- 24.4.75 *Musccardinus avellanarius* (Hazel Dormouse) is a Species of Importance in the Brighton & Hove draft LBAP and a UKBAP Priority Species.
- 24.4.76 There is one record of Hazel Dormouse from the 2km search area, dated from 1981. However, suitable habitat was identified along the proposed cable route during the Phase 1 Habitat Surveys. Generally these were areas of woodland, tree-lined watercourses, hedgerows and associated scrub. The areas selected had a wide diversity of woody species contributing to three-dimensional habitat complexity, a number of food sources, plants suitable for nest-building material, and good connectivity to other areas of suitable habitat. A total of 467 nest-tubes and 41 nest-boxes were placed at 52 locations along the proposed cable route during Phase 2 presence/absence surveys. Two of these survey locations were situated at the proposed substation area.

24.4.77 A single Dormouse nest was found during the fourth check in a nest tube on the south side of the South Downs east of Titch Hill Farm. The hedge comprises semi-mature trees, with a very poor under-storey in places. The hedge is not large enough to support a viable population of Dormice without being connected to a larger area of suitable habitat. There are two large areas of suitable habitat near to the nest location. These are the wooded area called “The Mountain” to the south-east and a long thin strip of woodland to the north.

24.4.78 The location where the nest was found is not crossed by the proposed cable route, however there are two hedges to the south-east that provide ecological links to The Mountain and will be crossed by the proposed cable route (*Target Note 71 and 68*). These hedges could not be accessed at the time of survey due to health and safety reasons associated with bulls in the fields. However, given their proximity to a known population of Dormice, presence has been assumed at these two hedgerows. Full details are provided in the Dormouse Technical Report at Appendix 24.5.

Great Crested Newt

24.4.79 *Triturus cristatus* (Great Crested Newt, GCN) is a UKBAP Priority Species. The background data search revealed 12 records of GCN within the 2km search area.

24.4.80 Out of a total of 69 water bodies surveyed for GCN along the proposed cable route, 23 had confirmed presence with 16 ponds supporting a low population, 5 ponds supporting a medium population. 1 pond supporting a high population (based on Natural England’s population estimation guidance in the Great Crested Newt Mitigation Guidelines 2001) and 1 pond with an unknown population size.

24.4.81 A 250m buffer was applied around the water bodies with GCN present (which is the distance that GCN can often travel away from their breeding pond). These buffers overlap in many places to form six discrete areas of the proposed cable route with a risk of GCN being present. One of these areas overlaps with the proposed substation location, where there is also a risk of GCN being present. Full details are provided in the accompanying Great Crested Newt Technical Report, Appendix 24.6 and Substation Technical Report at Appendix 24.11.

Otter

24.4.82 *Lutra lutra* (Otter) is a UKBAP Priority Species. There is one record of Otter from the 2km search area. The date of the record is unknown.

24.4.83 All waterbodies were assessed on their suitability to support Otter during the Phase 1 surveys. This included an assessment of water depth, water quality, vegetation and cover. Thirteen stretches crossed by the proposed cable route were identified for further survey, two of which were dry at the time of surveying.

24.4.84 On the whole, the banks of the watercourses were made of earth and with a number showing signs of hoof-poaching from livestock. The habitat was generally flowing water or ditches and the vegetation dominated by herb, grass and reed species. The bordering land use is generally grassland, arable crops or parkland/gardens. These habitats are suitable but not ideal for Otter.

24.4.85 All areas, including the River Adur, were thoroughly searched and there were no signs of Otter recorded. The survey is sufficient to show that Otters are absent and therefore need not be considered further. Full details are provided within the Otter and Water Vole Technical Report at Appendix 24.7.

Water Vole

24.4.86 *Arvicola amphibius* (Water Vole) is a UKBAP Priority Species. There are ten records of Water Vole from the 2km search area. The dates of these records range from 1969 to the most recent in 2004.

24.4.87 All waterbodies were assessed on their suitability to support Water Vole during the Phase 1 surveys. This included an assessment of water quality, water levels, channel dimensions, bank material, vegetation cover, food sources and predation stresses. Eighteen stretches crossed by the proposed cable route were identified for further survey, five of which were dry at the time of surveying.

24.4.88 On the whole, the banks of the watercourses are earth and so are suitable for burrowing, though there is some hoof-poaching which reduces suitability. The habitat was generally flowing water or ditches and the vegetation dominated by herb, grass and reed species so there is abundant food for voles. There was evidence of rats on a large number of watercourse stretches, which would discourage Water Voles.

24.4.89 Though the habitat is suitable for Water Vole, no evidence was found, indicating that the species is absent and therefore need not be considered further. Full details are provided within the Otter and Water Vole Technical Report at Appendix 24.7.

Nesting Birds

24.4.90 The background data search identified a number of bird records within the 2km search area including the following notable species;

- *Tyto alba* (Barn Owl) – listed in the WCA, Schedule 1
- *Turdus iliacus* (Redwing) – listed in the WCA, Schedule 1
- *Turdus pilaris* (Fieldfare) – listed in the WCA, Schedule 1

- *Passer domesticus* (House Sparrow) – UKBAP species, Red list¹
- *Sturnus vulgaris* (Starling) – Red list
- *Turdus philomelos* (Song Thrush) – Red list
- *Columba oenas* (Stock pigeon) – Amber list
- *Emberiza citronella* (Yellowhammer) – UKBAP species, Red list
- *Falco tinnunculus* (Common Kestrel) – Amber list
- *Larus canus* (Herring Gull) – Amber list and Brighton and Hove draft LBAP Species of Importance
- *Larus ridibundus* (Black-headed Gull) – Amber list
- *Picus viridis* (Green Woodpecker) – Amber list
- *Poecile palustris* (Marsh Tit) – Red list
- *Prunella modularis* (Hedge Accentor) – Amber list
- *Pyrrhula pyrrhula* (Common Bullfinch) – Red list
- *Regulus regulus* (Goldcrest) – Amber list
- *Turdus viscivorus* (Mistle Thrush) – Amber list

24.4.91 Barn Owl boxes were noted on a number of trees along the proposed cable route, with one confirmed Barn Owl sighting from within the working area close to Great Wapses Farm on tree 1837 (tagged). The exact location of this tree is shown in Figure 5 of the Bat Technical Report at Appendix 24.4.

24.4.92 In addition two pairs of *Egretta garzetta* (Little Egret) were spotted nesting in a tree within the field immediately to the west of the River Adur, approximately 250m from the proposed cable route. Little Egrets are included on the Amber list.

24.4.93 Subsequent information on terrestrial bird species in the area of the proposed cable route was provided by the Royal Society for the Protection of Birds (RSPB) through comments on the Draft ES in August 2012. It was suggested that the migration routes of *Caprimulgus europaeus* (Nightjar) populations associated with three heathland SPAs – namely the Thames Basin Heaths, Wealden Heaths Phases 1 and 2 and Ashdown Forest – have the potential to be impacted by proposed cable route. These sites are situated over 20km from the Development Area.

¹ The UK's birds are split in to three categories of conservation importance - red, amber and green. Red is the highest conservation priority, with species needing urgent action. Amber is the next most critical group, followed by green.

24.4.94 Two additional bird species present in the vicinity of the proposed cable route were also highlighted; *Asio otus* (Long-eared Owl) and *Burhinus oedicephalus* (Stone Curlew). The Long-eared Owl is a resident in the south of England and although it is not listed on the WCA, Schedule 1, the RSPB noted that the numbers present in this area afford it a County level importance.

24.4.95 The Stone Curlew is listed on Annex 1 of the EU Birds Directive and Schedule 1 of the WCA. It is therefore protected from disturbance during its nesting season which extends from May to the end of July. The RSPB also noted that only a very small population is present on the open arable areas of the South Downs, and the precise location of any breeding pairs is highly sensitive and tends to change each year.

Reptiles

24.4.96 All four reptile species; *Vipera berus* (Adder), *Natrix natrix* (Grass Snake), *Anguis fragilis* (Slow-worm) and *Lacerta vivipara* (Common Lizard) have been recorded within the 2km background data search area. Adder is listed as a Species of Importance on the Brighton and Hove draft Local Biodiversity Action Plan and all four reptile species are UKBAP Priority Species.

24.4.97 The Phase 2 presence/absence surveys recorded all species apart from Adder, which was not found along the cable route or at the substation area.

24.4.98 In general, low numbers of reptiles were found, although higher numbers were recorded in the following areas:

- Disused allotment area south of the railway;
- Small area of rough grassland situated under a pylon to the south of the cable route near Steep Down;
- Old Erringham Farm Valley and Road Cutting SNCI, east of A283;
- Area of marshy grassland close to The Alders, Woodmancote; and
- Thin section of rough grassland on bank adjacent to track near Steep Down.

24.4.99 Full details are provided in the Reptile Technical Report at Appendix 24.8 and Substation Technical Report at Appendix 24.11.

Terrestrial Invertebrates

24.4.100 The background data search identified nine terrestrial invertebrate species within the 2km search area listed in the WCA 1981. This included; *Lysandra bellargus* (Adonis Blue), *Thecla betulae* (Brown Hairstreak), *Lysandra coridon* (Chalkhill Blue), *Hamearis lucina* (Duke of Burgundy), *Boloria euphrosyne* (Pearl-bordered Fritillary), *Cupido minimus* (Small Blue), *Lucanus cervus* (Stag Beetle), *Decticus verrucivorus* (Wart-biter) and *Satyrion w-album* (White-letter Hairstreak).

24.4.101 Out of these nine species, three were identified during Phase 2 surveys from areas along the proposed cable route; namely Adonis Blue (present in all three downland areas including Applesham Farm Bank SNCI (near Steep Down), Old Erringham Farm Valley and Road Cutting SNCI and Tottington Mount), Chalkhill Blue (Applesham Farm Bank SNCI and Old Erringham Farm Valley and Road Cutting SNCI) and Small Blue (Applesham Farm Bank SNCI and Tottington Mount – although it was not found within the proposed working area at Tottington Mount).

24.4.102 The dates of the survey visits for these target species were carefully selected based on known activity periods and weather conditions for the year. Full details are provided within the Terrestrial Invertebrate Technical Report at Appendix 24.9.

24.4.103 In addition Phase 2 surveys recorded several UKBAP species which are listed below together with the location in which they were found:

- *Adscita statice* (Forester Moth) – found at Tottington Mount;
- *Bombus ruderarius* (Bumblebee) – found north of the railway and at Old Erringham Farm Valley and Road Cutting SNCI;
- *Coenonympha pamphilus* (Small Heath) – found north of Truleigh Sands;
- *Erynnis tages* (Dingy Skipper) – found at Applesham Farm Bank SNCI (near Steep Down) and Old Erringham Farm Valley and Road Cutting SNCI. This species is also listed as a Species of Importance in the Brighton and Hove draft LBAP; and
- *Lasiommata megera* (Wall Brown) – found at Applesham Farm Bank SNCI (near Steep Down) and Old Erringham Farm Valley and Road Cutting SNCI.

24.4.104 Two additional moth species, which are flagged as UKBAP species ‘for research only’, were found. This included *Callistege mi* (Mother Shipton Moth) which was found at Applesham Farm Bank SNCI, Old Erringham Farm Valley and Road Cutting SNCI and Tottington Mount and *Tyria jacobaeae* (Cinnabar Moth), which was found north of the railway and at Tottington Mount.

24.4.105 Nine species of terrestrial invertebrate recorded feature in the Nationally Scarce category and forty-eight species recorded are listed formally as Nationally Local. These designations are based on estimates of the extent of distribution in the UK.

24.4.106 Full details are provided within the Terrestrial Invertebrate Technical Report at Appendix 24.9.

24.4.107 Results of the terrestrial invertebrate scoping survey undertaken at the proposed substation area highlighted the invertebrate interest of the hedgerow which runs east to west across the proposed substation and the grassland to the east of the substation area associated with the temporary access route. The hedgerow which separates the two fields at the location of the proposed temporary access route was also noted as having a high invertebrate value associated with four mature oak trees within its length. Several invertebrate species were noted flying about the bases of the trunks, including examples of the hoverfly *Brachyopa scutellaris*. This is a saproxylic species that is Nationally Scarce.

24.4.108 Full details are provided within the Substation Technical Report at Appendix 24.11.

Aquatic Invertebrates

24.4.109 The background data search identified two notable species of aquatic invertebrates within the 2km search area. This included *Chirocephalus diaphanous* (Fairy Shrimp) and *Aquarius paludum* (Water Strider) as well as a number of additional species that are associated with aquatic habitats.

24.4.110 Thirteen one-off spring or autumn samples were collected from proposed watercourse crossing points. All aquatic invertebrate species recorded within the samples are common and widely distributed within suitable habitats.

24.4.111 Water quality was found to be variable in water bodies sampled across the proposed cable route with the majority of watercourses crossed classed as having 'moderate to good' water quality. Herrings Stream supported the highest diversity of aquatic invertebrate taxa found across all sampling locations.

24.4.112 Full details are provided within the accompanying Aquatic Invertebrate Technical Report at Appendix 24.10.

Fish

24.4.113 There are records for *Salmo trutta* (Trout), *Anguilla anguilla* (European Eel) and *Pleuronectes platessa* (Plaice) within the 2km search area.

24.4.114 Additional data provided by the EA from the River Adur (grid reference TQ17124 03624) confirmed the presence of European Eel and *Scardinius erythrophthalmus* (Rudd).

24.4.115 Data was also provided from a survey site on the Teville Stream at Willowbrook Road (grid reference TQ16209 03879) Rudd, *Gasterosteus aculeatus* (Three-spine Stickleback), *Carassius auratus* (Feral (brown) Goldfish) and European Eel were all recorded in 2010. The bulk of the capture was of Rudd (50 individuals), although five individual eels were also caught.

24.4.116 Potential impacts on fish and shellfish that might arise from construction, operation and decommissioning of the offshore components of the Project are presented in Section 8 (Fish Ecology).

Summary Assessment of Nature Conservation Value

Table 24-6: Ecological Receptor Value

	Ecological Receptor	UK Value Inferred by Legislation	Intrinsic Value in Context of Development Area	Comments
Designated Sites	South Down National Park	National	National	The route passes through 14km of the National Park, crossing arable farmland, chalk grassland, the River Adur and associated saltmarsh fringes.
	Beeding Hill to Newtimber Hill SSSI	National	Site	There will be no direct impact on the SSSI however the proposed Development Area is situated 46m to the west of the site (at its closest point) and passes between two distinct areas of the site.
	Applesham Farm Bank SSSI	County	Site	The high value calcareous grassland has been avoided by an early re-route; however a small corner of the site falls within the proposed working area. This is predominantly young plantation with low ecological value.
	Lower Cokeham reedbed and ditches SSSI	County	Site	There will be no direct impact as works will be contained to the east of the site however the wet ditches which extend throughout the area are connected to this site and important for the site.
	Old Erringham Farm Valley and Road Cutting SSSI (and A283 Steyning Rd NV)	County	County	This site contains high value habitats and supports butterfly species listed in the WCA 1981.
	Ancient Semi-Natural Woodland	County	District	Good examples are present along the route, two areas of ANSW are situated on the edge of the proposed working area and one area is crossed at its eastern extent.
Habitats	Woodland, scrub and trees	National	Local	Semi-natural woodland is a UK (Lowland Mixed Deciduous Woodland), Sussex (Woodland), and Brighton & Hove (Lowland Mixed Deciduous Woodland) BAP Priority Habitat. Although small in extent along the route they have a local value.
	'Important' Hedgerows	National	District	Hedgerows are Priority Habitats in the UK, Sussex and Brighton & Hove BAPs. Eighteen 'Important' hedges are crossed by the proposed cable route and two 'Important' hedges are lost at the proposed substation, each individually is of District value.

	Ecological Receptor	UK Value Inferred by Legislation	Intrinsic Value in Context of Development Area	Comments
	'Not Important' hedgerows	-	Local	Species-poor hedges not qualifying as 'Important' are nonetheless of Local value <i>e.g.</i> as habitat corridors.
	Agricultural grassland	-	Site	Examples are present throughout the route, although they have low ecological value.
	Unimproved and semi-improved neutral grassland	National	Local	Lowland meadows are Priority Habitats in the UK and Sussex BAP and some good examples are crossed but the route but they are of local value only.
	Calcareous Grassland	National	County	Lowland Calcareous grassland is a UK, Sussex and Brighton & Hove BAP Priority Habitat. Good examples of species-rich grassland are crossed although impacts are generally restricted to two main areas.
	Marshy Grassland and Swamp	National	District	One area crossed is an example of the UK BAP Priority Habitat Purple Moor Grass and Rush Pastures. Other areas crossed are generally species poor although marshy grassland is rare in the local context.
	Tall herb and fern	-	Site	Examples are present throughout the route, although they have low ecological value.
	Coastal Shingle	National	Local	Coastal vegetated shingle is a UK, Sussex and Brighton & Hove BAP Priority Habitat, however only a very small area is present in the proposed working area.
	Saltmarsh	National	Local	Coastal saltmarsh is a UK and Sussex BAP Priority Habitat; however, only a very small strip is present on the route either side of the River Adur.
	Rivers & Streams	National	Up to County	Rivers and streams are Priority Habitats in the UK BAP. However, only the River Adur would qualify as this habitat type with the smaller streams crossed by the route having local value only.
	Ditches	-	Local	Ditches along the route support abundant vegetation and some are of local value.
	Ponds	National	Site	Ponds are a UK and Brighton & Hove BAP Priority Habitat. No ponds are currently crossed by the route.

	Ecological Receptor	UK Value Inferred by Legislation	Intrinsic Value in Context of Development Area	Comments
Other habitats	Arable	National	Local	Arable Field Margins is a UK and Sussex BAP Priority Habitat, however only low value examples are present along the route
	Semi-urban habitats	County	Site	'Urban' habitats are listed as Priority Habitats in the Sussex and Brighton & Hove BAP. Those present along the route are of low value and easily re-creatable.
Notable Plant Species	<i>Centaurea calcitrapa</i> (red star-thistle)	National	National	UK BAP Priority Species, found at Old Erringham Farm Valley and Road Cutting SNCI.
	<i>Bromus secalinus</i> (rye brome)	National	Local	Listed as 'Vulnerable' and 'Nationally Scarce', found in one area although observed in several areas off the route also so local population would be negligible.
	<i>Phyteuma orbiculare</i> (round-headed rampion)	National	Local	A Nationally Scarce species found in one area on the route, although noted as common on the Downs.
	<i>Thesium humifusum</i> (Bastard-toadflax)	National	-	A Nationally Scarce species not present in the proposed working area.
	<i>Trifolium scabrum</i> (Rough clover)	Regional	Local	A Nationally Uncommon species present in a small population on the route.
Bryophytes	Bryophytes and liverworts	Up to National	Site	Only common assemblages present along the route.
Invasive Species	<i>Fallopia japonica</i> (Japanese knotweed)	-	-	Listed in Schedule 9 of the WCA 1981. Present in a few areas along the route.
	<i>Heracleum mantegazzianum</i> (giant hogweed)	-	-	Listed in Schedule 9 of the WCA Act 1981. Present in a few areas along the route.
Protected species	Badger	National	Local	Badgers are protected under the Protection of Badgers Act 1992, which makes it unlawful for either an animal or its sett to be damaged or disturbed. However they are widespread in South East and are found in a range of habitats.
	Bats	International	District	All bat species recorded during surveys were common. However, they were found to be foraging and commuting in large numbers in some locations.

	Ecological Receptor	UK Value Inferred by Legislation	Intrinsic Value in Context of Development Area	Comments
	Dormouse	International	County	The Common Dormouse is a European Protected Species. Although only one dormouse nest was found in a single area, this is the first record found locally since 1981 and therefore it is of county importance.
	Great Crested Newt	International	District	Great Crested Newt is a European Protected Species. Presence was confirmed in 23 ponds within the survey area with good numbers of individuals found.
	Nesting Birds	National	Up to County	Key legislation relating to birds is the WCA 1981. There are records of common and notable (UKBAP, Red or Amber list) species in the vicinity of the route.
	Nesting Birds – Schedule 1 species	International	County	Barn Owl and Stone Curlew are listed on Schedule 1 of the WCA and are therefore afforded additional protection from disturbance whilst nesting. The population of Stone Curlew, despite its small size, it likely to be of County importance.
	Reptiles	National	Local	The three common species of reptiles were found within the survey area including Common Lizard, Grass Snake and Slow-worm. All are listed on Schedule 5 of the WCA 1981.
	Terrestrial Invertebrates	International	National	Three butterfly species listed on the WCA 1981 were found within the survey area. In addition, 7 UK BAP species, 9 Nationally Scarce species and 48 Nationally Local species were found to be present.
	Aquatic Invertebrates	International	Site.	All groups and species recorded were common.
	Fish	National	District	The European Eel is a UK BAP species. Records provided by the EA show them to be present in the Teville Stream and River Adur.

24.5 Predicted Impacts

Rochdale Envelope Principles

- 24.5.1 In line with the use of the “Rochdale Envelope” (see Section 5 – EIA Methodology), the assessment in this section has been based on a development scenario, which is considered to be the worst case in terms of ecological impacts. Rochdale Envelope principles relating to ecological impacts from the proposed onshore works relate primarily to the area of disturbance.
- 24.5.2 Installation of the cable will require a working width no wider than 30m (except at the locations where HDD is proposed), comprising 15m for the cable easement and 15m for additional areas for storage of excavated material and access along the cable trench. The cable easement will not necessarily be central to the working width. Therefore, the Development Area generally encompasses a working width of 40m along the cable route. A 40m working width has therefore been taken to represent the worst case scenario for the assessment of ecological impacts associated with the onshore cable route. The Development Area for the substation site covers an area of approximately 23.3ha. This includes the temporary construction access from Wineham Road and linkage to the existing Bolney substation via underground cable. Of this, up to 7.01ha will be required to accommodate the permanent footprint of the substation, with the remainder required for site establishment, lay down areas during construction, and landscaping.

Construction

South Downs National Park

- 24.5.3 Direct loss that is temporary in duration will occur to the following habitats in the South Downs National Park;
- Arable fields (approximately 13.6ha);
 - One ‘important’ hedgerow;
 - Chalk grassland (approximately 2.4ha);
 - Neutral grassland (approximately 1.5ha);
 - Marshy grassland (approximately 0.08ha);
 - Individual mature trees (number not yet confirmed);
 - One stream (crossed in two places), and
 - One river crossing (crossed using a HDD).

24.5.4 Potential impacts to these habitats are discussed in detail in the following sections.

24.5.5 Direct and indirect impacts will also occur to a number of species which the National Park supports. These include Badger, bats, reptiles, Dormouse, Great Crested Newt, nesting birds, invertebrates and fish species. All of these are discussed in detail in the following sections.

24.5.6 The proposed cable route would affect approximately 0.56km² or 0.035% of National Park land. This estimation has been calculated based on a 40m working area across 14km and is therefore a worst case approximation as the working width will be less than this in many places.

Beeding Hill to Newtimber Hill SSSI

24.5.7 There will be no direct impact on the SSSI as a result of the construction of the proposed cable route.

24.5.8 Working areas will be restricted to a 40m strip approximately 46m away from the SSSI site and will be temporary in nature therefore the potential for disturbance to chalk grassland species in the SSSI is negligible.

Applesham Farm Bank SNCI

24.5.9 Only a very small area of this SNCI will be directly impacted by the proposed cable route, approximately 300m² or 0.1% in total (assuming a 40m working width). The area affected is newly-planted plantation with very little ecological value; however, higher numbers of reptiles were found here compared to most areas along the proposed cable routes and these could be impacted by proposed works. The works will be temporary in duration and all habitat will be fully reinstated.

Old Erringham Farm Valley and Road Cutting SNCI and A283 Steyning Road Notable Verge

24.5.10 The entry or exit point for the River Adur HDD will be located within this site. Access into the site is from the A283 road through an existing gate approximately 2.5m wide. The A283 NV extends across both sides of the entrance. It is not currently known whether the entrance will require minor widening to allow heavy goods vehicle access. Therefore, a worst case assessment is direct loss of approximately 283m² of the NV. This impact will be temporary as all areas will be fully reinstated.

24.5.11 Approximately 1.4ha will be utilised for the drilling compound and associated equipment. This temporary land take will be restricted to the semi-improved neutral grassland at the base of the valley and will not encroach on the chalk grassland embankments either side of the valley or the ASNW to the south of the valley. Therefore, there will be no direct impact on chalk grassland areas or the butterfly species associated with them at this site.

- 24.5.12 Although there will be no direct loss of trees within the ASNW there may be indirect impacts as a result of damage to the root zones of retained trees situated close to works.
- 24.5.13 However, there is the potential for loss of a notable plant species *Centaurea calcitrapa* (Red Star-thistle), which is present on the farm track (further details in Section 24.5.44), as well as the temporary impact on the semi-improved neutral grassland.
- 24.5.14 Reptiles have been recorded in high numbers here and the working area will require a translocation (see Section 24.5.41). Four large *Aesculus hippocastanum* (Horse-chestnut) trees are present towards to the eastern end of the site at *Target Note 108*, these are diseased but provide potential habitat for species including birds and potentially bats. None of these trees will be lost as a result of works.
- 24.5.15 The site contains two natural ponds; a permanent pond which is present at the edge of the ASNW (*Target note 105*) and a temporary field pond that is situated close to the road at *Target Note 102*. Both of these ponds will be at risk as a result of proposed works. Direct impacts are likely for the temporary pond as it falls within the proposed working area and indirect impacts may occur to the hydrology of the permanent pond as a result of the drilling activities in close proximity.

Lower Cokeham reedbed and ditches SSCI

- 24.5.16 There will be no direct impact to this site. However, it is ecologically connected to a network of wet ditches in the wider area, some of which fall within the proposed HDD working area. Therefore, there is potential for indirect impacts associated with the risk of pollution events during construction and potential changes in hydrology.

ASNW

- 24.5.17 In addition to the unnamed area of ASNW within the Old Erringham Farm Valley and Road Cutting SSCI discussed above, there are two additional areas of ASNW currently close to or within the proposed working width.
- 24.5.18 Woodhouse Wood ASNW is situated on the edge of the working area and although no direct loss of trees in this wood will occur there may be indirect impacts as a result of damage to the root zones of retained trees situated close to works.
- 24.5.19 Paddock Wood ASNW is situated on the edge of the working area and although no direct loss of trees in this wood will occur there may be indirect impacts as a result of damage to the root zones of retained trees situated close to works.
- 24.5.20 In addition, one hedgerow on the route has been highlighted as an important link between two areas of ASNW which are situated outside of the proposed working width. This hedgerow will be breached to allow for the cable installation. Approximately 20m of hedgerow will be lost here.

Woodland, Scrub and Trees

- 24.5.21 The route generally avoids direct impact to large areas of semi-natural woodland. However, it does lie on the boundary of designated ancient woodlands at Woodhouse Wood, Old Erringham Farm Valley and Road Cutting SNCI and Paddock Wood as described above.
- 24.5.22 One small strip of semi-natural woodland at *Target Note 277j* north-west of the proposed substation area will be crossed by a temporary access road, approximately 16m wide which is required for the construction of the substation. The only other area of semi-natural woodland along the proposed cable route at *Target Note 141* has been avoided.
- 24.5.23 Mature trees are situated within hedgerows and as lines of trees throughout the route particularly in the northern section. While it may be possible to avoid the removal of some of these trees by minor route alignments during construction, there will evidently be a loss of individual trees. In addition, there is also potential for an indirect impact to retained trees which are situated close to works through potential root damage.
- 24.5.24 There will be also a direct loss of scrub in numerous places along the proposed route including approximately 80m² at *Target Note 139* where the scrub is equivalent in value to semi-natural woodland.

Hedgerows

- 24.5.25 There will be a permanent direct loss of two 'Important' (as classified by the Hedgerow Regulations) hedgerows (at *Target Notes 275* and *271/278*) as a result of the proposed substation. This equates to a length of approximately 600m of hedgerow lost in total across both hedges.
- 24.5.26 In addition, there will be a temporary direct loss, up to 16m wide at each hedgerow, from three 'Important' hedgerows (at *Target Notes 277a*, *277g* and *277j* – which has also been described in the semi-natural woodland section) crossed by the proposed construction access route for the substation from Wineham Lane.
- 24.5.27 For the proposed cable route, works will predominantly comprise a temporary, short-term, negative impact on hedgerows, associated with a 40m loss of hedgerow habitat at breaches required for subsequent construction works.
- 24.5.28 The impacts on species-poor hedgerows crossed by the route will be limited to temporary removal of hedgerow sections. However, there are a total of 18 older species-rich hedgerows that are crossed by the cable route and which qualify as 'Important' under the ecological and historical criteria of the Hedgerow Regulations 1997.

24.5.29 At these hedgerows, part of the impact will be temporary since replacement of a hedgerow and superficial recovery is achievable exactly as for species-poor hedgerows discussed above. However, there is likely to be some degree of long term impact as well, since these have the nature conservation characteristics of ancient countryside features and like-for-like recovery of their typically complex assemblages of field layer plant species (especially ancient woodland indicators), invertebrates and mycorrhizal fungi cannot realistically be expected within timeframes normally adopted for the definition of temporary impacts in EIA.

24.5.30 There will also be temporary impacts associated with fragmentation of the hedgerow network, which may have cumulative impacts on their use as wildlife corridors (see section 24.5 'Construction- Bats' for further details).

24.5.31 Throughout much of the route, the loss of large lengths of hedgerow has been avoided (i.e. when hedgerows run parallel, and in close proximity, to the working width) by route changes. However, sections of the hedgerows situated either side of Bob Lane (*Target Notes 279 and 280*) may be lost to allow safe construction of the proposed cable route and substation.

Grassland

24.5.32 Works will represent a temporary, negative impact on grassland associated with habitat loss during vegetation removal and topsoil stripping of the working width. The great majority of the grassland is agriculturally improved and therefore species-poor.

Unimproved and Semi-improved Neutral Grassland

24.5.33 There are six areas of neutral grassland crossed by the proposed cable route including three good examples of neutral grassland. One of these is situated at *Target Notes 26, 35 and 42*, north of the railway. The entry or exit point for the railway HDD will be located here. Approximately 0.75ha of neutral grassland will be directly impacted here.

24.5.34 Direct loss of good examples of Lowland Meadows will occur at *Target Notes 150* on the proposed cable route (approximately 0.1ha) and at *Target Note 277i* as a result of the temporary access road required for the substation construction. The access road will be no wider than 16m and will be in place for up to 2 years; therefore approximately 0.37ha of the BAP habitat Lowland Meadows will be lost here.

24.5.35 Any impacts on the damp neutral grassland east of the River Adur will be avoided as the cable will be installed under the River Adur and the A283 road using HDD.

Calcareous Grassland

24.5.36 Routes changes have avoided any direct impact on chalk grassland areas at Applesham Farm Bank SNCI.

- 24.5.37 It is also noted that direct impacts to the chalk grassland embankments either side of the valley bottom at the Old Erringham Farm Valley and Road Cutting SNCI will also be avoided.
- 24.5.38 The chalk grassland to the east of Lambleys Barn cannot be avoided and there will be a direct impact on approximately 0.8ha of semi-improved chalk grassland habitat here.
- 24.5.39 Perhaps the most notable impact to chalk grassland on the proposed cable route is at Tottington Mount. The proposed cable route has been divided into three sections here, each section has differing topography and therefore different engineering approaches will be used (as detailed in Section 2 – Project Description).
- 24.5.40 Section TM1 (*Target Note 110*) traverses a hillside with slopes of up to 1:5. This section is improved grassland of low ecological value that will quickly recover.
- 24.5.41 Section TM2 (*Target Notes 111, 111a, 111b and 111c*) is approximately 750m long. The working width in this section will be 21m wide. It is generally flat across the proposed working width however at points, for example at *Target Note 111c* there are slopes of 1:4.
- 24.5.42 The direct removal of chalk grassland at this section has been reduced to four 1m wide strips above each trench. Bog mats or similar will be used to create the haul road. The trench furthest from the haul road will be excavated first and then backfilled before excavation of the adjacent trench begins. A light excavator will be used for the excavation and it will traverse on bog mats either side of the trench.
- 24.5.43 The turf/topsoil and trench material will be deposited to one side of the trench on the furthest side from the haul road. Once the cable is laid the spoil and turves will be replaced and the operations would then move to the beginning of the next trench with the excavated material placed over the first trench. This will be repeated for the third and fourth trenches.
- 24.5.44 Placing the turves and trench spoil on top of areas of additional chalk grassland will result in shading and possible compaction impacts as will the use of construction plant in this area. The width of the affected area in this section will be approximately 21m.
- 24.5.45 In addition, there is a small area of chalk grassland within Section TM2 which lies above an archaeological site (see Section 25 – Archaeology and Cultural Heritage). In this area (approximately 15m x 15m) advance excavation will be undertaken by an archaeologist using hand tools only. This activity will result in the removal of the topsoil and seed bank to expose the natural chalk/archaeological horizon and therefore viable turves will not be able to be harvested from this area.

24.5.46 Section TM3 (*Target Notes 111d and 111e*) is over the last 100m of chalk grassland and is on very steep terrain with possible gradients of 1:2.5 or more. A haul road cannot be safely negotiated in this area due to the gradients, therefore topsoil stripping and turfing will not be feasible in this section. Two methods have been proposed, the first is to strip a 12m section and install the ducts one by one and the second is to carry out the trench removal and ducting in two stages so only a 6m width will be stripped at a time.

24.5.47 In addition to the direct impacts discussed above there are a number of indirect impacts that could occur as a result of the proposed works, as summarised below:

- Potential settlement in the trench areas due to the backfill material used - this has the potential to become a natural watercourse which would increase the risk of erosion;
- Changing soil conditions through compaction or mixing of soil layers – this can affect the nutrient status and pH which can result in a different plant community arising;
- Changing soil depths and structure – this can affect the species which will re-colonise as competitive species can dominate if soil builds up above the natural depth; and
- Loss of individual plants due to damage of the turves – this will result in areas of bare ground which will have an increased risk of erosion by wind, water and animals.

24.5.48 Impacts associated with the disturbance to chalk grassland fauna are dealt with in sections 24.5 'Construction –Badger' and 24.5 'Construction – Terrestrial Invertebrates'.

Marshy Grassland and Swamp

24.5.49 Species rich marshy grassland at *Target Note 27* will be avoided, as it is outside the HDD working area. However, a small corner of the marshy grassland at *Target Note 162* (approximately 0.3ha) will be directly impacted.

24.5.50 Potential impacts to the swamp at *Target Note 32* have been discussed within the 'Lower Cokeham reedbed and ditches SNCI' section at paragraph 24.5.16.

Coastal Shingle

24.5.51 Coastal shingle at the landfall is un-vegetated except for a 10m wide strip along the upper foreshore. The cable will be installed at the landfall using HDD; however there will be an impact on the foreshore due to traversing of heavy vehicles during construction of the cable landfall. This has the potential to cause direct disturbance to the vegetation, albeit to a small area (approximately 400m²).

Saltmarsh

- 24.5.52 There will be no direct impact on the areas of saltmarsh either side of the River Adur, as the cable will be installed at the River Adur using HDD.

Rivers, Streams and ditches

- 24.5.53 Apart from the River Adur crossing identified for HDD, the default crossing method of watercourses will be trenching. The exact methodology to achieve an open trench across each stream and the temporary bridge arrangements required will be decided by the works contractor.

- 24.5.54 Works will only result in a temporary, short term, negative impact on the watercourses and their immediate surroundings, associated with the provision of flumed crossings (or equivalent), installation of temporary bridges and trenching operations. Habitat removal will, where practicable, be restricted to the minimum working width of 20m.

Ponds

- 24.5.55 There is one pond that is likely to be directly affected by the proposed cable route at *Target Note 102*. This is a temporary pond situated within the Old Erringham Farm Valley and Road Cutting SNCI. Four additional ponds lie close to the edge of the proposed working area (at *Target Notes 105, 161, 264 and 297b*) and may be indirectly impacted by disruptions to hydrology as a result of trenching operations.

Arable Habitat

- 24.5.56 There will be a direct temporary loss of approximately 27.6ha of arable habitat along the proposed route, particularly across the South Downs and towards the northern end of the route.

Semi-urban Habitats

- 24.5.57 There will be a direct temporary loss of an 850m section of semi-urban habitats (across varying working widths) at the southern end of the proposed route. This consists of an area of amenity grassland, (the Brooklands Pleasure Grounds) with assorted amenity shrubs and trees, and an adjacent golf course.

Notable Plant Species

- 24.5.58 There is a risk of direct loss of individual notable plants specifically at the farm track in the Old Erringham Farm Valley and Road Cutting SNCI (Red Star-thistle); the margins of an arable field at *Target Note 108a* (Rye Brome); calcicolous grassland at *Target Notes 111 and 69* (Round-headed Rampion) and on the shingle at *Target Note 1* (Rough Clover).

Invasive Plant Species

- 24.5.59 There is a potential risk that construction activity in areas where invasive species have been found along the route will result in the spread of these species through moving plant fragments or contaminated soil. Any activity that causes the spread of Japanese Knotweed or Giant Hogweed will contravene the WCA 1981.

Badger

- 24.5.60 It is likely that a number of setts (up to thirteen currently) will experience temporary disturbance (as defined by NE in the Badger Disturbance Guidance document published in 2009) as a result of the construction of the proposed cable route and substation.
- 24.5.61 In addition, there may be the need to permanently close up to four setts depending upon the final areas required for the construction of the proposed cable route and substation.
- 24.5.62 The impact to Badger foraging habitat will be minimal due to the small scale of works in relation to the extent of available Badger foraging habitat in the surrounding areas. However in some instances the fenced working width may constitute a temporary barrier to movement during construction.

Bats

Annex II Species

- 24.5.63 The proposed route is not located between two woodlands which are suitable for Bechstein's Bat according to the Bat Conservation Trust's (BCT) Bechstein's Project wood habitat suitability criteria (BCT 2009). Only one wood was recorded as suitable within the 500m search area. Therefore it is assumed that the severance of hedgerows will not significantly impact Bechstein's Bat should the species be present and commuting between different suitable woodlands.
- 24.5.64 In addition, no Barbastelle Bats were recorded during any of the bat surveys undertaken. Therefore, Annex II species are not considered separately to all bat species as part of the assessment process.

Roosting Bats

- 24.5.65 A small number of trees (number not confirmed yet) that have been classified as having potential to support roosting bats will have to be removed to facilitate the construction of the cable. However, no tree roosts were recorded within the survey area. Therefore, no impacts to known roosts are anticipated. However, bats are known to move roost frequently, and can switch roosts every three days. Therefore the tree removal works may permanently reduce the potential roost 'stock' of an area which is available to bats. As few trees with potential to support bats are due for removal is thought the tree removal will have a negative impact at the local level.

Commuting and Foraging Bats

- 24.5.66 There are multiple potential impacts to commuting and foraging bats as a result of vegetation clearance and construction of the cable. To facilitate the construction of the cable, 20-40m sections of hedgerow will be removed and grassland will have to be stripped. The removal of vegetation will reduce the insect biomass of the area and therefore will reduce the foraging habitat available to bats within the working width. This has the potential to cause a negative impact to bats which has the potential to reduce breeding success of certain bat species. The Brown Long-eared Bat is known to forage over a small area (between 500m and 1km) of their roosts (Entwistle *et al.*) and so the reduction in available foraging habitat may be particularly significant for this species.
- 24.5.67 The impacts are likely to vary depending on how regularly used and important a hedgerow is to bats. For example, the reduction in foraging habitat caused by the hedgerow section removals may have a more significant impact on regularly used hedgerows where a high level of bat activity was recorded compared to hedgerows where lower bat activity was recorded. Fifteen locations all recorded over 200 bat passes. Out of these fifteen hedgerows, eleven will be crossed by the proposed cable route and two will be impacted due to the works at the proposed substation (bat activity survey points 42 and 43).
- 24.5.68 Impacts to foraging and commuting bats associated with the proposed substation include the permanent loss of a large section – approximately 200m – of one hedgerow at *Target Notes 271/278* (bat activity survey point 42) and a temporary breach up to 75m wide of the hedgerow at *Target Note 277p* (bat activity survey point 43). There will also be an additional temporary breach further north along the length of this hedgerow for the proposed temporary access road during the substation construction.
- 24.5.69 Bats are known to use hedgerows to commute along in order to navigate around the landscape and some species are potentially sensitive to gaps in hedgerows such as species in the genera *Myotis* and *Plecotus* due to the nature of their flight pattern. Species from the genera *Nyctalus* and *Eptesicus*, and Nathusius' Pipistrelle Bats are known to fly high and in open habitats and therefore are unlikely to be impacted by hedgerow severance. Common Pipistrelle and Soprano Pipistrelle Bat are generalist species and will tolerate gaps in hedgerows. There is very limited research regarding whether gaps actually present a significant problem for *Myotis/Plecotus* species. The gaps in hedgerows also have the potential to increase the risk of predation of bats. Bats will be more visible to potential predators while they fly across the gaps as they will have no cover. It is anticipated that without mitigation the hedgerow severance has the potential to have a temporary, negative impact on bats at the district level.

24.5.70 If the proposed works are undertaken during the night, lighting would be required which has the potential to impact on bats. Different bat species vary in their sensitivity to lighting. *Myotis/Plecotus* species are the most light-sensitive species recorded in the survey area. The impact of the lighting has the potential to reduce the available foraging and roosting habitat for bats as the lighting may deter bat from using a hedgerow or reaching a favour roosting site. The temporary impact of lighting has the potential to have a negative impact on bats on a district level. Of the fifteen locations with high numbers of bats, only bat activity survey point 9 has the potential to be affected by 24 hour HDD operations (Sompting Bypass HDD).

Dormouse

24.5.71 The area in which the individual Dormouse nest was found will not be impacted by the proposed cable route as it currently lies outside of the proposed working width. However, Dormouse presence has been assumed for two adjacent connected hedgerows (*Target Note 71* and *68*), which will be breached during works (see Section 24.5 'Construction - Dormouse' and the accompanying Dormouse Technical Report at Appendix 24.5 for further details).

24.5.72 There is therefore a potential risk of direct injury to an individual Dormouse occurring during habitat removal works.

24.5.73 Indirect impacts associated with disturbing potential commuting and foraging routes are harder to quantify. However, it is noted that the area where the Dormouse nest was found is not large enough to support a viable population of Dormice without being connected to a larger area of suitable habitat. Two areas of potential habitat have been highlighted; connection to these areas would be temporarily disrupted as a result of hedgerow breaches in this area which would be undertaken under a licence from NE.

Great Crested Newt

24.5.74 No Great Crested Newt breeding ponds will be lost as a result of the works. Newts will therefore only be at risk in their terrestrial phase. Direct impacts can include individual newts being killed by machinery, either directly or as a result of vibration. Also, the proposed cable works may affect dispersal routes as a linear trench is dug across suitable habitat near breeding ponds.

24.5.75 In general, impacts to terrestrial Great Crested Newt habitat will be restricted to small areas and will only be temporary while hedgerow gaps and areas of scrub regenerate. However, at the proposed substation there will be a permanent loss of 7ha of Great Crested Newt terrestrial habitat which includes two hedgerows and semi-improved grassland. The grassland does not provide high quality foraging or hibernating habitat however the hedgerows are likely to be important for dispersal.

Nesting Birds

- 24.5.76 The removal of 40m wide sections of hedgerows (20m in sensitive locations) and lines of trees will result in the temporary loss of potential nesting sites for birds during construction and the first few years of hedgerow restoration.
- 24.5.77 The impact will decrease as the hedgerow acquires structure. Essentially, similar considerations apply to loss of potential nesting habitat for ground-nesting birds particularly any farmland birds that use arable fields to nest in, of which there is a large amount along the cable route. Conversely, the works will only temporarily affect a small proportion of the habitat available for birds in any given place.
- 24.5.78 Temporary displacement of bird species associated with increased noise, activity and visual disturbance may reduce the number of species and the absolute numbers of birds nesting close to works. There is potential for notable bird species including Little Egret, Long-eared Owl, Barn Owl and Stone Curlew should construction activity overlap with their nesting time. However, the effect will be confined to the construction period, which involves only short periods of activity at any given location.
- 24.5.79 With regards to the Schedule 1 birds present within the vicinity of the proposed route (Barn Owl and Stone Curlew), it is an offence to intentionally or recklessly disturb the bird at, on or near an 'active' nest.
- 24.5.80 There will be no direct impact to habitat which is used by breeding Nightjars (heathland and heathland/woodland margins) given the distance to known populations at the designated sites. However, migrating Nightjars fly at night and therefore they could be disturbed by lighting along their migration routes. It should be noted that 24 hour lighting is proposed at the 4 main HDD locations. However, three of these locations are within or border the conurbation of Worthing and are therefore subject to lighting impacts associated with urban development. Therefore, only one main HDD at the River Adur crossing will require lighting within a rural setting.

Reptiles

- 24.5.81 Impacts on reptiles can be both direct and indirect. Direct impacts are associated with potential injury or harm to individuals which could occur during vegetation clearance of the working areas including strimming of areas of rough grassland, patches of scrub, and removal of sections of hedgerow.
- 24.5.82 Indirect impacts are associated with the temporary loss of habitat as a result of vegetation clearance, which could restrict the breeding success of localised populations of reptile.

Terrestrial Invertebrates

- 24.5.83 Impacts on terrestrial invertebrate species will generally be small as only a small proportion of available habitat and extant populations will be affected in any given place.
- 24.5.84 Direct impacts to the target species (Adonis Blue, Small Blue and Chalkhill Blue) have been avoided at Applesham Farm Bank SNCI as the route now passes through a small area of the site which is newly planted plantation and avoids all areas of chalk grassland habitat in this area.
- 24.5.85 At Old Erringham Farm Valley and Road Cutting SNCI the target species are associated with the chalk embankment area only. This area was highlighted during the engineering walkover and it was agreed that it would be unaffected by works.
- 24.5.86 At Tottington Mount, a large area of chalk grassland lies within the route, therefore direct and indirect impacts are likely to occur to populations of Adonis Blue butterfly associated with the chalk grassland here. Because adult butterflies are mobile it is unlikely that construction will directly affect them. However, there is a direct risk to the caterpillars, which are present on the food plant *Hippocrepis comosa* (Horseshoe Vetch).
- 24.5.87 There is also potential for indirect impacts should construction of the cable route impact on the populations of the individual food plants present in this area (i.e. if they do not re-colonise). It should also be noted that the Adonis Blue butterfly has a complex relationship with species of red and black ants which are also found in chalk grassland. The ants are thought to protect the pupal stages of the butterfly and therefore any direct or indirect impacts on the populations of these ants could also have an effect on the population of Adonis Blue butterfly in this area.

Aquatic Invertebrates

- 24.5.88 There is potential for the loss of aquatic invertebrates at open-cut crossings of watercourses (using either wet or dry techniques), but impacts will be limited as only a small proportion of available habitat and extant populations will be affected in any given place.
- 24.5.89 The River Adur will be crossed using a HDD, so no impact to aquatic invertebrates will occur here.

Fish

- 24.5.90 All watercourse crossings (apart from the River Adur, which will be crossed by HDD) will be carried out using an open-cut technique. This technique has the potential to disturb fish during works both directly and indirectly through pollution and increases in turbidity caused by sediment-laden run-off or disturbance to bed material.

- 24.5.91 There is also a risk of direct impact to individual European eels during open-cut procedures.

Operation

- 24.5.92 Access will be required to specific areas of the cable route (mainly the link boxes) approximately every 2 to 5 years to carry out necessary testing. The locations of the link boxes are currently unknown. However, it is not envisaged that any large plant or equipment will be required for the testing works and therefore no significant impacts during the operation of the proposed cable route are anticipated.
- 24.5.93 In addition, the proposed substation will be designed to be unmanned during operation, although occasional safety/maintenance checks will be required. Therefore, no significant impacts during operation are anticipated.

Decommissioning

- 24.5.94 At decommissioning it is anticipated that the onshore cables will be left buried in situ, unless lifted to be replaced by new cables to be run along the same route as part of future developments or wind farm re-powering. Details of the decommissioning of the cable route will be investigated in detail at the end of its service life. It is likely that ducting will remain in place; however, the cables may be pulled out of the ducts via the jointing bays. Impacts at these specific locations will be similar scale to impacts described in this section for construction.
- 24.5.95 No decision has been made regarding the final decommissioning policy for the proposed substation, as it is recognised that industry best practice, rules and legislation change over time. The onshore substation may continue to be used as a substation site after the Project has been decommissioned. However, if it was to be dismantled it is not believed that any significant impact to the surrounding ecological receptors would occur.

24.6 Mitigation Measures

- 24.6.1 The mitigation measures presented in this section will be incorporated into an Ecological Management Plan to be approved by WSCC.

During Construction

South Downs National Park

- 24.6.2 Specific mitigation measures will be put in place for each affected habitat and species; these are discussed in detail in the following sections.
- 24.6.3 All mitigation measures within the South Downs National Park and will be carried out to standards/specifications agreed with the SDNPA.

Beeding Hill to Newtimber Hill SSSI

- 24.6.4 There is no specific mitigation proposed for this site, however post-construction monitoring will be undertaken at Tottington Mount which may provide valuable information on the areas of chalk grassland adjacent to the SSSI. This information will be provided to NE on an annual basis and could potentially help inform future long term management of the SSSI and its surrounds.

Applesham Farm Bank SNCI

- 24.6.5 Designed-in mitigation included a route change in this area to avoid sensitive chalk grassland habitat.
- 24.6.6 To enhance the site and compensate for the loss of an area of new plantation, a small amount of scrub removal will be undertaken from the nearby chalk grassland embankment adjacent to the path. This would result in an overall beneficial impact to the site.

Old Erringham Farm Valley and Road Cutting SNCI and A283 Steyning Road Notable Verge

- 24.6.7 Widening of the existing entrance to the site from the A283 will be minimised as far as possible to reduce the direct impact to the A283 NV. In addition, seed will be harvested from the verge prior to the works commencing to aid the restoration of the road verge post-construction.
- 24.6.8 During construction the areas of chalk grassland embankment and ASNW will be fenced off and marked clearly as ecological sensitive areas to ensure that there is no encroachment during works. The trees and scrub present within the section of ASNW close to the proposed working area are young and therefore indirect impacts from root damage due to their proximity to drilling works are unlikely. However, an arboricultural survey will be undertaken here to confirm whether any additional mitigation associated with the protection of the trees is required. This will also be applied to the group of *Aesculus hippocastanum* (Horse-chestnut) trees at this site which are to be retained and protected.
- 24.6.9 To mitigate the loss of a notable plant species, protection will be installed over the existing farm track (for example, aluminium tracks).
- 24.6.10 Removal of scrub from the chalk grassland embankments and reinstatement of ponds (the site citation refers to three derelict ponds being present and requiring management) will also be undertaken to compensate for any habitat loss to this site. This is in agreement with the WSCC ecologist.

Lower Cokeham reedbeds and ditches SNCI

- 24.6.11 Pollution prevention guidelines from the Environment Agency will be implemented throughout the HDD working area north of the railway. This will minimise the potential for pollution incidents to impact on this site. In addition, the natural water flow in this area will not be impeded during the proposed works, unless required in the case of emergency.

ASNW

- 24.6.12 Areas of ASNW will be avoided and clearly marked to indicate their sensitivity during construction. Where possible, a buffer of between 5m and 15m will be maintained between the ASNW site boundary and the edge of the working width.
- 24.6.13 For the area of Paddock Wood ASNW (and which has been highlighted as important for foraging and commuting bats) the Development Area has been refined in order that the working area will be maintained to the east of the ASNW boundary.
- 24.6.14 The hedgerow breach at *Target Note 160* will also be reduced to 20m to minimise the impact to the ecological network.
- 24.6.15 In addition generic measures described in the section below will be implemented to protect root systems when there is risk of them being present within the working area. When detailed working areas have been confirmed, further guidance will be sought from an arboriculturalist to advise on appropriate working distances from the areas of ASNW.

Woodland, Scrub and Trees

- 24.6.16 A pre-construction walkover survey will be undertaken by an appropriately experienced arboriculturalist as soon as a detailed working area has been agreed.
- 24.6.17 They will define specific mitigation measures required for all trees situated in or adjacent to the working width.
- 24.6.18 The typical mitigation measures that will be employed during construction to minimise the impacts upon trees and woodland are as follows:
- The roots of retained trees along the edge of the working width will be protected from soil compaction by the enforcement of root protection areas that will be fenced off from the construction. (the extent of which will be calculated using guidance from BS 5837:2012);
 - Facilitation pruning may be recommended where tree crowns are at risk from impact by machinery or high sided vehicles;
 - The working width within woodlands will be reduced by storing soils from the woodland areas within the working width of adjacent sections of lower value habitat (on the same landownership);

- Soil excavated from within the woodland areas will be stored separately to that removed from either side of the woodland. This will protect any seeds which may be present within the ancient woodland soil. Soil will be stored in a fenced-off area; highlighting its different origin to soil excavated outside of the woodland and preventing mixing of the two;
- The woodland soils will be replaced within the woodlands on completion of the cable installation;
- A Project Reinstatement Plan (PRP) will be prepared and agreed with SDNPA;
- Replanting will be with native species, preferably of local origin at a 2 for 1 ratio;
- To aid establishment of trees and shrubs, they will be protected by tree-guards and weeds will be controlled;
- Where possible, removal of vegetation will be timed to avoid the bird breeding season as noted in Section 24.6. 'During construction – Nesting Birds'; and
- If bat roosts are found in the trees then the mitigation measures set out in Section 24.6 'During Construction – Bats' will be followed.

24.6.19 In addition to the measures described above, a number of high value mature trees have been identified along the route and discussions have been had with project engineers to reduce the risk to these individual trees where possible. These measures include the following:

- A group of *Aesculus hippocastanum* (Horse-chestnuts) at *Target Note 108* – the working area will be sited to the south of the easement here and the trees fenced off during construction to reduce any impact;
- A *Quercus robur* (Pedunculate Oak) at *Target Note 133* – the cable easement will be micro-sited to avoid impacting the tree and the tree will be fenced off during construction;
- A *Quercus robur* (Pedunculate Oak) at *Target Note 139* within a narrow corridor of high value scrub habitat along the banks of a stream – the cable easement will be micro-sited to the east, where possible, to avoid impacting the tree and the working width will be reduced to 20m at the stream crossing to minimise the impact on the stream corridor and high value scrub;
- A *Quercus robur* (Pedunculate Oak) at *Target Note 149* - the cable easement will be micro-sited, where possible here, to avoid impacting the tree;

- A *Quercus robur* (Pedunculate Oak) (near *Target Note 177*) situated in the middle of a field, south of Woodhouse – the working area will be sided to the west of the easement here and the tree will be fenced off during construction;
- two *Quercus robur* (Pedunculate Oaks) at *Target Note 285*, located either side of cable easement – the working width will be minimised at this location to reduce damage to these trees;
- A line of trees at *Target Note 292* – the tree line will be maintained where possible and the working width reduced to 20m at this crossing however there will be a residual loss of trees here;
- A narrow woodland strip at *Target Note 297* and mature trees at *Target Note 298* situated either side of a road crossing – the working width will be reduced to 20m here to reduce the impact on woodland and trees;
- An area of semi-natural woodland at *Target Note 299* outside Paddock Wood ASNW – the working width will be minimised and the easement and working area will be maintained to the east of the ASNW; however there will be a residual loss of trees here;
- A *Quercus robur* (Pedunculate Oak) at *Target Note 316* with a nesting Barn Owl – the cable easement will be micro-sited to avoid impacting the tree and the tree will be fenced off during construction; and
- A *Quercus robur* (Pedunculate Oak) at *Target Note 258* – the working area will be sided to the west of the easement and the tree will be fenced off during construction.

24.6.20 With regard to the thin strip of semi-natural woodland at *Target Note 277j*, a crossing location for the temporary substation construction access road will be selected based on which location has the least impact on high value mature trees. Advice will also be sought from an arboriculturalist on any additional measures required to protect trees either side of the access route.

Hedgerows

24.6.21 Compensatory planting for the two 'Important' hedgerows lost at the proposed substation will occur at two locations to the north and east of the proposed substation. An indicative landscape strategy has been prepared for the substation site – see Figure 26.6 in Section 26 (Landscape & Visual). The species planted will be of native origin and will reflect the species present within this area and that which will be lost. Careful consideration will be given to the location of the compensatory planting to ensure that the hedgerow connectivity of the local area will be enhanced.

24.6.22 The prompt reinstatement of hedge banks and ditches and planting of shrubs will achieve considerable recovery in the first 2–3 years. The time required for overall recovery of the hedgerow to the original condition will depend upon the age, diversity and management history of the individual hedgerow, being longer for more species-rich and complex hedgerows.

24.6.23 For non-important hedgerows where there are no protected species issues (e.g. they are not used as important commuting/foraging routes by bats), the following measures will be followed:

- The topsoil (including any bank) from beneath the hedgerow will be stripped and stored separately;
- Vegetation and topsoil from any associated ditch will be stripped and stored separately;
- Soil storage areas will be clearly signed and demarcated to prevent any mixing with other soils;
- Banks and ditches will be reformed to similar profiles as before;
- Topsoil will be replaced after works;
- Planting will use native species, preferably of local origin;
- Planting will use shrubs of the same species and in the same general proportions as existed pre-construction; and
- To aid establishment of replanted trees and shrubs, they will be protected by stock-proof and either rabbit-proof fencing or tree guards.

24.6.24 The mitigation measure for the ‘important’ hedgerows will be the same with the exception that where viable:

- Vegetation will first be trimmed to ground level; and
- Where possible, geotextile will be used for the running track to reduce the amount of topsoil being stripped (this will aid reinstatement of vegetation).

24.6.25 Eleven hedge crossings along the cable route have been identified as sensitive to bats in the area that use the hedge line for feeding, orientation and guidance at night. An additional two hedge crossings have been highlighted as sensitive for dormouse populations and connectivity and one hedge crossing has been highlighted as sensitive for invertebrates. At all of these hedgerow breaches soil storage will be offset along the working spread to minimise the amount of hedge removed at the crossing point. The working width will be reduced to 20m at these specific hedgerow crossings (see sections 24.6 ‘Construction – Bats’ and 24.6 ‘Construction – Dormouse’ for further details).

24.6.26 In three locations, hedgerows run parallel to the proposed cable route (*Target Notes 119, 254 and 175* – the later is also a hedgerow which is sensitive to bats). The working area at these locations will be maintained to the east of the easement to avoid removing long lengths of hedgerow.

24.6.27 Similarly, at *Target Notes 286, 287, 289, 291* the working area will be sided to the west of the easement to avoid removing a long length of hedgerow and multiple trees.

Grassland

24.6.28 In all grassland (outside of the chalk grassland areas) topsoil will be stripped, stored and replaced to retain the seed bank. Reinstatement of improved grassland areas may be supplemented by seeding, using standard agricultural seed mixes, however this will be at the discretion of the landowner and SDNPA will be consulted beforehand if areas are within the SDNP.

24.6.29 In neutral grassland areas, natural regeneration is preferred and no supplementary seeding will be used. However topsoil from the neutral grassland at the temporary construction access road (*Target Note 277j*) will need to be stripped and stored for up to 2 years. Therefore to mitigate for any loss in viability of the soil after this time, seed will be harvested from the area prior to construction commencing and the impacted area will be re-seeded during reinstatement.

24.6.30 The proposed cable route crosses chalk grassland in two locations: east of Lambleys Barn and Tottington Mount, both of these areas are on steep slopes. The chalk grassland to the east of Lambleys Barn is generally in unfavourable condition and covers a relatively small area (approximately 7,600m²). Standard topsoil strip as described above will be implemented here however during reinstatement the area will be re-seeded with seed harvested from the area affected (at an appropriate time of the year) prior to the works commencing.

24.6.31 There are two appropriate methods for re-seeding:

- Hay strewing: Hay that is cut and collected, with minimal turning, from local donor sites after flowering will contain seeds from many of the plants present. Most grassland species set seed between June and August. Cutting in early June should mean that most of the seeds are still attached. A second cut would catch later seeding species. Actual timing of cuts will depend on location and species composition. More seed may be lost when collecting using a forage harvester than with hay making, but the choice of method will depend on the availability of machinery. The hay should be spread as soon as possible after its collection to minimise seed loss to rot during storage (After Minerals 2010).

- Seeding: Seeds may be collected from the proposed development site in advance, from a local donor site using a brush harvester, or acquired from commercial sources. It should be ensured the seeds have native provenance and are from a local source. Only a restricted range of species is commercially available and therefore these can be used as a starter sward, as other species will colonise over time (After Minerals 2010).
- 24.6.32 This approach will require a detailed plan for harvesting, cleaning and storing seed from adjacent areas (brush harvester can work well and is regularly used by Weald meadows initiative) or harvesting hay (with seed) just before reinstatement. The timing of reinstatement will influence which method is preferred. Hay cannot be stored for any length of time (must be strewn immediately after harvest) or seeds will die due to microbial activity.
- 24.6.33 The overall method statement for reinstatement of this area will be agreed with WSCC.
- 24.6.34 The construction methodology for the chalk grassland areas on Tottington Mount is complex and has been described in Section 2b.5 'Crossing of Chalk Grassland'. The working methodology for the chalk grassland sections will be agreed with the SDNPA.
- 24.6.35 Designed-in mitigation for Tottington Mount has included modifying the construction method through Section TM2 so that only four approximately 1m wide strips of chalk grassland above each trench are directly removed. In addition, using bog matting or similar temporary surfacing for the haul road and either side of the trench has also been designed-in for this section. For Section 3 the designed-in mitigation has included reducing the impacted area to between 6m and 12m (final method yet to be decided).
- 24.6.36 The proposed technique for removing the areas of chalk grassland within the working width for Section TM2 is through turving. The turves would be removed in large sections and reinstated back in the same position on the ground after the work is complete. Each turf section will be up to 1.0m x 1.2m in area, cut in depths of up to 300mm and laid either side of the working width in single layers. Turves will be stored on a porous geotextile membrane as close as possible to the trench.
- 24.6.37 The construction programme in this area will be kept to a minimum to reduce the length of time the turf/topsoil is stripped. In addition, the installation of the cables in the ducts will be sequenced to follow on immediately after the ducts are installed to allow closure of the haul road and the final replacement of the turf/topsoil.
- 24.6.38 In all areas of chalk grassland on Tottington Mount a compromise has been made between reducing the working width as far as possible to minimise the impact to the chalk grassland and retaining enough space to be able to store the removed turves in a single layer within the working width (to avoid the requirement for any transportation of the turves).

24.6.39 Turfing will greatly minimise the impact to chalk grassland at Tottington Mount by enabling quicker reinstatement and retaining the natural seed bank and topsoil mix; however it will not eliminate all the impacts. Impacts associated with shading and compaction of adjacent areas of chalk grassland where turves have been stored will remain. There will also be a residual risk that turves will not reinstate properly or that indirect impacts such as settlement in the trench area, changing soil conditions and plant death leading to areas of bare ground and increased erosion will occur. Turf shrinkage would result in some bare turf shortfall areas that may require seeding treatments to enhance vegetation development. In Section TM3, which is approximately 100m in length and up to 12m wide, it may be necessary to excavate the trenches without topsoil/turf removal due to health and safety implications associated with the gradient of this section. The mitigation proposed for chalk grassland here, in addition to minimising the working width as far as possible, will be to harvest seed from the area prior to construction commencing and re-seed the working width post construction.

24.6.40 Post-construction monitoring will be undertaken at Tottington Mount to assess the success and survival of chalk grassland turves and re-seeded areas and to identify any additional post reinstatement management and aftercare that may be required to control such issues as increased weed populations or to carry out re-vegetation of bare areas.

24.6.41 The post-construction monitoring strategy will be formulated following consultation with stakeholders including the SDNPA. The duration of monitoring will be five years post-construction.

Marshy Grassland and Swamp

24.6.42 The working area at *Target Note 162* will be sided to the east of the easement to minimise the impact to an area of high value marshy grassland.

24.6.43 In this area additional consideration will be given for the use of bog matting, preferable in the form of aluminium rafts rather than typical bog mats made from 5m-wide timber boards, for the running track. This would result in fewer disturbances to the habitats underneath.

24.6.44 For the sections where disturbance cannot be avoided (i.e. the cable trench) topsoil will be removed, stored and reinstated and the area left to recover naturally.

Coastal Shingle

24.6.45 The impact of light plant on vegetated areas will be minimised by reducing the width of the access track to the foreshore as far as possible and using light machinery only. In addition, aluminium matting will be laid on the foreshore during landfall operations to further protect the vegetated areas.

Saltmarsh

- 24.6.46 The River Adur will be crossed using HDD to avoid impacts to the adjacent saltmarsh area and the river itself.

Rivers, Streams and Ditches

- 24.6.47 Crossing points will be chosen within the Development Area to minimise impacts and preserve valuable features as far as possible. Bank-side vegetation will be retained, with trees and shrubs coppiced rather than grubbed-out where practicable. Bank and bed materials removed for construction will be stored separately and replaced in the reverse order in which they were removed, to promote the re-establishment of appropriate habitat. Trees and shrubs will be replanted and the reinstated areas will be fenced off to prevent damage (including poaching) by livestock. Geotextile matting will be used, wherever necessary, to reinforce banks during reinstatement.

- 24.6.48 The timing of the works will be carefully selected and periods of low flow will be chosen wherever practicable.

- 24.6.49 The working width will be reduced to 20m at the following watercourse crossings;

- Stream north of Truleigh Sands (*Target Note 139*);
- Stream north of Truleigh Sands (*Target Note 141*);
- Stream south of Morley Farm (*Target Note 187*);
- Herrings Stream – crossing 1 (*Target Note 222*); and
- Herrings Stream – crossing 2 (*Target Note 246*).

- 24.6.50 Measures to minimise impacts due to sediment release or pollution will be implemented and open-cut crossings will be completed in the shortest time possible.

Ponds

- 24.6.51 In general ponds have been avoided during the routing process. Where this has not been possible and ponds fall within the working width (i.e. at Old Erringham Farm Valley and Road Cutting SNCI) they will be fully reinstated after construction. One pond at *Target Note 297b* is situated on the edge the working width but the working area will be reduced at this location and the pond fenced off to prevent any damage.

- 24.6.52 No supplementary planting is proposed for any ponds and natural re-colonisation of aquatic plants should be allowed.

- 24.6.53 It is proposed that the three derelict ponds at Old Erringham Farm Valley and Road Cutting SNCI are reinstated, this is in agreement with WSCC ecologists.

Arable Habitats

- 24.6.54 All arable fields will be reinstated to the same condition.

Semi-urban Habitats

- 24.6.55 All amenity grassland will be reinstated to the same condition. Areas of shrub and ornamental trees will be reinstated with semi-mature stock matching what has been removed.

Notable Plant Species

- 24.6.56 Mitigation measures described in Section 24.6 'Construction - Old Erringham Farm Valley and Road Cutting SNCI and A283 Steyning Road Notable Verge, paragraph 26.6.8' will minimise impact to the UK BAP Priority Species Red Star-thistle.
- 24.6.57 Mitigation measures described in Section 24.6 'Construction – Grassland, paragraph 24.6.27' will minimise impact to the Nationally Scarce Rye Brome.
- 24.6.58 Mitigation measures described in Section 24.6 'Construction – Grassland, paragraph 24.6.28 and paragraphs 24.6.29 to 24.6.38' will minimise impact to the Nationally Scarce Round-headed Rampion.
- 24.6.59 Mitigation measures described in Section 24.6 'Construction – Coastal Shingle, paragraph 24.6.42' will minimise impact to the Nationally Uncommon Rough Clover present on the coastal shingle.

Invasive Plant Species

- 24.6.60 Owing to the presence of invasive plant species along the proposed cable route an Invasive Species Management Plan will be prepared prior to construction and implemented in the highlighted areas. All mitigation measures outlined in this plan will be agreed with the EA. This is discussed in further detail in Section 20 (Agriculture and Soils).

Badger

- 24.6.61 Badgers are highly mobile species and can occupy their setts at different times over a number of years and seasons.
- 24.6.62 Owing to the length of time before construction commences all identified setts will be re-surveyed in a pre-construction walkover survey in order to assess their status and current use. Following this survey a method statement will be prepared and submitted to NE detailing outline construction methods to inform whether a disturbance licence will be required. The pre-construction walkover survey will also allow any newly excavated setts to be identified.

- 24.6.63 Licences allowing works to proceed close to active Badgers setts, as works that would cause disturbance as defined by NE, will be acquired. Licences for disturbance are normally only issued for the period 1 July – 30 November and any deviation from this period would need to be discussed and agreed with NE in advance of submitting the licence application.
- 24.6.64 During construction, Badgers will be prevented from accessing the working width (and the trench during the brief period that it is open) by stock-proof fencing which will be erected either side of the working width. In areas of high Badger activity, ramps will be installed when the trench is left open overnight to ensure that in the unlikely event that Badgers gain access into the working width/trench there is a means of exiting the trench available.
- 24.6.65 Setts 10 and 13 are situated on the edge of the proposed works area. In both locations the easement and/or working area will be micro-sited to avoid the need to close either sett. Owing to the proximity of Sett 10 to the cable works area a trial trench will be dug at the closest proposed trench line prior to construction to ensure that no sett tunnels extend towards the trenching areas.
- 24.6.66 The hedgerow in which Sett 13 is located will be retained and therefore potential dispersal routes and foraging areas to the east of the proposed substation will not be impacted.
- 24.6.67 As a result of the current location of the proposed cable route, Badgers will need to be excluded from Sett prior to works starting. Controlled exclusion will be carried out, under licence from NE, to ensure that no Badgers remain in the sett at the time of construction. This would involve the use of one-way gates on the sett entrance and a monitoring period of at least three weeks. Once sure that the sett is empty, works could then proceed. It should be noted that Sett 5 is an annex sett which is close to a main sett and in an area of high Badger activity.

Bats

Roosting Bats

- 24.6.68 Unnecessary loss of trees will be avoided as much as possible through cable route refinement and reducing the working width. However, impacts associated with the loss of bat roosts may occur along the proposed cable route. The following mitigation strategy will be employed to minimise impacts for roosting bats during construction of the cable.
- 24.6.69 Trees to be removed, with Category 1 features:
- Inspect features using ladders or tree climbing equipment (any time of the year);
 - If no bats or evidence of bats is found then the features could be blocked (providing all aspects of the feature can be fully inspected);

- Where it is not possible to access Category 1 features by climbing, it may be possible to carry out work on the tree in a careful way in the presence of a bat ecologist (as a precautionary measure); and
- If bats or signs of bats are found in any of the features, an EPS licence will be necessary to work on or remove the trees.

24.6.70 Trees to be removed, with Category 2 and 3 features:

- Inspect features using ladders or tree climbing equipment (this is best done during late summer or early autumn for fresh evidence and more reliable results);
- Where it is not possible to access features by climbing, conduct emergence surveys during the summer months to confirm presence or likely absence of bats;
- Retain features which might be lost due to pruning or felling by re-attaching to trees or alternatively erecting bat boxes in the surrounding area to compensate for the overall loss of roosting habitat; and
- If bats or signs of bats are found in any of the features, a EPS bat development licence will be necessary to work on or remove the trees.

24.6.71 If roosts are identified, and destruction cannot be avoided, further surveys may be necessary to inform the EPS licensing process. Should this occur it will result in a permanent negative impact upon the bat population which, depending upon the bat species and number of individual bats/roosts affected could be significant up to the County level.

24.6.72 The BCT Guidelines (BCT 2007) recommend that when a tree with high potential to support roosting bats is felled, a bat box should be erected on a nearby tree. It should be assumed that a tree with high potential to support roosting bats may be used by bats at some point even if no bats have been recorded using it during the surveys. It is therefore recommended that before any trees which are classified as Category 1, 2 or 3 in terms of their bat roost potential are felled, a Schwegler 1FF bat box should be erected on a nearby tree. This will help to compensate for the potential roost lost and help to ensure the potential roost 'stock' of an area is not decreased as a result of the works. Schwegler 1FF bat boxes are known to be used by a variety of bat species and are also unlikely to be used by nesting birds which can out-compete bats for bat boxes during the nesting bird season.

Commuting and Foraging Bats

- 24.6.73 To compensate for the removal of sections of hedgerows along the route, once the ground works have finished, all gaps will be planted up using native shrubs and trees of local provenance. It will take approximately three years before a hedgerow becomes full established. Therefore, there will be a potential decrease in insect biomass for three years following the severance.
- 24.6.74 All the hedgerows which were surveyed had different levels of bat activity. The 15 locations along hedgerows with more than 200 bat passes are important hedgerows for foraging and commuting bats. Of these 15 hedgerows, 11 are crossed by the proposed cable route. Therefore the gaps within these 11 hedgerows will be planted up with more mature stock of shrubs and young trees. This will help reduce the length of time that insect biomass is reduced along a hedgerow.
- 24.6.75 At the 11 hedgerows crossed by the proposed cable route and important for foraging and commuting bats, the hedgerows will ideally be left to become overgrown for a length of at least 15m either side of a created gap. Subject to landowner approval, the hedgerows will be left uncut for a period of at least 1 year prior to the hedgerow severance. The overgrown hedgerow would increase the insect biomass of the hedgerow and help to compensate for the loss of hedgerow section when the hedgerow is severed.
- 24.6.76 To help temporarily compensate for the loss in connectivity along a gap in a hedgerow and also to provide cover and protection from predation, bales of dead hedging material or similar will be installed within the gaps along the hedgerow. These will be removed during the day and be installed across the length and width of the gaps at night.
- 24.6.77 The above mitigation measures will be applied to the temporary hedgerow breaches at the proposed substation area. To mitigate for the permanent loss of hedgerows at the proposed substation, compensatory planting will occur at two locations to the north and east of the proposed substation (see Section 26 Landscape and Visual). Careful consideration will be given to the location of the compensatory planting to ensure that the connectivity of the local area will be maintained. There could however be a residual temporary impact to foraging and commuting bats in this area while they become accustomed to the minor changes to the landscape around the substation.
- 24.6.78 To prevent the potential reduction in available foraging opportunities and access to roosting sites for bats as a result of lighting impacts, work on the trenching and duct installation will be restricted to between 7am and 7pm. It is however possible that 24 hour working involving lighting will be used for the relatively small number of HDD operations. Of the fifteen locations with high numbers of bats, only bat activity survey point 9 has the potential to be affected by 24 hour HDD operations. At this location a specific lighting strategy will be prepared and agreed with WSCC.

Dormouse

- 24.6.79 Given the proximity to a known population of Dormice, a precautionary mitigation approach will be implemented with presence assumed at the two adjacent connected hedgerows which could not be surveyed due to health and safety issues associated with the presence of bulls in both fields.
- 24.6.80 In order to avoid significant impacts on Dormouse as a result of the hedgerow severance the proposed cable will have a reduced working width of 20m at these two hedgerow crossing points.
- 24.6.81 Vegetation at the two crossing points will be coppiced to ground level under a licence from NE and under the supervision of a suitable qualified ecologist between November and March inclusive. This will avoid the majority of the period when Dormice might be found in nests above ground. Clearance will be done by hand and in a sensitive manner, to minimise the likelihood of disturbing or killing hibernating Dormice.
- 24.6.82 The felled stems and any leaf litter present will be searched again prior to the preparation of the working width by a suitably qualified ecologist.
- 24.6.83 If, due to construction timetables, it is not possible to clear the vegetation at these hedgerow breaches between November and March then summer clearance will be undertaken. This will involve taking out small amounts of vegetation on successive days, ideally between May and late September, in the presence of an ecologist who will carry out a search for nests immediately beforehand.
- 24.6.84 Final mitigation measures will be outlined in a Method Statement and agreed with NE as part of the application process for the necessary EPS licence to undertake habitat management work.
- 24.6.85 In addition, hedgerow breaches in these locations will be replanted with semi mature stock to ensure that connectivity is restored as quickly as possible. To help temporarily compensate for the loss in connectivity along the two hedgerows, bales of dead hedging material or similar will be installed within the gaps along the hedgerow during the Dormouse active season to facilitate movement between areas of potential habitat. These will be removed during the day and will be installed across the length and width of the gaps at night.

Great Crested Newt (GCN)

- 24.6.86 There are five discrete areas along the proposed cable route where GCN breeding ponds are present within a 250m radius of the working width. A translocation programme will be implemented for the working width in these areas. This will involve the installation of amphibian-proof fencing around the working width and using pit-fall trapping and carpet tiles to catch and remove all GCN's. This will take place during suitable conditions in the newt active season April-October inclusive for a period of time appropriate to the population size. Translocated newts will be transported to suitable habitat at least 50m away from construction works. These receptor sites have been identified and are currently being discussed with landowners. They will be subject to minor enhancement prior to any translocation programme starting in order to help support the temporary increase in numbers. The locations and enhancements will be discussed with NE directly.
- 24.6.87 To ensure that newts are kept out of the working width once the translocation is complete and works are ongoing, the amphibian-proof fence will extend further out into unsuitable habitat at both ends, on the basis that newts will not travel into these areas and therefore a suitable barrier will be formed. In addition, a return will be incorporated at both ends of the fencing and pit fall traps will be placed at the end of the return so that in the unlikely event that newts travel along the edge of the fencing they will be intercepted before they can enter the working width. These will be checked every morning and evening by suitably trained staff. All amphibian-proof fencing will remain in place until the works are complete in that area and the ground is remade.
- 24.6.88 One additional area was identified along the proposed cable route where a GCN breeding pond was present right on the extreme edges of the 250m distance at which newts are likely to be found from those ponds in their terrestrial phase. The population level in this pond was also low. The risks of GCN being in the working width of areas are therefore extremely low. The size of the areas affected is also very small and a GCN.
- 24.6.89 An ecologist will oversee works in this area and perform a fingertip search prior to works starting. In addition, no materials will be stored on the ground in this area for a significant length of time as this could form resting areas for newts. Any newts found would be moved to a place of safety nearby. Once the area has been stripped to below topsoil level no further actions will be needed.
- 24.6.90 If any newts are found during works on other parts of the route then an ecologist will be called to site immediately to assess the situation and advise on a course of action.

24.6.91 Mitigation for the permanent loss of approximately 7ha of GCN terrestrial habitat at the proposed substation will include compensatory planting positioned in areas which maximise connectivity to the wider landscape. The newly planted area to the east of Twineham Court Farm (see Figure 26.6 in Section 26 Landscape and Visual) will provide an important ecological link to the east where there are a number of suitable ponds which have yet to be colonised by GCN. This will help to ensure the long term viability of the high population of GCN at *Pond 142*. However, there will be a short term (1-2 years) impact on dispersal routes in this area whilst the compensatory planting matures and therefore additional habitat enhancement involving erecting hibernacula within the woodland surrounding *Pond 142* is proposed.

24.6.92 Long-term mitigation for the site could also include permanent amphibian-proof fencing to be installed around the substation to prevent GCN from wandering into the substation footprint and potentially coming to harm. This would also allow any ground disturbance works essential to the running of the substation to go ahead in future without potentially time-consuming and costly mitigation for GCN.

Nesting Birds

24.6.93 Measures will be undertaken to minimise the likelihood of disturbance, injury or mortality of nesting birds, their eggs and chicks.

24.6.94 Wherever possible, vegetation which will be directly impacted by construction and that could be used by nesting birds will be removed outside of the March–July bird nesting season (particularly sections of hedgerow, scrub, tree lines and woodland).

24.6.95 At locations where hedgerow removal during the breeding season is unavoidable, surveys will be undertaken immediately prior to habitat removal to confirm that there are no occupied nests. Should any occupied nests be identified, an appropriate buffer zone (determined on the basis of the species concerned and the location of the nest in the context of the surrounding vegetation, but no less than 5m) will be retained until the chicks have fledged.

24.6.96 Grassland restoration measures will achieve the restoration of nesting habitat for ground-nesting species after the completion of works.

24.6.97 Potential impacts on migrating Nightjars as a result of lighting impacts will be avoided by work on the trenching and duct installation being restricted to between 7am and 7pm. It is however possible that 24 hour working involving lighting will be used for the relatively small number of HDD operations although only one main HDD location is within a rural setting (River Adur crossing). A lighting strategy will be prepared and agreed with WSCC to minimise light spill at this location.

- 24.6.98 The cable easement at Tree 1837 will be micro-sited to the east and the tree will be fenced off to avoid any impact to the tree. Further surveys will be undertaken prior to construction to confirm whether nesting Barn Owls are present in Tree 1837 or any of the other Barn Owl boxes along the route. If nesting Barn Owls are present, the RSPB and NE will be contacted to discuss the proposed methodology and working practice for each stage of construction and agree any further mitigation which may be required.
- 24.6.99 It may be possible, subject to landowner agreement, to temporarily close any Barn Owl boxes which are close enough to the works area for any Barn Owls using them to experience disturbance. This approach would only be undertaken where the boxes were clearly not in use.
- 24.6.100 The potential for disturbance to other notable/Schedule 1 species, including Little Egret, Long-eared Owl and Stone Curlew will depend upon up to date information on the location of breeding sites and the critical time periods for each species. Further consultation with the RSPB and NE will be undertaken to highlight potential risk areas and times of the year and to discuss the proposed methodology/working practice for these areas at each stage of construction and agree any further mitigation which may be required.

Reptiles

- 24.6.101 To minimise any potential impact to reptiles, the working areas where reptiles have been recorded in low numbers (this includes the satellite compound area north of Tottington Mount) will be made unsuitable prior to any works commencing by reducing cover as much as possible (by mowing or strimming to 10mm above ground-level) to discourage reptiles from the area. These sections will then be left for one week to allow reptiles to move out of the area. Sections of hedge that are to be removed to facilitate construction will be coppiced using hand tools to prevent injuring any reptiles resting at the bases. Vegetation bases will only be removed once the area has been deemed clear of reptiles. These processes will be undertaken under a watching brief by a suitably qualified ecologist and any reptiles found will be transported to suitable habitat at least 50m away from construction works. These receptor sites have been identified and are currently being discussed with landowners. They will be subject to minor enhancement prior to works commencing in order to help support the temporary increase in numbers. The locations and enhancements will be discussed with NE directly.

24.6.102 In addition five areas were highlighted on the route where notably higher numbers of reptiles were recorded. A reptile translocation programme will be implemented at three of these locations, including the disused allotment area south of the railway, Old Erringham Farm Valley and Road Cutting SNCI and an area of marshy grassland south of the Alders, Woodmancote. To ensure that reptiles are kept out of the working width once the translocation is complete and works are ongoing, the reptile-proof fence will extend further out into unsuitable habitat at both ends, on the basis that reptiles will not travel into these areas and therefore a suitable barrier will be formed. In addition, a return will be incorporated at both ends of the fencing and felt tiles will be placed at the end of the return so that in the unlikely event that reptiles travel along the edge of the fencing they will be intercepted before they can enter the working width. These will be checked every morning and evening by suitably trained staff. All reptile-proof fencing will remain in place until the works are complete in that area and the ground is remade.

24.6.103 At the remaining two locations the areas concerned are very small (and in one case may not be affected) and therefore it is inappropriate to implement a translocation program here. At these areas a thorough hand search followed by strimming to dissuade reptiles from the area will be undertaken pre-construction.

Terrestrial Invertebrates

24.6.104 The mitigation measures described for individual habitats along the route will consequently reduce general impacts on terrestrial invertebrates and achieve restoration of their habitats.

24.6.105 Mitigation measures for the target butterfly species (Adonis Blue, Small Blue and Chalkhill Blue) have included re-routing the cable route, where possible, in specific areas (i.e. Applesham Farm Bank SNCI) and or identifying specific chalk grassland areas and highlighting them as 'no go' areas during construction (i.e. the chalk grassland embankment at Old Erringham Farm Valley and Road Cutting SNCI). However at Tottington Mount the food plants of the Adonis Blue butterfly are widely scattered and local in the area so that specific points of interest cannot be defined. A modification of the route is thus unlikely to reduce the losses that might potentially be sustained by local populations of the Adonis Blue butterfly here.

24.6.106 It is likely that advance removal and subsequent replacement of turf will minimise losses of food plant and habitat, although it should be remembered that the caterpillars of this butterfly have an obligate relationship with ants and that, consequently, the survival of ants is of paramount importance.

Aquatic Invertebrates

24.6.107 General mitigation measures put in place to minimise impacts at watercourse crossings will consequently reduce the disturbance to aquatic macro-invertebrates present.

Fish

24.6.108 At watercourse crossing points, works will be undertaken as quickly as possible therefore, impacts will only be significant at the local level during construction and for a period when sediments settle. However, no long-term impacts are predicted.

24.6.109 Detailed mitigation measures will be agreed with the relevant authority in consultation with the EA before work commences, however it is likely to include the following at open cut watercourse crossings:

- Crossing points will be chosen within the Development Area to minimise impacts and preserve valuable features as far as possible;
- Measures to minimise impacts due to sediment release or pollution will be implemented, with adherence to the relevant EA Pollution Prevention Guidelines during construction;
- Open-cut crossings will be completed in the shortest time possible, generally in a single day;
- Full passage of fish will be maintained as far as possible; and
- Where intensive in-river works are planned in sensitive fish areas a fish rescue may be required by the EA. Further consultation will be undertaken with the EA to determine specific requirements.

During Operation

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

During Decommissioning

24.6.111 During decommissioning of the cable the ducts will remain in position and therefore mitigation would relate to those areas where the cable will be pulled from the ducts. Mitigation measures at these specific location are likely to be similar to that during construction. Any new legislation or guidelines published prior to decommissioning will be adhered to and incorporated into mitigation design prior to any decommissioning taking place.

24.7 Significance of Residual Effects

During Construction

24.7.1 Residual effects for habitats and species groups are summarised in Table 24-7.

During Operation

- 24.7.2 There are no significant residual effects associated with the operation of the proposed cable route or substation.

During Decommissioning

- 24.7.3 Onshore cables will be left buried in situ, unless lifted to be replaced by new cables to be run along the same route as part of future developments or wind farm re-powering. It is likely that ducting will remain in place; however, the cables may be pulled out of the ducts via the jointing bays. Impacts at these specific locations will be similar scale to impacts described in this section for construction.
- 24.7.4 The onshore substation may continue to be used as a substation site after the Project has been decommissioned. If it were to be dismantled it is not believed that any significant residual effect to the surrounding ecological receptors will occur.

24.8 Cumulative Impacts

- 24.8.1 The following planned developments are noted in the vicinity of the proposed cable route:
- A college and residential development 1km west of the proposed cable route as it passes through Sompting;
 - Thirteen employment units in 4 blocks within an industrial estate 800m to the east of the proposed cable route close to the landfall location;
 - Construction of a training ground and football academy approximately 2km east of the proposed cable route near North Lancing; and
 - The redevelopment of redundant land to provide 197 dwellings, approximately 2km south-east of the proposed cable route.
- 24.8.2 Out of these developments only the proposed training ground and football academy appears to result in a loss of any natural (grassland) habitat, all others are situated within previously developed areas. This area of grassland is connected to the proposed cable route working area through the railway line only, as a large residential area lies between the sites. The area affected by this planned development is small and likely to be of low ecological value considering its location at the edge of a large residential area.
- 24.8.3 Therefore, it has been assessed that there are no significant cumulative impacts associated with the development of this site, nor any other planned developments highlighted above.

- 24.8.4 In addition to the planned developments detailed above, there is an Environment Agency-led project in development that is focused on restoring the Teville Stream. This restoration project is currently in development but could be constructed between 2012 and 2013. The proposed works include creating a new open channel between the proposed Teville stream cable crossing at *Target Note 51* and the railway. The proposed cable route has been re-routed to avoid any damage to the new channel.
- 24.8.5 In general, the proposed Teville Stream restoration measures would improve the ecological interest of this area in the long term. However, there would be a temporary, negative, cumulative impact on areas of semi-improved neutral grassland as a result of the combined effect of constructing the cable route and the new channel at separate times.
- 24.8.6 The following planned developments are noted in the vicinity of the proposed substation:
- Modifications to the existing National Grid Bolney substation (associated with Rampion connection).
 - Modifications to the existing National Grid Bolney substation (not associated with Rampion).
- 24.8.7 Four 400kV feeder bays are required within the National Grid Electricity Transmission (NGET) substation compound at Bolney to connect the new Rampion substation to the existing NGET Bolney substation. Recent discussions between National Grid and E.ON have indicated that these works would fall outside NGET's permitted development rights and therefore planning consent would be required, E.ON intends to apply for planning permission from Mid Sussex District Council.
- 24.8.8 It is understood that National Grid will undertake the works not associated with Rampion as Permitted Development with pre-application consultation with the LPA expected in 2013.
- 24.8.9 As a result of these works at Bolney there will be a cumulative impact on terrestrial GCN habitat in the vicinity of the proposed substation. Discussions are ongoing with National Grid and mitigation measures for Great Crested Newt will be carefully designed to ensure that they provide a joined up approach particularly with regard to potential dispersal routes from *Pond 142* where there is a high population of the species present. With the implementation of a coordinated mitigation strategy there should be no significant cumulative impacts.

Table 24-7: Summary of Residual Effects

Ecological Receptor	Impact	Proposed Mitigation Measures	Intrinsic Value in Context of Development Area	Duration of Impact (<1yr, 1-2 yrs, 2-5 yrs)	Likelihood of Impact	Significance of Residual Effect
South Downs National Park	Habitat/species loss	Associated with specific habitats and species	National	Temporary (2-5 yrs)	Certain	Significant negative impact at district level
Beeding Hill to Newtimber Hill SSSI	Monitoring	Provision of monitoring data from Tottington Mount to Natural England annually	Site	Temporary (2-5 yrs)	Certain	Significant beneficial impact at a site level
Applesham Farm Bank SNCI	Habitat loss	Removal of encroaching scrub on chalk grassland slopes	Site	Temporary (2-5 yrs)	Certain	Significant beneficial impact at a site level
Old Erringham Farm Valley and road cutting SNCI (and A283 Steyning Rd NV)	Habitat loss	Seed harvest from Notable Verge, protecting track, removal of scrub from chalk embankments, reinstatement of derelict ponds, protection of high value trees	County	Temporary (1-2 yrs)	Certain	Significant beneficial impact at a county level
Lower Cokeham reedbed and ditches SNCI	Pollution/ Hydrological changes	Implementing pollution prevention measures and ensuring the natural hydrological regime is maintained	Site	Temporary (<1 yr)	Unlikely	Not significant at any level
Ancient Semi-Natural Woodland	Habitat loss	Avoiding tree loss. Implementing tree protection measures	Local	Permanent	Unlikely	Not significant at any level
Woodland, scrub and trees	Habitat loss	Implementing tree protection measures. Replanting any lost trees at a 2 for 1 ratio	Local	Permanent	Certain	Significant negative impact at local level

Ecological Receptor	Impact	Proposed Mitigation Measures	Intrinsic Value in Context of Development Area	Duration of Impact (<1yr, 1-2 yrs, 2-5 yrs)	Likelihood of Impact	Significance of Residual Effect
'Important' Hedgerows	Breaches in hedgerow	Replacement like for like. Use of geotextile membrane for the running track	District	Temporary (2-5 yrs) although potentially permanent with regard to understory species.	Certain	Significant negative impact at local level
'Not Important' hedgerows	Breaches in hedgerow	Replacement like for like	Local	Temporary (2-5 yrs)	Certain	Significant negative impact at local level
Agricultural grassland	Habitat loss	Reinstated with supplementary seeding	Site	Temporary (< 1yr)	Certain	Not significant at any level
Unimproved and semi-improved neutral grassland	Habitat loss	Topsoil stripping to retain seed bank, reinstated in same condition and left to regenerate naturally. Seed harvest at the temporary access road for the proposed substation	Local	Temporary (< 1yr)	Certain	Not significant at any level
Calcicolous Grassland	Habitat loss	Topsoil stripping, seed harvest and reinstatement at Lambleys Barn. Turfing of chalk grassland areas on Tottington Mount and seed harvest Five year monitoring and aftercare programme for Tottington Mount (subject to a Project Reinstatement Plan to be agreed with SDNPA).	County	Temporary (2-5 yrs)	Certain	Significant negative impact at county level
Marshy Grassland and Swamp	Habitat loss	Reducing impact by micro-siting of working area. Topsoil stripping to retain seed bank, reinstated in same condition and left to regenerate naturally	District	Temporary (1-2 yrs)	Certain	Not significant at any level
Coastal Shingle	Habitat loss	Restricted access for vehicles to the foreshore and use of aluminium matting.	Local	Temporary (< 1yr)	Unlikely	Not significant at any level

Ecological Receptor	Impact	Proposed Mitigation Measures	Intrinsic Value in Context of Development Area	Duration of Impact (<1yr, 1-2 yrs, 2-5 yrs)	Likelihood of Impact	Significance of Residual Effect
Saltmarsh	Habitat loss	Using HDD	Local	N/A	Certain	Not significant at any level
Rivers & Streams	Habitat loss/pollution	The River Adur will be crossed by HDD. Careful selection of crossing points. Minimising working width to 20m at crossing points.	Up to County	Temporary (1-2 yrs)	Certain	Significant negative impact at local level
Ditches	Habitat loss/pollution	Careful selection of crossing points.	Local	Temporary (1-2 yrs)	Certain	Not significant at any level
Ponds	Habitat loss	Reinstatement of derelict ponds at Old Erringham Farm Valley and Road Cutting SNCI	Local	Temporary (1-2 yrs)	Certain	Significant beneficial impact at a local level
Arable	Habitat loss	Reinstatement of fields	Local	Temporary (< 1yr)	Certain	Not significant at any level
Semi-urban habitats	Habitat loss	Reinstatement of grassland and new planting	Site	Temporary (< 1yr)	Certain	Not significant at any level
Notable Plant Species (combined)	Loss of individual plants	Mitigation measures associated with habitat type or specific site	National	Temporary (2-5 yrs)	Unlikely	Significant negative impact up to a county level
Invasive Species (combined)	Spread of invasive plants	An Invasive Species Management Plan will be developed to manage risks associated	-	N/A	Unlikely	Not significant at any level
Badger	Damage to setts/disturbance of individuals	NE disturbance licence and sett closures	Local	Permanent	Certain	Significant negative impact at a local level

Ecological Receptor	Impact	Proposed Mitigation Measures	Intrinsic Value in Context of Development Area	Duration of Impact (<1yr, 1-2 yrs, 2-5 yrs)	Likelihood of Impact	Significance of Residual Effect
Bats	Loss of commuting / foraging habitat and loss of potential roost sites	Hedgerow breaches minimised and 'important bat hedgerows' left to become overgrown for at least a year before construction. Gaps to be planted with semi-mature stock and bales of dead hedging installed at gaps overnight. Bat boxes erected in replacement of any features lost through 'bat tree' removal. Compensatory planting at the proposed substation to retain habitat connectivity. A specific lighting strategy will be prepared and agreed with WSCC for the Sompting Bypass HDD if 24 hour working involving night lighting is required.	District	Temporary (2-5 yrs)	Certain	Significant negative impact at site level
Dormouse	Habitat loss/injury/disturbance of individuals	Hedgerow breaches where presence has been confirmed/presumed will be minimised and removed under licence. Dead hedging bales or similar will be used in the gaps.	County	Temporary (2-5 yrs)	Certain	Significant negative impact at site level
GCN	Habitat loss/injury of individuals	The working width will be fenced in areas and any newts captured will be translocated. Compensatory planting at the proposed substation to maintain and enhance dispersal routes.	District	Temporary (2-5 yrs)	Certain	Significant negative impact at local level
Nesting Birds	Habitat loss/injury/disturbance of individuals	Vegetation removal will be undertaken outside of the bird nesting season or under the supervision of an ecologist. A specific lighting strategy will be prepared and agreed with WSCC for the River Adur HDD if 24 hour working involving night lighting is required.	Local	Temporary (1-2 yrs)	Probable	Significant negative impact at local level

Ecological Receptor	Impact	Proposed Mitigation Measures	Intrinsic Value in Context of Development Area	Duration of Impact (<1yr, 1-2 yrs, 2-5 yrs)	Likelihood of Impact	Significance of Residual Effect
Nesting Birds (Schedule 1 species)	Habitat loss/disturbance of individuals	Pre-construction surveys. Further discussions with the RSPB and Natural England.	County	Temporary (1-2 yrs)	Unlikely	Significant negative impact at local level
Reptiles	Habitat loss/injury/disturbance of individuals	Hand searches or reptile translocations (depending on numbers present) to move individuals away work areas.	Local	Temporary (1-2 yrs)	Certain	Significant negative impact at local level
Terrestrial Invertebrates	Habitat loss/injury/disturbance of individuals	Replacement of chalk grassland turves at Tottington Mount.	National	Temporary (2-5 yrs)	Probable	Significant negative impact at local level
Aquatic Invertebrates	Habitat loss	Crossing points at water courses to be minimised. Any removed riverbed substrate to be left close to the side of the stream to enable invertebrates to crawl out and return to the stream.	Site	Temporary (< 1 yr)	Certain	Not significant at any level
Fish	Injury/disturbance of individuals	Adherence to PPG measures during construction. Maintain full passage of fish and discuss any fish rescue requirements with the EA.	District	Temporary (< 1 yr)	Probable	Not significant at any level

24.9 References

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