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Rampion 2 WIND FARM

Volume 4, Chapter 23

Terrestrial ecology and Nature Conservation Appendices

GoBe wood.

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Policy and legislation tables

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1. Introduction

1.1.1 **Table 1-1** provides relevant local policy to the Proposed Development associated with terrestrial ecology and nature conservation.

Table 1-1 Local planning policy relevant to terrestrial ecology and nature conservation

Policy description	Relevance to assessment
Adopted Arun Local Plan 2011-2031 (July 2018)	
Policy ENV SP1 Natural Environment states: *"Arun District Council will encourage and promote the preservation, restoration and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 17.1-17.7 that are recognised for the species and habitats contained within them."*	Designated sites lie close to or are crossed by the proposed onshore cable corridor. The likely significant effects resulting on these ecological features are assessed in **Volume 2, Chapter 23: Terrestrial ecology and nature conservation, Section 23.6: Scope of the assessment** and **23.10: Preliminary assessment**, alongside consideration of the embedded environmental measures described in **Section 23.8: Embedded environmental measures**.
Policy ENV DM1 Designated Sites of biodiversity or geological importance states: *"a. Proposed development likely to have an adverse effect on land with the designated features of any Site of Biodiversity or Geological Importance as listed in Tables 17.1 - 17.7 or any subsequently designated sites (either individually or in combination with other developments), will not normally be permitted. Consideration will be given to the exact designated features present on the site, their scarcity/rarity and recognition of the protection offered by their existing status. Development on wildlife sites with the highest value will only be permitted exceptionally where the following can be demonstrated: i. There is no alternative solution (which shall be adequately demonstrated by the developer). ii. There are reasons of public health or public safety or iii. There are benefits of primary importance to the environment or*	Designated sites lie close to or are crossed by the proposed onshore cable corridor. The likely significant effects resulting on these ecological features are assessed in **Volume 2, Chapter 23, Section 23.6** and **23.10** alongside consideration of the embedded environmental measures described in **Section 23.8**.

Policy description	Relevance to assessment
iv. There are imperative reasons of overriding public interest. Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined. *b. In determining any planning application affecting Sites of Biodiversity or Geological Importance the Council will ensure that the intrinsic natural features of particular interest are safeguarded or enhanced having regard to;* *i. The European, National or Local status and designation of the site;* *ii. The nature and quality of the site's features, including its rarity value;* *iii. The extent of any adverse impacts on the notified features of interest;* *iv. The need for compensatory measures in order to re-create remaining features of habitats on or off the site.* *c. Where appropriate the Council will ensure the effective management of designated sites through the imposition of planning conditions or Section 106 agreements as appropriate.*	
Policy ENV DM2 Pagham Harbour states *"a. Within Zone A (0-400m from the boundary) as identified on the Policies Maps, development will only be permitted in exceptional circumstances where the developer is able to demonstrate there will be no detrimental effects on Pagham Harbour, including non-native species and the water environment. Regard shall also be had to tests 1-4 as set out in Policy DM1 (Designated Sites of Biodiversity or Geological Importance).*	The potential effects on Pagham Harbour, and the mobile species it supports, due to proposed onshore cable corridor above MHWS have been scoped out of the assessment by the Planning Inspectorate and Natural England (RED, 2020).

Policy description	Relevance to assessment
b. Within Zone B (0-5km) for all new residential development and development which is likely to have an impact on Pagham Harbour will be required to: i. Make developer contributions towards the agreed strategic approach to access management at Pagham Harbour. ii. create easily accessible new green spaces for recreation within or adjacent to the development site. These shall be capable of accommodating the predicted increases in demand for local walking, including dog walking. Good pedestrian links shall be provided between housing areas and new and existing green space in order to discourage car use. *c. Major developments (as defined in the GDPO 1995 as amended) taking place outside Zone B and close to its boundary will be considered on a case by case basis to determine any potential effects on Pagham Harbour, and the need for any avoidance or mitigation measures."*	
Policy ENV DM3 Biodiversity Opportunity Areas states *"Development shall:* *a. Retain and sympathetically incorporate locally valued and important habitats, including wildlife corridors and stepping stones* *b. Be designed in order to minimise disturbance to habitats* *Development proposals that do not reasonably address opportunities for enhancing these through their design, layout and landscaping or access/management shall not be permitted. Where a development scheme would result in a habitat loss, mitigation measures will be proposed as part of the proposed scheme and such measures agreed with the Local Planning Authority prior to the determination of any planning application. Within Biodiversity Opportunity Areas (BOAs) identified on the Policies Maps or where likely to have an impact on species or habitats within the*	The approach to mitigation, compensation and enhancement is described in **Volume 2, Chapter 23, Sections 23.8** and **23.10**.

Policy description	Relevance to assessment
BOAs, any application for planning permission shall include a properly conducted survey of the presence of that species and habitat and impact(s) that development may have on the BOA."	
Policy ENV DM4 Protection of trees states: *"Development will be permitted where it can be demonstrated that trees protected by a Tree Preservation Order(s), (TPO) identified as Ancient Woodland, in a Conservation Area or contributing to local amenity, will not be damaged or destroyed now and as they reach maturity, unless development:* *a. Would result in the removal of one or more trees in the interests of good arboricultural practice. This shall be demonstrated by the developer following the advice of a suitably qualified person which shall be guided by BS 5837 (2012). Details of any advice received having regard to BS 5837 (2012) shall be submitted, in writing, as part of a planning application; or* *b. Would enhance the survival and growth prospects of other protected trees;* *c. The benefits of the proposed development in a particular location outweigh the loss of trees or woodland, especially ancient woodland. Where planning permission is granted in any of the above instances, conditions shall be used to ensure that, for any trees which are removed as part of a development, at least an equivalent number of a similar species and age (where practical) are planted on the proposed development site. Sufficient space for replacement trees to mature without causing future nuisance or damage shall be provided. The planting of new trees shall form an integral part of the design of any development scheme. Proper provision must be made for the protection and management of*	The design of the Proposed Development outlined in **Volume 2, Chapter 4: The Proposed Development** has avoided land take within any ancient woodland. Potential likely significant effects resulting on ancient woodland close to the construction site and operational infrastructure are assessed in **Volume 2, Chapter 23, Section 23.6** and **Section 23.10**. Embedded environmental measures are detailed in **Section 23.8**. Veteran trees have not yet been identified within the PEIR Assessment Boundary. Any veteran trees will be identified as part of an arboriculture survey in 2021. Embedded environmental measures in **Volume 2, Chapter 23, Section 23.8** provide methods for avoidance should they be needed.

Policy description	Relevance to assessment
trees or areas of woodland on-site when undertaking development. A management plan shall be provided as part of a planning application in accordance with BS 5837 (2012) in order to ensure that trees are adequately protected during development and appropriately maintained in the future. Conditions for the continued protection of trees on sites shall be included in any planning permission given. Where there are existing trees on or adjacent to a development site, developers shall be required to provide: *d. Land and tree surveys* *e. A tree constraints plan* *f. An arboricultural impact assessment to include a tree protection plan and arboricultural method statement These will ensure that development is planned to take a comprehensive view of tree issues at an early stage in the design process and that development works do not have a negative impact on existing trees.*	
Policy ENV DM5 Development and biodiversity Development states: *"schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement.*	The approach to mitigation, compensation and enhancement is described in **Volume 2, Chapter 23, Sections 23.8** and **23.10**.

Policy description	Relevance to assessment
Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person. All developments shall have regard to Natural England's standing advice for protected species."	
Adopted South Downs Local Plan 2014 - 2033 (July 2019)	
Strategic Policy SD9: Biodiversity and Geodiversity states: *"1. Development proposals will be permitted where they conserve and enhance biodiversity and geodiversity, giving particular regard to ecological networks and areas with high potential for priority habitat restoration or creation. Prior to determination, up-to-date ecological information should be provided which demonstrates that development proposals: a) Retain, protect and enhance features of biodiversity and geological interest (including supporting habitat and commuting routes through the site and taking due account of any use by migratory species) and ensure appropriate and long-term management of those features; b) Identify and incorporate opportunities for net gains in biodiversity; c) Contribute to the restoration and enhancement of existing habitats, the creation of wildlife habitats and the creation of linkages between sites to create and enhance local and regional*	The baseline environment is described in **Volume 2, Chapter 23, Section 23.5**, with the assessment described in **Sections 23.6** and **23.10**. Embedded environmental measures are described in **Section 23.8**. The design of the Proposed Development outlined in **Volume 2, Chapter 4** has avoided land take within any SSSIs or ancient woodland, and minimised overlap with notable ecological features wherever possible. The approach to mitigation, compensation and enhancement is described in **Volume 2, Chapter 23, Sections 23.8 and 23.10**.

Policy description	Relevance to assessment
ecological networks; d) Protect and support recovery of rare, notable and priority species; e) Seek to eradicate or control any invasive non-native species present on site; f) Contribute to the protection, management and enhancement of biodiversity and geodiversity, for example by supporting the delivery of GI and Biodiversity Action Plan targets and enhance Biodiversity Opportunity Areas (BOA); and *g) Comply with the mitigation hierarchy as set out in national policy.* *2. The following hierarchy of site designation will apply in the consideration of development proposals:* *a) Internationally Protected Sites, as shown on the Policies Map (SPAs, SACs and Ramsar Sites, or candidate and formally proposed versions of these designations): i. Development proposals with the potential to impact on one or more international sites(s) will be subject to a HRA to determine the potential for likely significant effects. Where likely significant effects may occur, development proposals will be subject to Appropriate Assessment ii. Development proposals that will result in any adverse effect on the integrity of any international site will be refused unless it can be demonstrated that: there are no alternatives to the proposal; there are imperative reasons of overriding public interest why the proposal should nonetheless proceed; and adequate compensatory provision is secured b) Nationally Protected Sites SSSI, NNRs, MCZ as shown on the Policies Map: i. Development proposals considered likely to have a significant effect on nationally protected sites will be required to assess the impact by means of an EIA ii. Development proposals should avoid impacts on these nationally protected sites. Development proposals where any adverse effect on the site's notified special interest features is*	

Policy description	Relevance to assessment
likely and which cannot be either avoided or adequately mitigated will be refused, unless the benefits of the development, at this site clearly outweigh the likely impact to the notified features of the site and any broader impacts on the network of nationally protected sites *c) Irreplaceable Habitats (including ancient woodland as shown on the Policies Map, and veteran trees): Development proposals which result in the loss or deterioration of irreplaceable habitats, including ancient woodland and veteran trees will be refused unless there are wholly exceptional reasons and a suitable compensation strategy exists d) Locally Protected Sites (Sites of Nature Conservation Importance (SNCI)/Local Wildlife Sites (LWS)/Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR and Local Geodiversity Sites (LGS)) as shown on the Policies Map: i. Development proposals considered likely to have a significant effect on local sites will be required to assess the impact by means of an Ecological Impact Assessment (EcIA) ii. Development proposals that will result in any adverse effect on the integrity of any local site which cannot be either avoided or adequately mitigated will be refused, unless exceptional circumstances outweighing the adverse effects are clearly demonstrated e) Outside of designated sites i. Development proposals should identify and incorporate opportunities to conserve, restore and recreate priority habitats and ecological networks. Development proposals should take opportunities to contribute and deliver on the aims and objectives of the relevant biodiversity strategies where possible."*	
Strategic Policy SD10: International Sites The Mens SAC, Ebernoe Common SAC and Singleton & Cocking Tunnels SAC	A bat survey programme is underway, with the majority of survey work proposed for 2021. A preliminary assessment on bats is

Policy description	Relevance to assessment
states: *"1. Development proposals on greenfield sites and sites that support or are in close proximity to suitable commuting and foraging habitat (including mature vegetative linear features such as woodlands, hedgerows riverine and wetland habitats) within the following ranges as shown on the Policies Map, should have due regard to the possibility that Barbastelle and Bechstein's Bats will be utilising the site. Such proposals will be required to incorporate necessary surveys and ensure that key features (foraging habitat and commuting routes) are retained, in addition to a suitable buffer to safeguard against disturbance45. a) 6.5km: Key conservation area – all impacts to bats must be considered given that habitats within this zone are considered critical for sustaining the populations of bats within the SACs; and b) 12km: Wider conservation area – significant impacts or severance to flightlines to be considered. 2. Proposed use or development of the tunnels comprising the Singleton & Cocking Tunnels SAC will be required to demonstrate that there is no adverse effect on the interest features, including hibernation habitat for Barbastelle and Bechstein's Bats, or on the integrity of the site. Arun Valley SPA 3. Development proposals on greenfield sites within 5km of the Arun Valley SPA, as shown on the Policies Map, will undertake an appraisal as to whether the land is suitable for wintering Bewick Swan. If it is suitable then surveys will be undertaken to determine whether the fields are of importance to the swan population. If so, appropriate alternative habitat would be required before development could proceed."*	provided in **Volume 2, Chapter 23, Section 23.10**. Embedded environmental measures are described in **Section 23.8**.
Development Management Policy SD11: Trees, Woodland and Hedgerows states: *"1. Development proposals will be permitted where they conserve and enhance trees, hedgerows and*	The design of the Proposed Development outlined in **Volume 2, Chapter 4** has avoided land take within any ancient woodland.

Policy description	Relevance to assessment
woodlands. 2. Development proposals that affect trees, hedgerows and woodland must demonstrate that they have been informed by a full site survey, including an Ecological Survey, Arboricultural Method Statement and associated Tree Protection Plan, and include a management plan. 3. The removal of protected trees, groups of trees woodland or hedgerows will only be permitted in exceptional circumstances and in accordance with the relevant legislation, policy and good practice recommendations. Where protected trees are subject to felling, a replacement of an appropriate number, species and size in an appropriate location will be required. 4. Development proposals must provide adequate protection zones and buffers around hedgerows and other woodland and trees to prevent damage to root systems and taking account of future growth. A minimum buffer of 15 metres will be required between the development and ancient woodland or veteran trees. 5. A proposed loss or damage of non-protected trees, woodland or hedgerows should be avoided, and if demonstrated as being unavoidable, appropriate replacement or compensation will be required. 6. Development proposals must demonstrate that appropriate protection measures are in place prior to any work on site throughout the development process as part of a comprehensive landscaping plan, and that suitable opportunities for the restoration, enhancement or planting of trees, woodland, and hedgerows are identified and incorporated. 7. Opportunities should be identified and incorporated for planting of new trees, woodlands and hedgerows. New planting should be suitable for the site conditions, use native species and be informed by and contribute to local character, and enhance or create new habitat linkages."	Potential likely significant effects resulting on ancient woodland close to the construction site and operational infrastructure are assessed in **Volume 2, Chapter 23, Section 23.6** and **Section 23.10**. Embedded environmental measures are detailed in **Section 23.8**. Veteran trees have not yet been identified within the PEIR Assessment Boundary. Any veteran trees will be identified as part of an arboriculture survey in 2021. Embedded environmental measures in **Volume 2, Chapter 23, Section 23.8** provide methods for avoidance should they be needed.

Policy description	Relevance to assessment
Horsham District Planning Framework (excluding the South Downs National Park) (2015)	
Policy 31 Green Infrastructure and Biodiversity states: "1. Development will be supported where it can demonstrate that it maintains or enhances the existing network of green infrastructure. Proposals that would result in the loss of existing green infrastructure will be resisted unless it can be demonstrated that new opportunities will be provided that mitigates or compensates for this loss, and ensures that the ecosystem services of the area are retained. 2. Development proposals will be required to contribute to the enhancement of existing biodiversity, and should create and manage new habitats where appropriate. The Council will support new development which retains and /or enhances significant features of nature conservation on development sites. The Council will also support development which makes a positive contribution to biodiversity through the creation of green spaces, and linkages between habitats to create local and regional ecological networks. 3. Where felling of protected trees is necessary, replacement planting with a suitable species will be required. 4. a) Particular consideration will be given to the hierarchy of sites and habitats in the district as follows: i. Special Protection Area (SPA) and Special Areas of Conservation (SAC) ii. Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) iii. Sites of Nature Conservation Importance (SNCIs), Local Nature Reserves (LNRs) and any areas of Ancient woodland, local geodiversity or other irreplaceable habitats not already identified in i & ii above. b) Where development is anticipated to have a direct or indirect adverse impact on sites or features for biodiversity, development will be refused unless it can be demonstrated that: i. The reason	The baseline environment is described in **Volume 2, Chapter 23, Section 23.5**, with the assessment described in **Sections 23.6** and **23.10**. Embedded environmental measures are described in **Section 23.8**. The design of the Proposed Development outlined in **Volume 2, Chapter 4** has avoided land take within any SSSIs or ancient woodland, and minimised overlap with notable ecological features wherever possible.

Policy description	Relevance to assessment
for the development clearly outweighs the need to protect the value of the site; and, ii. That appropriate mitigation and compensation measures are provided. 5. Any development with the potential to impact Arun Valley SPA or the Mens SAC will be subject to a HRA to determine the need for an Appropriate Assessment. In addition, development will be required to be in accordance with the necessary mitigation measures for development set out in the HRA of this plan."	
Draft Horsham District Local Plan 2019-2036 (2018)	
Policy 31 - Strategic Policy: Green Infrastructure and Biodiversity states: *"1. Development will be supported where it can demonstrate that it maintains and enhances the existing network of green infrastructure, the Nature Recovery Network, natural capital and biodiversity. Proposals that would result in the loss of existing green infrastructure or part of the Nature Recovery Network will be resisted unless it can be demonstrated that new opportunities will be provided that mitigates or compensates for this loss, and ensures that the ecosystem services of the area are retained.* *2. Proposals will be expected to retain and enhance existing fresh water features, hedgerows, trees and deciduous woodland and the provision of additional hedgerow and tree planting will be sought subject to appropriate consideration of local and wider context, habitats and species.* *3. Where the felling of a tree is necessary, for example due to disease, replacement planting with a suitable species and location to retain the link with the wider network of habitats and Green Infrastructure, will be required.*	The baseline environment is described in **Volume 2, Chapter 23, Section 23.5**, with the assessment described in **Sections 23.6** and **23.10**. Embedded environmental measures are described in **Section 23.8**. The design of the Proposed Development outlined in **Volume 2, Chapter 4** has avoided land take within any SSSIs or ancient woodland, and minimised overlap with notable ecological features wherever possible.

Policy description	Relevance to assessment
4. Development proposals will be expected to remove invasive species and will be required to contribute to the enhancement of existing biodiversity and deliver, as a minimum, a 10% net gain through the delivery of appropriate on-site biodiversity net gain or, where this is not practicable, to off-set the delivery to the Nature Recovery Network. *5. Proposals should create and manage appropriate new habitats, taking into account pollination, where practicable. The Council will support new development which retains and /or enhances significant features of nature conservation on development sites. The Council will also support development which makes a positive contribution to biodiversity, and where appropriate the Nature Recovery Network, through the creation of green spaces, and linkages between habitats to create local and regional ecological networks and allow the movement of wildlife through development sites.* *6. Particular consideration will be given to the hierarchy of sites and habitats in the District as follows:* *1.Special Protection Area (SPA) and Special Areas of Conservation (SAC)* *2. Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNRs)* *3. Local Wildlife Sites (LWS), Local Nature Reserves (LNRs) and any areas of Ancient Woodland, traditional orchards, local geodiversity or other irreplaceable habitats not already identified in a & b above.* *7. Where development is anticipated to have a direct or indirect adverse impact on sites or features of importance to nature conservation, development will be refused unless it can be demonstrated that:*	

Policy description	Relevance to assessment
1. The objectives of a site's designation, where applicable, and integrity of the area will not be undermined; *2. The reason for the development clearly outweighs the need to protect the value of the site; and,* *3. That appropriate mitigation and compensation measures are provided.* *8. Any development with the potential to impact Arun Valley SPA or the Mens SAC will be subject to a Habitats Regulation Assessment to determine the need for an Appropriate Assessment. In addition, development will be required to be in accordance with the necessary mitigation measures for development set out in the HRA of this plan."*	
Mid Sussex District Plan 2014 – 2031 (2018)	
DP37 Trees, woodland and hedgerows states: *"The District Council will support the protection and enhancement of trees, woodland and hedgerows, and encourage new planting. In particular, ancient woodland and aged or veteran trees will be protected. Development that will damage or lead to the loss of trees, woodland or hedgerows that contribute, either individually or as part of a group, to the visual amenity value or character of an area, and/ or that have landscape, historic or wildlife importance, will not normally be permitted. Proposals for new trees, woodland and hedgerows should be of suitable species, usually native, and where required for visual, noise or light screening purposes, trees, woodland and hedgerows should be of a size and species that will achieve this purpose. Trees, woodland and hedgerows will be protected and enhanced by ensuring development: • incorporates existing important trees, woodland and hedgerows into the design*	The design of the Proposed Development outlined in **Volume 2, Chapter 4** has avoided land take within any ancient woodland. Potential likely significant effects resulting on ancient woodland close to the construction site and operational infrastructure are assessed in **Volume 2, Chapter 23, Section 23.6** and **Section 23.10**. Embedded environmental measures are detailed in **Section 23.8.** Veteran trees have not yet been identified within the PEIR Assessment Boundary. Any veteran trees will be identified as part of an arboriculture survey in 2021. Embedded environmental measures in **Volume 2, Chapter 23, Section 23.8** provide methods for avoidance should they be needed.

Policy description	Relevance to assessment
of new development and its landscape scheme; and • prevents damage to root systems and takes account of expected future growth; and • where possible, incorporates retained trees, woodland and hedgerows within public open space rather than private space to safeguard their long-term management; and • has appropriate protection measures throughout the development process; and • takes opportunities to plant new trees, woodland and hedgerows within the new development to enhance on-site green infrastructure and increase resilience to the effects of climate change; and • does not sever ecological corridors created by these assets. Proposals for works to trees will be considered taking into account: the condition and health of the trees; and • the contribution of the trees to the character and visual amenity of the local area; and • the amenity and nature conservation value of the trees; and • the extent and impact of the works; and • any replanting proposals. The felling of protected trees will only be permitted if there is no appropriate alternative. Where a protected tree or group of trees is felled, a replacement tree or group of trees, on a minimum of a 1:1 basis and of an appropriate size and type, will normally be required. The replanting should take place as close to the felled tree or trees as possible having regard to the proximity of adjacent properties. Development should be positioned as far as possible from ancient woodland with a minimum buffer of 15 metres maintained between ancient woodland and the development boundary."	
DP38 Biodiversity states: *"Biodiversity will be protected and enhanced by ensuring development:* *• Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that*	The baseline environment is described in **Volume 2, Chapter 23, Section 23.5**, with the assessment described in **Sections 23.6** and **23.10**. Embedded environmental measures are described in **Section 23.8**.

Policy description	Relevance to assessment
there is a net gain in biodiversity, including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments; and *• Protects existing biodiversity, so that there is no net loss of biodiversity. Appropriate measures should be taken to avoid and reduce disturbance to sensitive habitats and species. Unavoidable damage to biodiversity must be offset through ecological enhancements and mitigation measures (or compensation measures in exceptional circumstances); and* *• Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience; and* *• Promotes the restoration, management and expansion of priority habitats in the District; and* *• Avoids damage to, protects and enhances the special characteristics of internationally designated Special Protection Areas, Special Areas of Conservation; nationally designated Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty; and locally designated Sites of Nature Conservation Importance, Local Nature Reserves and Ancient Woodland or to other areas identified as being of nature conservation or geological interest, including wildlife corridors, aged or veteran trees, Biodiversity Opportunity Areas, and Nature Improvement Areas. Designated sites will be given protection and appropriate weight according to their importance and the contribution they make to wider ecological networks. Valued soils will be protected and enhanced, including the best and most versatile agricultural land, and development should not contribute to unacceptable levels of soil pollution."*	The design of the Proposed Development outlined in **Volume 2, Chapter 4** has avoided land take within any SSSIs or ancient woodland, and minimised overlap with notable ecological features wherever possible.

2. References

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4.23.2

Rampion 2 WIND FARM

Volume 4, Appendix 23.2

Terrestrial ecology desk study

GoBe wood.

Contents

1. Introduction

1.1.1 The “Biodiversity and Geological Conservation” section of Overarching National Policy Statement for Energy (EN 1) outlines the expectations of the UK Government regarding the consideration of biodiversity. Paragraph 5.3.3 recommends that the applicant should ensure that details of “*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*” are provided to inform a proportionate assessment of the effects of Rampion 2.

1.1.2 The purpose of this report is to present the results of a desk study undertaken to identify statutory and non-statutory sites designated for their nature conservation importance, Habitats and Species of Principal Importance in England, and other legally protected, notable and controlled species relevant to Rampion 2.

1.1.3 The results of this desk study will be used to support the Environmental Impact Assessment (EIA) process and the Habitats Regulations Assessment (HRA) for Rampion 2.

2. Study area

2.1.1 This desk study is based on the onshore elements of the Preliminary Environmental Information Report (PEIR) Assessment Boundary as described in **Chapter 1: Introduction**, **Section 1.2** of the PEIR. This area provides a design envelope that allows for all foreseeable possible scenarios that may be covered within the evolving design. This means that the extent of the PEIR Assessment Boundary is considerably larger than the area within which construction or operation of infrastructure will take place; meaning that the coverage of the desk study is large and likely to remain suitable for informing all assessment of ecological features going forward.

2.1.2 The 'study area' for this desk study comprises:

- land within the PEIR Assessment Boundary, as shown on **Figure 23.1, Volume 3** of the PEIR;
- areas of search (measured from the PEIR Assessment Boundary) for sites designated for their nature conservation interest at the international/national site network, national and local levels;
- an area of search for legally protected and notable ecological features; and
- an area of search for any legally controlled species.

2.1.3 The extent of the areas of search (see **Table 3.1**) were determined based on best practice guidance and a high-level overview of the types of ecological features present, and the potential effects that could occur (see **Figure 23.1, Volume 3**).

3. Methodology

3.1.1 Data on internationally, nationally and locally designated sites for nature conservation, legally protected, notable and controlled species and habitats (see **Table 3-1** and **Table 3-2** for details) were obtained through data requests to a range of nature conservation organisations and interrogation of publicly available databases. These data sources are:

- A27 Arundel Bypass Environmental Assessment Report, Highways England (2019) (online reports interrogated November 2020);
- British Trust for Ornithology (BTO) – Wetland Bird Survey (WeBS) information (database interrogated May 2020);
- Mid Arun Valley Environmental Survey (MAVES) (online reports interrogated December 2020).
- Multi Agency Geographic Information for the Countryside (MAGIC) database (interrogated December 2020);
- National Biodiversity Network (NBN) Gateway (interrogated May 2020);
- Royal Society for the Protection of Birds (RSPB) (through data request);
- South Downs National Park Authority (SDNPA);
- Sussex Biodiversity Records Centre (SxBRC) (through data request); and
- Sussex Ornithological Society (SOS) (through data request).

Table 3-1 Key sources of terrestrial ecology and nature conservation sites

Ecological Feature	Example/Definition	Coverage of study area
Statutory sites designated under international conventions or the Habitats Regulations[1]	Special Areas of Conservation (SAC), candidate SAC (cSAC), Special Protection Areas (SPA), proposed SPA, Ramsar sites and proposed Ramsar sites.	SACs and possible[2] SACs were searched for inside and within 12km of the PEIR Assessment Boundary to reflect recommendations in the Draft Sussex Bat Special Area of Conservation: Planning and Landscape Enhancement Protocol (also known as the “Draft Sussex Bat SAC Protocol) (2018).

[1] Sites (for example, SPAs and SACs) that were formerly termed European sites are referred to within this chapter as constituents of the national site network reflecting the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
[2] Magic.gov.uk identifies possible SACs as a category, as opposed to candidate SACs. Possible SACs are sites that have been identified but have not been submitted to the European Commission for designation (cSACs are the same except they have been submitted are but are not yet designated). There are no candidate SACs currently for the UK – possible SACs were included to ensure completeness.

Ecological Feature	Example/Definition	Coverage of study area
		SPAs, proposed SPAs, Ramsar sites and proposed Ramsar sites were searched for inside and within 10km of the PEIR Assessment Boundary reflecting the upper foraging distances of dark-bellied brent geese *Branta bernicla bernicla* (Summers & Critchley, 1990) and Bewick's swan *Cygnus columbianus bewickii* (Robinson *et al*. 2004) from roost locations. These species were identified as the species with the largest foraging distances for terrestrial habitats for any SPA features within the wider area.
Statutory sites designated under national legislation	Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)).	SSSIs with bats listed on the citation were searched for inside and within 12km of the PEIR Assessment Boundary. NNRs and all other SSSIs were searched for inside and within 5km of the PEIR Assessment Boundary following precedent for other large infrastructure projects. LNRs were searched for within 1km reflecting the purpose of their designation.
Locally designated sites	In Sussex, these are termed as Local Wildlife Sites (LWS) and notable road verges (NRV).	LWS and NRV were searched for inside and within 5km of the PEIR Assessment Boundary.
Habitats of Principal Importance (HPI) and Species of Principal Importance (SPI)[3],	HPIs and SPIs, species recorded on The IUCN Red List of Threatened Species and/or local Red Lists[4] for the UK or relevant sub-units (for	HPI and SPI, Red listed species and Legally protected species were searched for inside and within 5km of the PEIR Assessment Boundary unless otherwise specified.

[3] Habitats and Species of Principle Importance covered under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

[4] The IUCN red list provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose

Ecological Feature	Example/Definition	Coverage of study area
Red listed species and legally protected species.	example, regions or counties) and legally protected habitats and species include those listed on Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended), those included on Schedules 2 and 5 of the Habitats Regulations. Badger and Hedgerows are provided protection under the Protection of Badgers Act 1992 and the Hedgerows Regulations 1997 respectively.	Ornithological data provided by SOS is supplied by tetrad (a square containing four Ordnance Survey 1km grid squares). Data for all tetrads that are within or overlap with the Scoping Boundary[5] have been obtained. Data on stone curlew *Burhinus oedicnemus* and lapwing *Vanellus vanellus* nesting locations and habitat creation measures (for example, stone curlew plots) supplied by the RSPB within the Scoping Boundary[5] and within 500m of it. Summary Wetland Bird Survey (WeBS) data available from the British Trust for Ornithology (BTO) was obtained for all count sectors within the Scoping Boundary[5] or within 1km of it at the closest point.
Legally controlled species	Legally controlled species include those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).	Legally controlled species searched for inside the PEIR Assessment Boundary and within 5km of it.
Bat roosting locations	Bat roost locations are considered separately from other species records in accordance with guidance.	Bat roosting locations were searched for inside and within 5km of the PEIR Assessment Boundary.
Water body locations	Water bodies may support species within the groups listed above (for example legally protected great crested newts).	Water body locations were searched for inside the PEIR Assessment Boundary and within 250m of it, also within 500m of proposed onshore substation locations.

of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction - those listed as Critically Endangered, Endangered and Vulnerable (IUCN, 2021).

[5] A wider area for bird records was searched to inform the Scoping Report. Given the structure of the data, it has not been tailored to the current PEIR Assessment Boundary however it is considered to be representative given the mobile nature of birds.

Table 3-2 Sources of desk study data

Source	Summary of information provided
A27 Bypass Environmental Assessment Report (Highways England, 2019)	Data on legally protected and notable flora and fauna inside the PEIR Assessment Boundary and within 5km of it.
BTO Wetland Bird Survey Reports	Core count data (yearly peaks) for WeBS count sites within the PEIR Assessment Boundary and within 1km of it.
Magic.gov.uk	Data on the location of statutorily designated sites, data from the Ancient Woodland and Priority Habitat Inventories, granted European Protected Species Licence locations (2010 to 2020) and great crested newt eDNA survey outcomes from 2017-2019 effort by Natural England for district licensing purposes.
MAVES	Report data on legally protected and notable flora and fauna within the PEIR Assessment Boundary and within 5km of it.
NBN Gateway	Information on legally protected and notable flora and fauna was interrogated within the PEIR Assessment Boundary and within 500m of it.
RSPB	Data on stone curlew and lapwing breeding within the Scoping Boundary[5] and within 500m of it and location of habitat creation (for example, stone curlew plots) within this area.
SDNPA	Data on legally protected and notable fauna in the South Downs National Park, and information on the Sussex Study Area monitoring project on impacts of farming on flora and fauna of arable land inside the PEIR Assessment Boundary and within 5km of it.
SxBRC	Data on sites designated for nature conservation, priority habitats and legally protected and notable flora and fauna.
SOS	Data on species listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) and notable bird species within tetrads that overlap with the Scoping Boundary[5]. Additional information requested on lapwing nesting habitat and Bewick's swan foraging habitat locations.

4. Results

4.1 Statutory designated sites of nature conservation

4.1.1 Statutory designated sites of nature conservation were identified from datasets available from Magic.gov.uk (a service managed by Natural England).

4.1.2 A total of six international/national site network sites are present within the areas of search identified in **Table 4-1**. There are a number of overlapping designations (i.e. the same geographic area is both a Ramsar site and n SPA) meaning that these six sites equate to five distinct geographical locations. None of these sites are within the PEIR Assessment Boundary.

4.1.3 In addition, there are 14 SSSIs and one LNR identified within the relevant areas of search identified in **Table 4-1.** Amberley Mount to Sullington Hill SSSI and West Beach LNR are within the PEIR Assessment Boundary.

4.1.4 **Figure 23.5, Volume 3** illustrates the locations of international/national site network sites, whilst **Figure 23.6, Volume 3** shows the locations of sites designated via national legislation.

Table 4-1 Details of statutory designated sites of nature conservation

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
International/national site network sites		
Arun Valley Ramsar site **(overlaps with Arun Valley SAC, Arun Valley SPA, Amberley Wild Brooks SSSI, Waltham Brooks SSSI and Pulborough Brooks SSSI)**	1) Qualifies under Ramsar criterion 2 for seven wetland invertebrate species listed on the British Red Data Book, four nationally rare and four nationally scarce plant species. 2) Qualifies under Ramsar criterion 3 for a diverse and rich ditch flora. 3) Qualifies under Ramsar criterion 5 for its assemblage of wintering waterfowl.	3.8km north-west
Arun Valley SAC **(overlaps with Arun Valley Ramsar site, Arun Valley SPA, Amberley Wild Brooks SSSI, Waltham Brooks**	1) Ramshorn snail *Anisus vorticulus*	3.8km north-west

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
SSSI and Pulborough Brooks SSSI)		
Arun Valley SPA **(overlaps with Arun Valley SAC, Arun Valley Ramsar site, Amberley Wild Brooks SSSI, Waltham Brooks SSSI and Pulborough Brooks SSSI)**	1) Bewick's swan (non-breeding) 2) Waterfowl assemblage (non-breeding): including shoveler *Anas clypeata*, teal *Anas crecca*, wigeon *Anas penelope* and Bewick's swan	3.8km north-west
Duncton to Bignor Escarpment SAC	1) Asperulo-Fagetum beech forests	7.2km north-west
Solent and Dorset Coast SPA	1) Sandwich tern *Sterna sandvicensis* (breeding) 2) Common tern 3) Little tern	2.3km south-west
The Mens SAC	1) Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) 2) Barbastelle *Barbastella barbastellus*	11.2km north-west
National sites		
Amberley Mount to Sullington Hill SSSI[6]	3) CG2 – *Festuca ovina – Avenula pratensis* lowland calcareous grassland 4) CG3 – *Bromus erectus* lowland calcareous grassland 5) Juniper *Juniperus communis* 6) Fly honeysuckle *Lonicera xylosteum* 7) Adonis blue butterfly *Polyommatus bellargus*	Within PEIR Assessment Boundary

[6] Amberley Mount to Sullington Hill SSSI and Arundel Park SSSI are also identified as groundwater dependent terrestrial ecosystems in **Chapter 27: Water environment**. This aspect of the SSSI will be considered alongside the designated features in all future assessment.

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
Amberley Wild Brooks SSSI	1) Redshank *Tringa tetanus* (breeding) 2) Bewick's swan (non-breeding) 3) Shoveler (non-breeding) 4) Teal (non-breeding) 5) Breeding bird assemblage – mixed lowland damp grassland, woodland 6) Invertebrate assemblage 7) Lowland ditch system 8) Outstanding dragonfly assemblage 9) True fox-sedge *Carex vulpine* 10) Cut-grass *Leersia oryzoides* 11) S3 – *Carex paniculate* swamp 12) S5 – *Glyceria maxima* swamp 13) S7 *Carex acutiformis* swamp 14) Variety of wintering bird species 15) Vascular plant assemblage	3.8km north-west
Arun Banks SSSI	1) *Schoenoplectus lacustris* sub-species *tabernaemontani x triqueter* 2) W5 – *Alnus glutinosa – Carex paniculate* woodland 3) W6 – *Alnus glutinosa – Urtica dioica* woodland	1.8km north-west
Arundel Park SSSI	4) Breeding bird assemblage – mixed: scrub, woodland 5) CG2 *Festuca ovina – Avenula pratensis* lowland calcareous grassland 6) CG3 – *Bromus erectus* lowland calcareous grassland 7) Invertebrate assemblage 8) Field cricket *Gryllus campestris* 9) Cut-grass	1.0km north-west
Chanctonbury Hill SSSI	1) Breeding bird assemblage – mixed: lowland damp grassland, woodland 2) CG2 – *Festuca ovina – Avenula pratensis* lowland calcareous grassland 3) CG3 – *Bromus erectus* lowland calcareous grassland 4) Great crested newt	0.6km south-east

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
	5) W12 – *Fagus sylvatica – Mercurialis perennis* woodland	
Chantry Mill SSSI	1) EA – Aptian - Albian	0.7km north-west
Cissbury Ring SSSI	1) Breeding bird assemblage – mixed: scrub, woodland 2) CG1 – *Festuca ovina – Carlina vulgaris* lowland calcareous grassland 3) CG2 – *Festuca ovina – Avenula pratensis* lowland calcareous grassland 4) CG3 – *Bromus erectus* lowland calcareous grassland 5) CG4 – *Brachypodium pinnatum* lowland calcareous grassland 6) Adonis blue butterfly	4.5km south
Climping Beach SSSI **(overlaps with West Beach LNR)**	7) Sanderling *Calidris alba* 8) SD1 – *Rumex crispus – Glaucium flavum* shingle community 9) SD7 – *Ammophila Arenaria – Festuca rubra* semi-fixed dune community 10) SD8 – *Festuca rubra – Galium verum* fixed dune grassland	0.1km east
Fairmile Bottom SSSI	1) Silver-washed fritillary *Argynnis paphia*, calcareous grassland, woodland.	4.3km north-west
Horton Clay Pit SSSI	1) ED – Aptian - Albian	4.4km south-east
Hurston Warren SSSI	1) H2 – *Calluna vulgaris – Ulex minor* heath 2) M1 – *Sphagnum auriculatum* bog pool community 3) M16 – *Erica tetralix – Sphagnum compactum* wet heath	3.9km north-west
Parham Park SSSI	1) Combinations of species – lichens 2) Invertebrate assemblage 3) W10 – *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland	2.6km north-west

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
	4) W14 – *Fagus sylvatica – Rubus fruticosus* woodland 5) W15 – *Fagus sylvatica – Deschampsia flexuosa* woodland	
Pulborough Brooks SSSI	1) Pintail *Anas actua* (non-breeding) 2) Ruff (non-breeding) 3) Shoveler (non-breeding) 4) Teal (non-breeding) 5) Wigeon (non-breeding) 6) Breeding bird assemblage – lowland damp grasslands 7) Invertebrate assemblage 8) Vascular plant assemblage	5.0km north-west
Sullington Warren SSSI	1) Breeding bird assemblage – mixed; scrub, woodland 2) H2 – *Calluna vulgaris – Ulex minor* heath	0.7km north-west
West Beach LNR **(overlaps with Climping Beach SSSI)**	1) Sand flats, tide line, shingle, sand dunes and related fauna (part of Climping Beach SSSI)	0.7km east

4.2 Non-statutory designated sites of nature conservation

4.2.1 Non-statutory designated sites of nature conservation were identified within data provided by SxBRC.

4.2.2 **Table 4-2** provides the details of the LWS that are within the PEIR Assessment Boundary and within 5km of it. There are a total of four located fully or partially within the PEIR Assessment Boundary, with a further 38 within 5km of it (see **Figure 23.7, Volume 3**).

Table 4-2 Details of non-statutory designated sites of nature conservation within 5km of the PEIR Assessment Boundary

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
Arun Valley, Watersfield to Arundel LWS	1) This section of the River Arun and its floodplain forms an extensive tract of wetland, a nationally declining habitat. 2) Although many of the flood meadows have been improved, the wet grassland is important for breeding and wintering waders and wildfowl. There is a good network of ditches, some of which are very important botanically. 3) The site is important for birds, dragonflies, water beetles, snails and plants, and supports many rare and declining species. The unimproved meadows of Watersfield Brooks are of great botanical interest.	Adjacent to PEIR Assessment Boundary
Amberley Chalkpits & Hacketts Copse LWS	1) Amberley Chalkpits and the adjoining woodland contain a huge variety of habitats spanning the succession from bare chalk and spoil heaps to deciduous woodland. The varied aspects of the chalk pits add to the range of microhabitats present. 2) The site has an extremely rich flora and fauna including typical chalk downland species and many rarities. The site is also of geological importance.	3.2km north-west
America & Gratwicke's Wood LWS	1) An oak, ash, hazel woodland lying on the Weald Clay with wet areas supporting alder and aspen. The managed coppice provides a varied structure and together with paths and rides provides good habitats for birds and insects. The ground flora is rich and the trees and shrubs include wild service and Midland hawthorn.	1.9km north
Bines Green LWS	1) Bines Green is an area of common land that straddles the B2135 road. It is damp, unimproved, neutral grassland of	Within PEIR Assessment Boundary

[7] Description is copied from the summary provided on the designation information provided for each site by SxBRC.

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	considerable botanical interest with a small, overgrown pond to the west of the road.	
Binsted Wood Complex LWS	1) Binsted Wood is a complex of woodland sites which includes Hundredhouse Copse in the west and Stewards Copse to the east. There is a mixture of ancient woodland, recent woodland, conifer plantation, species rich pasture and old tracks and shaws. 2) The mix of habitats and geology gives rise to a very rich and diverse flora. The paths and rides are especially species rich and Scotland Lane supports an outstanding wet ride flora that includes at least 11 species of sedge including Long-stalked Yellow-sedge *Carex viridula* ssp.*brachyrhyncha*, a county rarity at its only recorded West Sussex location. This is the largest block of ancient semi-natural woodland south of the South Downs in Sussex.	1.8km north-west
Boyds Wood & Furzefield Copse LWS	1) Boyds Wood and Furzefield Copse are two botanically rich woodlands just outside the village of Nuthurst. They encompass a range of woodland types, both ancient semi-natural and more recent broadleaved plantation. 2) Boyds Wood includes a particularly interesting stream valley or gill woodland.	4.0km north-west
Broadmare Common LWS	1) The site is a registered common, located just south of Henfield. It is predominantly poor fen and scrub, with several ponds and an area of woodland. It represents a rather scarce habitat which, although somewhat degraded, is now managed for wildlife. 2) The location of the site amongst intensively farmed countryside and close to a small town increases its value for nature conservation.	2.8km south-east
Capite Wood LWS	1) This is a large area of very diverse woodland comprising both broadleaved ancient semi-natural woodland and re-planted areas of coniferous and deciduous trees.	2.0km north

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	2) The woodland has two small streams, species rich rides, wet flushes, banks, ditches and a varied topography. 3) It has suffered extensive storm damage and there is abundant deadwood. The woodland is rich in bryophytes.	
Clapham Wood LWS	1) Clapham Wood is an extensive, ancient semi-natural woodland on the undulating dip slope of the South Downs. 2) The ground flora is rich and includes a number of interesting species. The wood was moderately affected by the storm of October 1987 and unfortunately several large blocks of woodland were subsequently cleared for pasture. Much of the wood is not managed but some areas are still coppiced. 3) Clapham Woods is an ancient woodland of County-wide importance.	3.7km south-east
Conyers Bank LWS	1) Conyers Bank is a small, isolated field of unimproved chalk grassland on a steep, north-facing hillside. 2) Situated above the floodplain of the River Arun, it is surrounded by semi-natural woodland and improved water meadows. The site has a rich flora.	0.06km north-west
Coombe Wood LWS	1) Coombe Wood is an ancient semi-natural woodland situated in an east-facing coombe on the escarpment of the South Downs. 2) It has a rich mollusc fauna which includes the nationally rare snail *Helicodonta obvoluta*. The presence of an old Large-leaved Lime *Tilia platyphyllos* coppice stool is also of great interest.	4.8km north-west
Elmer Rocks LWS	1) Elmer beach is a fine example of vegetated shingle, an internationally rare habitat. 2) The intertidal area supports a diverse community including intertidal sand and eight 'rock islands' constructed in the early 1990s in the mid-tide zone to form a coastal defence against the eroding coastline.	1.2km west

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	3) The rock islands have provided a habitat type that is very rare, if not unique, in West Sussex. The rock pools are probably the best in the county.	
Heath Common LWS	1) This site has moderately rich remnants of wet and dry heath, several ponds and some relics of ancient base-rich woodland rich in lichens and ferns. In recent years, the Sandgate Conservation Society has done excellent work in the management of this area as a nature reserve.	0.5km north
Henfield Common LWS	1) The site is a registered common; one of three commons around Henfield. It is of great importance for wildlife as it encompasses a mosaic of species-rich grassland, woodland and a reedbed, together with small areas of marshy grassland and heath. 2) The site is being actively managed to enhance its value for wildlife.	2.6km south-east
Hoe Wood LWS	1) This ancient woodland is dominated by Oak, with frequent ash and birch over hazel coppice. 2) It has a good assemblage of woodland plants and supports a diverse community of birds. The site includes a lake which boasts significant numbers of dragonfly and damselfly species as well as providing for good populations of amphibians. 3) Also include is an unimproved meadow.	3.8km south-east
Hooklands Farm Meadow LWS	1) Hooklands Farm meadow is an excellent example of unimproved, damp grassland. 2) It is very species-rich and supports plants typical of damp and slightly acidic soils. 3) The site is surrounded by mature hedgerows and a stream runs through the meadow, creating a damp flush around an old pond in the south of the area.	3.7km north-west
Kithurst Hill LWS	1) This site lies on the steep, north-facing escarpment of the South Downs. 2) Most of it is wooded.	0.6km north-west

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	3) The lower slopes consist of ancient semi-natural woodland, mostly of ash and hazel. It is of interest for its epiphytic bryophytes. 4) There are small areas of open grassland with species-rich swards.	
Kneppmill Pond, the River Adur & Lancing Brook LWS	1) The site is a registered common, located close to Henfield. It consists of herb-rich damp grassland with areas of tall herbs and some scrub and woodland. 2) It has a small pond in the western corner.	3.4km north-west
Littlehampton Golf Course & Atherington Beach LWS	1) Littlehampton Golf Course is of outstanding importance botanically. 2) Although much of its grassland has been improved there are patches of species-rich turf. 3) The southern edge of the golf links includes an area of dry dune grassland, adjacent to the sand dune system of Climping Beach SSSI. 4) The site also includes an area of vegetated shingle beach, a nationally uncommon habitat.	Within PEIR Assessment Boundary
Long Furlong and Church Hill LWS	1) Long Furlong is a steep north and west-facing slope between the A280 and Clapham Woods, supporting rich chalk grassland and scrub. 2) Church Hill is a complex mosaic of chalk grassland, species-rich scrub and woodland. Long Furlong and Church Hill form a large piece of contiguous habitat, so have been included as one site.	3.0km south-east
Middleton Shingle LWS	1) The site consists of a strip of vegetated shingle along the seafront at Middleton-on-Sea with a large population of Sea Radish *Raphanus raphanistrum ssp. Maritimus*, a plant that occurs in only three other sites in Sussex. The strip of vegetated shingle is backed by regularly mown grass and then housing.	3.4km west

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
Monkmead Woods LWS	1) This is an area of wet heath, dry heath and woodland on the south west edge of West Chiltington Common, between Storrington and Pulborough. 2) The site has scarce plants, a rare fungus and nearby sites have a very rare dragonfly that could colonise this site if management was appropriate.	3.8km north-west
Old Deer Park LWS	1) This site which lies in an old deer park, south of Leonardslee Gardens, is one of the best surviving relics of the formerly vast St. Leonard's Forest. 2) In addition to moderately species-rich dry and wet heath, there is a very interesting bog. 3) The ancient parkland trees have a fine assemblage of woodland epiphytic lichens. 4) Today the park is grazed by a herd of wallabies.	2.8km north
Oreham Common LWS	1) The site is a registered common, located close to Henfield. It consists of herb-rich damp grassland with areas of tall herbs and some scrub and woodland. It has a small pond in the western corner.	4.0km south-east
Peppering Down LWS	1) A species-rich strip of chalk grassland on a west-facing slope. 2) There is a fair amount of scrub at the top of the slope in the south-east corner of the site.	1.6km north-west
Peppering Farm Dew Pond LWS	1) Peppering Farm dewpond is a small dried-up dewpond, situated adjacent to a main track on the Downs and surrounded by arable. 2) The area supports an exceptionally rich downland flora, including many uncommon plants. 3) It is maintained by a small band of volunteers with permission from the estate and farmer. The major task is the removal of scrub, mainly Gorse and Hawthorn.	1.3km north-west
Poling Copse LWS	1) Poling Copse is a large block of ancient, semi-natural woodland on the Coastal Plain	0.02km east

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	south of the South Downs, just to the east of Arundel. 2) It consists predominantly of Oak-Hazel woodland, a type typical of base-poor soils in the area. Sycamore woodland dominates on South Fields – a section which has probably regenerated on an old field.	
Pond Lye LWS	1) This site includes a pond with extensive areas of sedge swamp around the margins and a species-rich neutral grassland. 2) A number of locally uncommon plants are found in the meadow. The pond is of great ornithological importance, particularly for its breeding birds.	4.0km east
Rewell Wood Complex LWS	1) Rewell Wood is a large ancient woodland complex. It has a diversity of habitats including ancient semi-natural woodland, worked Sweet Chestnut coppice, conifer plantation, Beech plantation and species-rich chalk grassland. 2) Wide rides and glades support a rich flora and butterfly fauna. The disused gravel pits are of entomological importance.	1.4km north-west
River Adur Water Meadows & Wyckham Wood LWS	1) Wyckham Wood, one of the few woodlands on the floodplain of the River Adur is of particular importance on account of its heronry. 2) The water meadows have mostly been improved but some of the ditches are of great botanical interest. This wetland area is also of importance to birds and dragonflies.	1.4km south-east
Steyning Coombe & Steyning Round Hill LWS	1) Steyning Coombe and Steyning Round Hill are both important areas of unimproved downland on the escarpment above Steyning. 2) Together these areas are extremely diverse, having steep slopes facing all directions, both short herb-rich sward and tall ungrazed sward, open grassland and grassland with scattered scrub.	2.5km south-east

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	3) The rich flora and invertebrate fauna includes several rare plants, snails and butterflies.	
Sullington Hill LWS	1) This stretch of the South Downs escarpment supports moderately species-rich chalk grassland on north and east-facing slopes. 2) Some areas are maintained by grazing while others are no longer grazed and have become heavily scrub-invaded. The site includes small areas of semi-natural woodland.	Within PEIR Assessment Boundary
The Downs Link, Nutham Wood & Greatsteeds Farm Meadow LWS	1) The Downs Link, a dismantled railway line, has developed into an interesting moderately species-rich belt of shrubs. 2) This supports a large colony of the rare Brown Hairstreak butterfly. 3) A number of important wildlife sites lie adjacent to the old railway, notably a small, herb-rich meadow and small, stream-side, ancient semi-natural woodlands. 4) Nutham Wood, in particular, has a very rich ground flora.	3.7km north-west
The Hanger LWS	1) Two main types of wood are present within this gill woodland site. 2) Alder occurs along the streams and extends up the lower slopes in parts, with oak, hazel and ash on the upper slopes and the flat ground above. 3) The wood supports a wide range of woodland plants, mosses and liverworts, a good bird community and a number of uncommon butterflies.	3.6km east
The Sanctuary, High Salvington LWS	1) The site consists of a south-facing coombe and slope, located on the edge of High Salvington. 2) The north and west part of the site is a mosaic of species-rich scrub, secondary woodland and chalk grassland, which is managed bird sanctuary. 3) The rest is open, herb-rich grassland. The site represents a scarce habitat in the Borough. Meadow Clary Salvia pratensis, a	4.8km south-east

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
	Red Data Book species, occur here in one of only two sites in West Sussex.	
Tottington Wood LWS	1) This wood is situated just north of the South Downs. It consists typically of scattered Oak and Ash standards over mainly Hazel and some Ash coppice. 2) It supports a very species-rich ground flora and a good number of bryophytes have been recorded. There are species-rich rides and several small streams.	4.5km south-east
Walden Close Meadow LWS	1) This site consists of a large meadow alongside the A272 and a small meadow to the north. Both fields are cut for hay and have species-rich swards. 2) The smaller meadow is notably rich in invertebrates.	2.4km north-west
Warningcamp Hill and New Down LWS	1) The steep, north-west facing slope of New Down supports herb-rich chalk grassland with extensive patches of Burnet Rose *Rosa pimpinellifolia*, an uncommon plant in West Sussex. Warningcamp Hill supports a very large population of the rare Small-flowered Buttercup *Ranunculus parviflorus*. 2) The site also includes an old chalk pit and a small area of ancient, semi-natural woodland.	Within PEIR Assessment Boundary
Washington Chalk Quarry LWS	1) This area of open downland and scattered scrub lies at the western end of Chanctonbury Hill. It includes a collection of disused chalk pits which now support species-rich grassland. 2) The flora and butterflies are both of great interest. 3) Part of the site has recently been fenced and sheep grazing reinstated. 4) The South Downs Way runs through the site.	0.7km south
West Wantley Farm Meadow	1) Unimproved damp pasture meadow bounded by species rich hedgerow and ponds with notable populations of rare thistle.	2.4km north-west

Site name	Description[7]	Distance and direction from the PEIR Assessment Boundary
West Wantley Farm Meadow LWS	1) This is a small, unimproved pasture just north of Storrington. This unimproved pasture is an excellent example of damp, unimproved grassland of a type that is both locally and nationally threatened. It is surrounded by a species-rich hedgerow and has damp flushes in the south west corner and a pond in the eastern part of the southern boundary. 2) The site has a very large population of Meadow Thistle *Cirsium dissectum* which is very scarce in West Sussex.	2.4 north-west
Wiston Ponds LWS	1) This is a well-established pond within the grounds of Wiston Park. It is surrounded by trees and scrub and has well-developed marginal vegetation. 2) Good populations of amphibians use this pond and also it supports a number of interesting bird species.	1.3km south-east

4.2.3 SxBRC also returned 37 records of notable road verges within 5km of the PEIR Assessment Boundary. **Figure 23.7, Volume 3** of the PEIR shows the location of the notable road verges identified.

4.3 Habitats

Habitats of Principal Importance and Ancient Woodland

4.3.1 Habitats listed on the Ancient Woodland Inventory and the Priority Habitats Inventory (MAGIC website, Natural England) were identified during the desk study.

4.3.2 Habitats within the PEIR Assessment Boundary and within 500m of it identified from the Priority Habitats and Ancient Woodland Inventories are provided in **Table 4-3**, and their distribution shown on **Figures 23.8** and **23.9, Volume 3**.

Table 4-3 Priority Habitat and Ancient Woodland Inventory information

Habitat type	Listing	Area within PEIR Assessment Boundary (ha)	Area within PEIR Assessment Boundary plus 500m (ha)
Coastal and floodplain grazing marsh	Priority habitat inventory	83.20	393.04
Coastal vegetated shingle	Priority habitat inventory	0.49	4.31
Deciduous woodland	Priority habitat inventory	61.19	571.811
Lowland calcareous grassland	Priority habitat inventory	14.87	79.701
No main habitat but additional habitats present	Priority habitat inventory	0.70	42.01
Ancient semi-natural woodland	Ancient woodland inventory	0.19	120.11
Ancient replanted woodland	Ancient woodland inventory	0.00	49.54

Waterbodies

4.3.3 A total of 34 water bodies have been identified within the PEIR Assessment Boundary, with a further 348 within 250m of it, and within 500m of proposed substation search areas. Waterbodies become more common in areas north and east of Washington; shape and size vary, although there are no particularly large water bodies (for example, large drinking water reservoirs) with the vast majority being less than a hectare in extent. **Figures 23.11a** and **23.11b, Volume 3** show the distribution of the waterbodies.

Vascular plants

4.3.4 A total of 1,279 records of vascular plants of 175 species that are legally protected or notable (some at a county level only) were identified within 5km of the PEIR Assessment Boundary. Of these, nine records of six species were from within the PEIR Assessment Boundary, comprising:

- one record of bastard-toadflax *Thesium humifusum* (Nationally Scarce (Joint Nature Conservation Committee, 2018), Sussex rare);
- three records of bluebell *Hyacynthoides non-scripta* (Schedule 8 of the Wildlife & Countryside Act 1981 (as amended));

- two records of broad-leaved spurge *Euphorbia platyphyllos* (Sussex Rare);
- one record of prickly poppy *Papaver argemone* (Red List GB (2005): Vulnerable, Red List England (2014): Endangered);
- one record of stiff saltmarsh-grass *Puccinellia rupestris* (Nationally Scarce, Sussex Rare); and
- one record of strawberry clover *Trifolium fragiferum* (Red List England (2014): Vulnerable).

4.3.5 Records of vascular plants within 5km of the PEIR Assessment Boundary include[8]:

- four species listed on Schedule 8 of the Wildlife & Countryside Act 1981 (as amended). These were bluebell, cut-grass *Leersia oryzoides*, holly-leaved naiad *Najas marina* and spiked rampion *Phyteuma spicatum;*
- 23 species listed as SPI; common juniper *Juniperus communis subsp. Communis*, corn buttercup *Ranunculus arvensis,* cornflower *Centaurea cyanus*, divided sedge *Carex* divisia, field fleawort *Tephroseris integrifolia subsp. Integrifolia*, fine-leaved Sandwort *Minuartia hybrida*, fly orchid *Ophrys insectifera*, frog orchid *Dactylorhiza viridis*, Grape-hyacinth *Muscari neglectum*, Greater Water-parsnip *Sium latifolium*, juniper *Juniperus communis*, lesser Butterfly-orchid *Platanthera bifolia*, marsh stitchwort *Stellaria palustris*, musk orchid *Herminium monorchris*, perennial centuary *Centaurium scilloides*, purple milk-vetch *Astragalus danicus*, sharp-leaved pondweed *Potamogeton acutifolius*, shepherd's-needle *Scandix pecten-veneris*, small-flowered sticky eyebright *Euphrasia officinalis subsp. Anglica*, true Fox-sedge *Carex vulpine,* tubular water-dropwort *Oenanthe fistulosa*, white helleborine *Cephalanthera damasonium* and wild candytuft *Iberis amara*;
- 61 threatened species (Critically Endangered, Endangered and Vulnerable) in England and/or Great Britain (Stroh et al., 2014; Cheffings et al., 2005);
- seven nationally rare**Error! Bookmark not defined.** species;
- 36 nationally scarce species; and
- 44 Sussex rare species.

MAVES Ecological Survey Reports 2017 and 2018

4.3.6 Thirteen notable vascular plants species (including two Red List England (2014): Vulnerable), and three notable fungal species (one SPI and two Sussex rare) were recorded during the surveys. In addition, six noteworthy local and/or uncommon vascular plants were recorded in the area. Specific locations are not provided.

[8] Vascular plants are grouped according to the highest level of legislative or conservation status afforded to each species, however, may be listed under multiple criteria (for example, Cornflower is listed as an SPI and as a Sussex rare species).

4.4 Fauna (excluding birds)

Mammals, reptiles and amphibians

4.4.1 Records of legally protected and notable species were provided directly by SxBRC. Further information was gathered from the NBN Gateway, A27 Arundel Bypass Environmental Assessment Report, MAVES and Magic.gov.uk.

4.4.2 Summary details of mammals, amphibians and reptiles within the PEIR Assessment Boundary and within 5km of it are provided in **Table 4-4**. The summary details are of records provided by SxBRC, these have been reconciled where possible with other data sources where a high degree of overlap can be recognised.

Table 4-4 Summary of legally protected and notable species (mammals, reptiles and amphibians)

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Adder *Vipera berus*	58	2010-2019	0.8km north
Alcathoe bat *Myotis alcathoe*	24 (no records of roosts)	2014-2018	0.3km south
Badger *Meles meles*	Present – individual records not provided due to confidentiality		
Bat (unspecified species)	45 (17 roosts recorded: one "*feeding roost*", 13 "*unspecified roost*", one confirmed maternity roost, and two *"hibernacula roost/unspecified roosts")*	2010-2018	0.07km west
Barbastelle *Barbastella barbastellus*	39 (three roost records: two "*unspecified*" and one "*hibernacula/unspecified*")	2010-2019	0.03km west
Bechstein's bat *Myotis bechsteinii*	18 (one *"unspecified roost"*)	2012-2018	0.07km north-west
Brandt's bat *Myotis brandtii*	12 (no records of roosts)	2011-2019	2.8km north-west
Brown hare *Lepus europaeus*	66	2010-2019	Within PEIR Assessment Boundary

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Brown long-eared bat *Plecotus auritus*	113 (38 records of roosts: two "*feeding roosts*", one "*hibernacula roost*", two "*maternity roosts*", 33 "*unspecified roosts*". Four records of "*droppings*").	2010-2019	0.03km east
Common lizard *Zootoca vivipara*	204	2010-2019	Within PEIR Assessment Boundary
Common pipistrelle *Pipistrellus pipistrellus*	271 (75 roosts: one "*feeding roost*", one "*hibernacula roost*", four "*maternity roosts*", 69 "*unspecified roosts*"; with two additional records noting "*droppings*").	2010-2019	Adjacent to the PEIR Assessment Boundary
Common toad *Bufo bufo*	144	2010-2019	Within PEIR Assessment Boundary
Daubenton's bat *Myotis daubentonii*	70 (eight records of roosts: five *"hibernacula roost/unspecified roost*" and three "*hibernacula roosts*").	2010-2019	0.03km west
***Eptesicus* Bat species**	7 (no records of roosts)	2018	Adjacent to the PEIR Assessment Boundary
Grass snake *Natrix helvetica*	164	2010-2019	Adjacent to the PEIR Assessment Boundary
Great crested newt *Triturus cristatus*	188	2010-2019	Within PEIR Assessment Boundary
Greater horseshoe bat	1 (no records of roosts)	2019	3.9km north-west

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Rhinolophus ferrumequinum			
Harvest mouse *Micromys minutus*	13	2010-2019	0.1km east
Hazel dormouse *Muscardinus avellanarius*	265	2010-2020	1.0km north-west
Hedgehog *Erinaceus europaeus*	363	2010-2020	Adjacent to the PEIR Assessment Boundary
Leisler's bat *Nyctalus leisleri*	8 (no records of roosts)	2018-2019	0.5km south
Myotis bat (unspecified species)	35 (three *"unspecified"* roost records, and one *"droppings"* record)	2011-2019	0.3km south-east
Nathusius' pipistrelle *Pipistrellus nathusii*	16 (no records of roosts)	2014-2019	0.1km south
Natterer's bat *Myotis natereri*	73 (26 records of roosts: nine "*hibernacula roost*", 13 "*hibernacula / unspecified roosts*", one "*maternity roost*", three "*unspecified roosts*", and one "*droppings*" record)	2010-2019	0.3km south
Noctule *Nyctalus noctula*	61 (three records of "*unspecified*" roosts)	2010-2019	0.06km east
***Nyctalus* species**	7 (no records of roosts)		
Otter *Lutra lutra*	1 (from the NBN Gateway)	2011	1.95km west
Pipistrelle bats (species unspecified)	43 (19 roost records, including one "*feeding roost*", one "*maternity*	2010-2019	0.05km east

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
	roost/feeding roost", 17 "*unspecified roosts*, and two records of "*droppings*")		
***Plecotus* species**[9]	60 (31 records of roosts, two *"maternity roosts", four* "*maternity roosts/feeding roosts*", and 25 "*unspecified roosts*". Six records of "droppings".)		
Polecat *Mustela putorius*	19	2012-2020	Adjacent to the PEIR Assessment Boundary
Sand lizard *Lacerta agilis*	2	2014	1.1km east
Serotine *Eptesicus serotinus*	91 (26 records of roosts, one "*feeding roost*", three "*maternity roosts*", one "*maternity roost/feeding roost*", 21 "*unspecified roost*", and one record of "*droppings*")	2010-2019	0.09km south-east
Slow worm *Anguis fraglis*	240	2010-2019	Within PEIR Assessment Boundary
Soprano pipistrelle *Pipistrellus pygmaeus*	186 (42 roost records, including four "*maternity roost*", one "*maternity roost; mating/swarming site; droppings*", and 37 "*unspecified roosts*")	2010-2019	0.03km west

[9] Grey long-eared bats may constitute some of the records (41 in total) for undetermined long-eared species. However, as this bat is relatively rare and restricted to a small number of colonies, whereas brown long-eared bat is well distributed and relatively common, these records are more likely to be attributable to the latter.

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Water vole *Arvicola amphibius*	774	2010-2019	Within PEIR Assessment Boundary
Whiskered bat *Myotis mystacinus*	25 (two records of roosts: one "*unspecified*" and one "*maternity*")	2011-2019	0.6km west
Whiskered bat / Brandt's bat *Myotis brandtii*	22 (nine roosts: four "*hibernacula roost / unspecified roost*" three "*unspecified roost*", one "*hibernacula*", and one "*maternity*")	2011-2019	0.1km east

4.4.3 The data show that the majority of the protected and notable species listed in **Table 4-4** are widespread and occur in a number of locations. As would be expected from the area the majority of species identified are commonly associated with woodland, grassland or aquatic habitats. **Figure 23.12, Volume 3** of the PEIR provides the distribution of bat records provided by SxBRC, whilst **Figure 23.15, Volume 3** of the PEIR shows the distribution of records of herptiles. **Figure 23.16, Volume 3** of the PEIR provides the distribution of mammal records (excluding bats) provided by SxBRC.

Invertebrates

4.4.4 A total of 8,513 records of 524 species of invertebrates were returned by SxBRC within 5km of the PEIR Assessment Boundary, with particular emphasis on lepidoptera and coleoptera. Of these, 16 records of 12 species were identified within the PEIR Assessment Boundary, including:

- four records of brown hairstreak *Thecla betulae* (SPI);
- two records of a beetle *Pilemostoma fastuosa* (notable A[10]);
- one record of a beetle *Anobium inexspectatum* (notable B[10]);

[10] Nationally Scarce species estimated to occur within the range of 16 to 100 ten-kilometre squares in Great Britain. This includes: species categorised into two Nationally Notable groups pre-1994: Notable A and Notable B (with some species not categorised and listed as Notable); and species categorised into two Nationally Scarce groups post-1994: Nationally Scarce A and Nationally Scarce B (with some species not categorised and listed as Nationally Scarce).

- one record of chalk hill blue Polyommatus coridon (Red List GB (2001): Nationally Threatened);
- one record of long-winged cone-head *Conocephalus fuscus* (Sussex rare);
- one record of Roesel's bush-cricket *Metrioptera roeselii* (Sussex rare);
- one record of small heath *Coenonympha pamphilus* (SPI);
- one record of a spider *Ballus chalybeius* (nationally scarce);
- one record of a true bug *Lygus pratensis* (Red List GB (pre-1994): Rare);
- one record of a true bug *Corizus hyoscyami* (Sussex rare);
- one record of a true bug *Stictopleurus punctatonervosus* (Sussex rare); and
- one record of white admiral *Limenitis Camilla* (SPI).

4.4.5 Four species of invertebrate that are of particular interest due to being listed as Annex II and/or Annex IV species[11] and have been identified within the study area (all are outside of the PEIR Assessment Boundary) include:

- Desmoulin's whorl snail (one record);
- Jersey tiger (three records);
- Little whirlpool ram's-horn snail (one record); and
- Stag beetle *Lucanus cervus* (181 records).

4.4.6 There are 46 species of butterfly considered to be on the "Sussex list" (Sussex branch of Butterfly Conservation identify records of 52 species with seven considered to be rare or occasional visitors only) with records of 15 of these species provided for the study area.

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4.4.7 Additional records obtained for the A27 bypass project (Highways England, 2019), located within 5km of the PEIR Assessment Boundary identified the presence of the following:

- amphibians: one pond with significant numbers of common toad;
- badger: present – individual records not provided due to confidentiality;
- bat roosts: six alcathoe bat, two barbastelle bat, five Bechstein's bat, seven brown long-eared bat, five common pipistrelle, one Daubenton's bat, six Natterer's bat, four soprano pipistrelle, four whiskered bat, and three unknown bat species;
- dormouse: presence recorded across seven sites with a peak count of two;

[11] The Conservation of Habitats and Species Regulations 2017 (also known as the Habitats Regulations). A4 = Annex IV species. A2 = Annex II species.

- invertebrates: 41 terrestrial species regarded as notable across 15 sites, and three aquatic species regarded as notable across five sites;
- otter: signs recorded across three ponds and six ditches in the form of potential holts and laying up sites;
- reptiles: one adder,12 grass snakes, 68 common lizards and 157 slow worms across 10 sites; and
- water vole: signs recorded across four ponds and 37 ditches in the form of latrines, feeding remains, pathways, splashing sounds and burrows.

MAVES Ecological Survey Reports 2017 and 2018

4.4.8 A review of the 2017 and 2018 MAVES ecological survey reports identified the presence of the following protected and/or notable species within 5km of the PEIR Assessment Boundary, to the east and south of Arundel:

- amphibians: widespread common toad records including more than 1000 individuals breeding within Madonna Pond in 2017;
- badger: present – individual records not provided due to confidentiality;
- bats: records of 13 species of bat, including Bechstein's and barbastelle. Eight of these species may have maternity colonies within the Binstead Woods Complex, including Bechstein's and alcathoe. A total of four alcathoe roosts and three Bechstein's roosts have been recorded;
- dormouse: eleven dormouse nests were recorded within Binstead Woods Complex and connected habitat, including a record of 16 dormice within one box;
- invertebrates: 30 butterfly species including purple emperor *Apatura iris*, dingy skipper *Erynnis tages*, white admiral *Limenitis camilla* and purple hairstreak *Favonius quercus;* 40 species of moth including seven SPI; 17 species of dragonfly and damselfly; and 230 species of beetle including stag beetle and one Red Data Book species and 10 nationally scarce species. Specific survey work in 2016/2017 recorded 29 nationally scarce species, three SPI and six Red Data Book species;
- mammals (excluding bats): records of the SPIs brown hare, hedgehog and harvest mouse;
- reptiles: four records of adder and numerous records of common lizard, grass snake and slow worm; and
- water vole: signs including burrows, feeding remains, latrines and footprints within the vicinity of Binstead Rife.

4.5 Ornithological records

Overview

4.5.1 Ornithology records were provided directly by SOS (see **Figure 23.2, Volume 3** for all tetrads that are within or overlap with the Scoping Boundary) and RSPB. Further information was gathered from the BTO website.

4.5.2 **Table 4-5** provides details of breeding Schedule 1[12] bird records compiled by SOS in the last 10 years (2010-2020). Thirteen species were identified as breeding in the area, with some of these being relatively frequent and widespread, whilst others have only been noted occasionally.

Table 4-5 Schedule 1 bird records

Species	No. of records	Notes
Quail *Coturnix coturnix*	14	The majority of these records are from the area around Burpham and Warningcamp
Gargeney *Anas querquedula*	3	The locations were associated with the Arundel WWT reserve and the Henfield Levels.
Mediterranean gull *Larus melanocephalus*	11	The records are all reported from the Arundel WWT reserve.
Goshawk *Accipiter gentilis*	1	Record from woodland between Crabtree and Bolney
Marsh harrier *Circus aeruginosus*	4	The records are all reported from the Arundel WWT reserve.
Red kite *Milvus milvus*	56	Observations across a wide area including Angmering, Amberley and Burpham.
Barn owl *Tyto alba*	195	Observations across a wide area including Burpham, Partridge Green, Henfield, Steyning, Twineham Green and Sayers Common
Kingfisher *Alcedo atthis*	15	Observations all linked to the Arun Valley
Hobby *Falco Subbuteo*	15	Observations widely spread from Angmering, Burpham and Twineham Green.

[12] Wildlife and Countryside Act 1981 (as amended), Schedule 1.

Species	No. of records	Notes
Peregrine *Falco peregrinus*	48	Observations widely spread including around Washington, Storrington, Arundel, Wepham Down and Twineham
Woodlark *Lullula arborea*	8	Nine of ten records were from the area around Twineham
Cetti's warbler *Cettia cetti*	438	Widespread across the area within the Scoping Boundary
Firecrest *Regulus ignicapillus*	67	Records reported in the Arundel area, Chanctonbury Ring and woodland around Angmering

4.5.3 SOS also provided extensive records of birds listed as SPI (including breeding and non-breeding records) recorded between 2000 and 2020. A total of 39,452 records of 39 species were received; these records are summarised in **Table 4-6**.

Table 4-6 Records of species of principal importance from Sussex Ornithological Society

Species	Number of records
Bewick's swan	1,018
Bittern	48
Black-tailed godwit	151
Bullfinch	1,679
Common cuckoo	751
Common scoter	132
Corn bunting	888
Dark-bellied brent goose	411
Dunnock	4,279
Eurasian Curlew	198
European greater white-fronted goose	40
Grasshopper warbler	60
Greater scaup	10
Grey partridge	1,132

Species	Number of records
Hawfinch	201
Hen harrier	486
Herring gull	3,663
House sparrow	2,931
Lesser redpoll	293
Lesser spotted woodpecker	69
Linnet	2,038
Marsh tit	629
Nightjar	66
Northern lapwing	3,432
Reed bunting	2,357
Ring ouzel	129
Skylark	2,333
Song thrush	3,656
Spotted flycatcher	298
Starling	3,340
Stone curlew	7
Tree pipit	62
Tree sparrow	15
Turtle dove	287
Willow tit	19
Woodlark	28
Wood warbler	16
Yellow wagtail	292
Yellowhammer	1,918

4.5.4 RSPB supplied two records of displaying stone curlew recorded in the last 10 years, both within the Scoping Boundary. One of these records was in the area between Amberley and Burpham in arable habitat, whilst the other was between Washington and Steyning in an area that supports both downland and arable habitats.

4.5.5 RSPB supplied 309 records of breeding lapwing recorded in the last 10 years including adults nesting, displaying and feeding and chicks and juveniles. Birds were noted in both grassland and arable habitats and were widespread across the area. SOS provided a further 424 breeding records of lapwing in the last 10 years, many of these records are associated with the Wildfowl and Wetlands Trust reserve at Arundel. The tetrads that are known to support breeding lapwing are shown on **Figure 23.14, Volume 3**.

4.5.6 The BTO have five WeBS count sites (see **Table 4-7**) in the Scoping Boundary or within 1km of it that have been counted consistently between 2014/15 and 2018/19. These count sites support large numbers of birds over the winter and passage periods. Wildfowl including gadwall and shelduck, whilst waders such as lapwing, black-tailed godwit, grey plover, ringed plover and sanderling are common. The presence of certain species changes with the location and type of habitat present in each count site.

4.5.7 Of the species named in the designation material for Arun Valley SPA/Ramsar site and Pagham Harbour SPA/Ramsar site Bewick's swan.

Table 4-7 WeBS Records

Species	Count Site	Number
Bewick's swan	Climping	0
Dark-bellied brent goose	Climping	358
Shoveler	Climping	0
Teal	Climping	0
Wigeon	Climping	0
Bewick's swan	River Arun – Arundel to Littlehampton	4
Dark-bellied brent goose	River Arun – Arundel to Littlehampton	0
Shoveler	River Arun – Arundel to Littlehampton	2
Teal	River Arun – Arundel to Littlehampton	17
Wigeon	River Arun – Arundel to Littlehampton	93
Bewick's swan	Arun Valley	20
Dark-bellied brent goose	Arun Valley	0

Species	Count Site	Number
Shoveler	Arun Valley	228
Teal	Arun Valley	2,157
Wigeon	Arun Valley	3,825
Bewick's swan	Henfield Rye Farm	0
Dark-bellied brent goose	Henfield Rye Farm	0
Shoveler	Henfield Rye Farm	10
Teal	Henfield Rye Farm	112
Wigeon	Henfield Rye Farm	68
Bewick's swan	Henfield Brooks	2
Dark-bellied brent goose	Henfield Brooks	0
Shoveler	Henfield Brooks	4
Teal	Henfield Brooks	32
Wigeon	Henfield Brooks	183

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4.5.8 Additional records obtained for the A27 bypass project by Highways England, when within 5km of the draft order limits, identified the presence of the of one active barn owl roost.

MAVES Ecological Survey Reports 2017 and 2018

4.5.9 A review of the 2017 and 2018 MAVES ecological survey reports identified the presence of the following within the MAVES study area:

- schedule 1: nine species;
- BoCC[13] Red Listed[4]: 20 species;
- BoCC Amber Listed[4]: 21 species; and
- seventeen bird species have Biodiversity Actions Plans.

[13] Birds of Conservation Concern.

4.6 Legally controlled species

Overview

4.6.1 Records of non-native invasive species that are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were returned by SxBRC within 5km of the PEIR Assessment Boundary.

4.6.2 For the purposes of this report, invasive species records have been divided into botanical and faunal records. A total of 330 botanical records of 28 species and 3,140 faunal records of 22 species were identified. Of these, three botanical records and 53 faunal records are from within the PEIR Assessment Boundary. These records have been summarised in **Table 4-8** below.

Table 4-8 Legally controlled species within 5km of the PEIR Assessment Boundary

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Flora			
Canadian waterweed *Elodea canadensis*	20	2012	4.2km south-east
***Cotoneaster* sp.**	4	2012-2016	0.8km north
Curly waterweed *Lagarosiphon major*	3	2014-2016	2.2km north-west
False Virginia creeper *Parthenocissus inserta*	3	2013-2015	2.0km east
False-acacia *Robinia pseudoacacia*	3	2011-2017	2.3km east
Few flowered leek *Allium paradoxum*	3	2013-2016	1.4km north-west
Floating pennywort *Hydrocotyle ranunculoides*	2	2011-2014	0.04km north-east

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Franchet's Cotoneaster *Cotoneaster franchetii*	1	2014	4.3km south-east
Giant hogweed *Heracleum mantegazzianum*	3	2010-2014	Within PEIR Assessment Boundary
Giant rhubarb *Gunnera tinctoria*	1	2012	3.0km south
Himalayan cotoneaster *Cotoneaster simonsii*	4	2011-2016	0.6km east
Hybrid knotweed *Fallopia japonica x sachalinensis = F. x bohemica*	1	2013	0.1km south-east
Indian balsam *Impatiens glandulifera*	57	2010-2019	0.2km south-east
Japanese knotweed *Fallopia japonica*	21	2010-2018	0.03km south
Japanese rose *Rosa rugosa*	11	2010-2019	0.5km north-west
Montbretia *Crocosmia pottsii x aurea = C. x crocosmiiflora*	30	2010-2018	0.02km south-east
New Zealand pygmyweed *Crassula helmsii*	10	2010-2016	Within PEIR Assessment Boundary
Nuttall's waterweed *Elodea nuttallii*	48	2010-2017	Within PEIR Assessment Boundary

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Parrot's-feather *Myriophyllum aquaticum*	5	2010-2015	0.5km north
Rhododendron ponticum	28	2010-2018	0.09km east
Small-leaved cotoneaster *Cotoneaster integrifolius*	1	2011	0.8km north
Three-cornered garlic *Allium triquetrum*	16	2010-2019	0.03km south-east
Tibetan Cotoneaster *Cotoneaster conspicuus*	3	2011-2014	1.3km west
Variegated yellow archangel *Lamiastrum galeobdolon subsp. argentatum*	23	2010-2018	0.5km north
Virginia creeper *Parthenocissus quinquefolia*	4	2011-2017	0.8km south
Wall cotoneaster *Cotoneaster horizontalis*	16	2010-2017	0.4km south-west
Water fern *Azolla filiculoides*	6	2011-2017	0.7km south-east
Yellow Azalea *Rhododendron luteum*	3	2011-2012	2.5km south
Fauna			
American mink *Neovison vison*	26	2010-2019	0.53km south-east

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Bar-headed goose *Anser indicus*	41	2010-2018	0.009km west
Barnacle goose *Branta leucopsis*	64	2010-2018	Within PEIR Assessment Boundary
Black swan *Cygnus atratus*	38	2010-2017	0.019km south-east
Canada goose *Branta canadensis*	1,803	2010-2019	Within PEIR Assessment Boundary
Chinese muntjac *Muntiacus reevesi*	4	2010-2019	0.8km south-east
Egyptian goose *Alopochen aegyptiacus*	184	2010-2019	Within PEIR Assessment Boundary
European pond terrapin *Emys orbicularis*	1	2013	4.9km north
Golden pheasant *Chrysolophus pictus*	1	2015	3.8km east
Grey squirrel *Sciurus carolinensis*	96	2010-2020	Within PEIR Assessment Boundary
Lesser Canada goose *Branta canadensis subsp. parvipes*	5	2015	1.5km south-east
Mandarin duck *Aix galericulata*	835	2010-2019	0.1km east

Species	No. of records	Date range of records	Distance and direction from the PEIR Assessment Boundary
Marsh frog *Pelophylax ridibundus*	3	2010-2013	2.9km north-west
New Zealand flatworm *Arthurdendyus triangulatus*	1	2014	1.8km south-east
Pumpkinseed sunfish *Lepomis gibbosus*	1	2012	0.3km north-west
Red-crested pochard *Netta rufina*	15	2010-2018	0.25km north-east
Reeve's pheasant *Syrmaticus reevesii*	1	2011	4.7km south-east
Ring-necked parakeet *Psittacula krameri*	2	2017-2018	1.6km south
Ruddy duck *Oxyura jamaicensis*	8	2011-2015	1.4km south-east
Ruddy shelduck *Tadorna ferruginea*	5	2014-2018	1.5km south-east
Snow goose *Chen caerulescens*	2	2010	4.7km south-east
Wood duck *Aix sponsa*	4	2011-2018	1.6km south-east

MAVES Ecological Survey Reports 2017 and 2018

4.6.3 A review of the 2017 and 2018 MAVES ecological survey reports identified records of rhododendron within 5km of the PEIR Assessment Boundary.

5. Glossary

Table 5-1 Glossary of terms and abbreviations

Term (acronym)	Definition
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
cSAC	candidate Special Area of Conservation
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Habitats Regulation Assessment (HRA)	The assessment of the impacts of implementing a plan or policy on a European Site, the purpose being to consider the impacts of a project against conservation objectives of the site and to ascertain whether it will adversely affect the integrity of the site.
Habitats Regulations	EC Council Directive 92/43/EEC, known as the Habitats Directive, was transposed in the UK by the Habitats Regulations 1994 (as amended). The Habitats Regulations apply to UK land and territorial waters and act to ensure biodiversity of natural habitats and of wild flora and fauna through a range of measures including designation of SACs.
HPI	Habitats of Principal Importance
IUCN	International Union for Conservation of Nature
LNR	Local Nature Reserve
Local Wildlife Site (LWS)	Local Wildlife Sites are non-statutory designations conferred by local planning authorities and given weight through local planning policy. These sites are selected through a selection of criteria (criteria are area dependent) aimed at identifying "substantive nature conservation value".
m	metres
MAVES	Mid-Arun Valley Environmental Survey
NBN	National Biodiversity Network
NERC Act	Natural Environment and Rural Communities Act

Term (acronym)	Definition
NNR	National Nature Reserve
NPS	National Policy Statement
NRV	Notable Road Verges
Onshore part of the PEIR Assessment Boundary	An area that encompasses all planned onshore infrastructure.
PEIR Assessment Boundary	The PEIR Assessment Boundary combines the search areas for the offshore and onshore infrastructure associated with the Proposed Development. It is defined as the area within which the Proposed Development and associated infrastructure will be located, including the temporary and permanent construction and operational work areas.
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken to date for the Proposed Development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.
RSPB	Royal Society for the Protection of Birds
Scoping Report	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
SDNPA	South Downs National Park Authority
Site of Special Scientific Interest (SSSI)	Sites designated at the national level under the Wildlife & Countryside Act 1981 (as amended). They are a series of sites that are designated to protect the best examples of significant natural habitats and populations of species.
SOS	Sussex Ornithological Society
Special Area of Conservation (SAC)	International designation implemented under the Habitats Regulations for the protection of habitats and (non-bird) species. Sites designated to protect habitats and species on Annexes I and II of the Habitats Directive. Sufficient habitat to maintain favourable conservation status of the particular feature in each member state needs to be identified and designated.

Term (acronym)	Definition
SPI	Species of Principal Importance
SxBRC	Sussex Biodiversity Records Centre
The Applicant	Rampion Extension Development Limited (RED)
The Proposed Development / Rampion 2	The onshore and offshore infrastructure associated with the offshore wind farm comprising of installed capacity of up to 1,200MW, located in the English Channel in off the south coast of England. The development that is subject to the application for development consent, as described in Chapter 4.
UK	United Kingdom
WeBS	Wetland Bird Survey

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4.23.3

Rampion 2 WIND FARM

Volume 4, Appendix 23.3

Onshore winter bird report 2020-2021

GoBe wood.

Contents

1. Introduction

1.1 Background

1.1.1 This appendix should be read in conjunction with **Chapter 23: Terrestrial ecology and nature conservation, Volume 2** of the Preliminary Environmental Information Report (PEIR) which is provided in support of the delivery of an Environmental Impact Assessment (EIA) associated with the Rampion 2 Offshore Wind Farm, hereafter referred to as the 'Proposed Development' or 'Rampion 2'. At this stage, the description of the Proposed Development is indicative and a 'design envelope' approach has been adopted which takes into account Planning Inspectorate (PINS) Advice Note Nine: Rochdale Envelope, Version 3, July 2018 (PINS, 2018). The provision of a design envelope is intended to identify key parameters to enable the environmental assessment to be carried out whilst retaining enough flexibility to accommodate further refinement during detailed design. Further details on the use of the Rochdale Envelope as recommended by the National Policy Statement for Renewable Energy (NPS EN-3) (Department of Energy and Climate Change (DECC), 2011) are provided in **Chapter 2: Policy and legislative context, Volume 2**.

1.1.2 At the PEIR stage, the key components of the Proposed Development are separated into offshore and onshore elements. The offshore elements of the Proposed Development comprise offshore wind turbine generators (WTGs) and associated foundation, inter-array cables with and installed capacity of up to 1,200 megawatts (MW) but not exceeding the number of WTGs installed at Rampion 1 (116). There will be up to three offshore substations and up to four offshore export cables, each installed in its own trench within the overall offshore cable corridor and up to two offshore interconnector export cables will be installed between the offshore substations.

1.1.3 The key onshore elements of the Proposed Development include a single landfall site and buried onshore cables in a single onshore cable corridor approximately 36km in length and a new onshore substation that will connect to the existing National Grid Bolney substation, Mid Sussex, via buried onshore cables.

1.1.4 Further information on the Proposed Development is provided in **Chapter 4: The Proposed Development, Volume 2**.

1.2 Purpose of this appendix

1.2.1 The onshore cable corridor and onshore infrastructure cross habitats and sites with the potential to support notable assemblages of wintering bird species associated with the Arun Valley Ramsar site and Special Protection Area (SPA), Solent and Dorset Coast SPA and Climping Beach Site of Special Scientific Interest (SSSI). This appendix outlines the methodologies used, and summarises the results gathered as part of an assessment for wintering birds within proximity to the cable landfall site and the onshore cable corridor; with emphasis on the

intertidal area at Climping Beach, the Arun and Adur Valleys, and the floodplains / wet meadows immediately surrounding.

1.2.2 Surveys were completed during the wintering period between September 2020 and March 2021 (where designated species are most likely to be encountered) following two methodologies:

- intertidal surveys; and
- winter bird surveys

1.2.3 The winter bird surveys were designed to identify the distribution, density and activities of wintering birds within, and close to, the PEIR Assessment Boundary using functionally linked habitat[1].

1.3 Structure of this appendix

1.3.1 This appendix is structured as follows:

- **Section 2: Methods;**
- **Section 3: Results;**
- **Section 4: Glossary of terms and abbreviations;**
- **Section 5: References:**
- **Annex A: Figures;**
- **Annex B: Secondary species records;** and
- **Annex C: Full survey details.**

[1] Functionally linked habitat is broadly considered to be habitat within a species-specific critical distance from an SPA, where designated features can be found utilising habitat outside of the designated sites. The concept is discussed fully in Chapman, C. & Tyldesley, D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions. Natural England Commissioned Reports, Number 207.

2. Methods

2.1 Desk study

2.1.1 An environmental desk study was undertaken to identify statutory designated sites of international and national importance for ornithology within 10km of the PEIR Assessment Boundary, and non-statutory designated sites of ornithological importance within 5km of it. The search was carried out using the website MAGIC (an internet-based GIS database provided by the Department for Environment, Foods and Rural Affairs (Defra) (Defra, 2021)). Information on the designated sites identified was gathered from the websites of Natural England (Natural England, 2021) and the Joint Nature Conservation Committee (JNCC) (JNCC, 2021).

2.1.2 In addition to the environmental desk study for designated sites, species specific data was gathered from the Royal Society for the Protection of Birds (RSPB), Sussex Ornithological Society (SOS) and Sussex Biodiversity Record Centre (SxBRC) within 2km of the PEIR Assessment Boundary[2]. Species specific data was requested for all protected or notable species occurring in winter.

2.2 Intertidal survey

2.2.1 Intertidal surveys were undertaken between September 2020 and March 2021 inclusive, as there is the potential for important numbers of wintering birds to occur within the PEIR Assessment Boundary, particularly along the coastline. The purpose of the intertidal bird survey was to collect data to confirm the typical distribution and assemblages of waterbird[3] species associated with nearby designated sites (see **Section 3.1**). The surveys followed the so-called 'look-see' methodology (Bibby *et al.* 2000), whereby the observer undertakes a census of all waterbird species within a predefined waterbody / wetland area. The surveys focussed on the diurnal distribution of birds, and movements across tidal cycles.

Data collection locations

2.2.2 The survey focused on intertidal habitats and fields directly behind the seawall within 1km of the cable landfall location. For the purposes of the intertidal survey, this area was divided into two survey sectors. These survey sectors were observed simultaneously by two surveyors (**Figure 23.3.1, Annex A**). The survey employed a roving observation point technique, used to observe all birds within the sectors during the survey period.

[2] The exact distance varied for the record search provided by SOS as their data is specified by tetrad.

[3] Waterbirds are here considered to be birds that frequent water, especially habitual wading, or swimming birds. This term includes ducks, geese, swans and their relatives; seabirds; herons, egrets and storks; grebes and divers; wading birds; gulls and terns; and rails, crakes and allies. All waterbirds are considered non-passerine.

2.2.3 Full survey details, including visit dates, times and weather conditions are available in **Table C1, Annex C**.

Data collection methods

Instantaneous Scan Samples

2.2.4 Instantaneous Scan Samples (ISS) are 'snapshots' that record how waterbirds use each survey sector within an area at a given interval. On each survey date two surveyors undertook six hours of simultaneous survey, one located within each sector in order to observe any changes / patterns in the distribution of waterbirds across the tide. During each six-hour period, a series of seven ISS counts were undertaken using the 'look-see' methodology (Bibby *et al.* 2000) at 60-minute intervals within each sector, the first being at the start of the survey. ISS intervals were chosen to coincide with tidal movements with surveys observing high tide +/- 3 hours, and low tide +/-3 hours, each month. The species present, number and behaviour of all target[4] species was recorded on a new field map for each ISS.

2.2.5 All other wildfowl and wader species recorded during the surveys are considered secondary species, these were recorded to provide an accurate representation of birds utilising the survey sectors. These birds had the same information as recorded for target species.

2.2.6 Surveyors started at the same time and remained in contact throughout the survey to minimise the risk of double counting at count sector boundaries. Bird activity was recorded using four categories:

- feeding / foraging;
- loafing / preening;
- roosting; and
- other (specified by the surveyor).

2.2.7 Each ISS count plotted flocks or single birds accurately on the field map and counts were tallied for each species and activity.

2.2.8 In addition to ISS, where species peak counts were observed outside of, but between ISS, the peak counts of species present were noted with an accurate timestamp. Therefore, peak counts of birds were recorded within the survey period, even if not occurring during the ISS.

2.2.9 As disturbance was considered a potential factor influencing survey results, the number of people using the beach during each ISS was noted to assess baseline conditions and ascertain the influence of their presence upon the results of the survey.

[4] Target species for the Intertidal survey are species included on the designations of the Solent and Dorset Coast SPA and the Climping Beach SSSI. These species are identified in **Table 3.1**.

Deviations, constraints and limitations

2.2.10 Intertidal surveys aim to undertake two surveys per month covering the high tide period +/- 3 hours and a low tide period +/-3 hours. Due to the commencement date of the survey, there were not two suitable tidal ranges during the September 2020 recording period. The first visit was therefore undertaken on the 24 September 2020 with the second visit (also considered herein as September) being on 02 October 2020. This lapse of two days is considered a minor deviation. There were no other deviations during the intertidal survey period.

2.2.11 Typically target species are prioritised for detailed recording on occasions when there are large numbers of waterbirds present in an area. Although the survey method was set up to allow for this, the relatively small number of birds (compared, for example, to large areas of intertidal mudflat) present in the count sectors throughout the winter of 2020/2021 did not require a switch to the recording of coarser grained information for secondary species.

2.3 Winter bird surveys

2.3.1 Due to the proximity of the onshore cable corridor to the Arun Valley Ramsar site and SPA, winter bird surveys targeting wildfowl and wading birds associated with the SPA / Ramsar and the underlying SSSI designations (at Pulborough Brooks and Amberley Wild Brooks) were undertaken. These targeted the floodplains and wet fields within and close to the onshore part of the PEIR Assessment Boundary on the River Arun and River Adur floodplains between September 2020 and March 2021 inclusive. The purpose of the winter bird survey is to collect data on the distribution and assemblages of waterbird species that utilise this land as functionally linked habitat from the nearby designated sites. The surveys focussed on diurnal distribution of target species throughout the winter bird survey period.

Data collection locations

2.3.2 The winter bird survey focused on the floodplains and fields surrounding the River Arun and River Adur within onshore part of the PEIR Assessment Boundary and within 500 metres of it. For the purposes of the winter bird survey, this area was divided into two survey areas. These survey areas were observed simultaneously by two surveyors (**Figures 23.3.2** and **23.3.3, Annex A**). The survey employed a roving observation point technique, used to observe all birds within the survey areas during the survey period.

2.3.3 Following an initial scoping assessment in September 2020, winter bird surveys were undertaken within the potential functionally linked habitat on a monthly basis between 28 September 2020 and 12 March 2021. Full survey details, including dates, times and weather conditions can be found in **Annex C**, **Table C2.**

Data collection methods

2.3.4 The winter bird survey covered two survey areas, both observed on a single day allowing a snapshot record of the number and distribution of wintering birds

present each month to be recorded, whilst minimising the chance of duplicate counts.

2.3.5 The aim of these surveys was to determine whether any of the notable species defined below, regularly feed or roost within or close to the onshore part of the PEIR Assessment Boundary.

2.3.6 Notable species are defined as:

- species listed as notified features on nearby designated sites: Bewick's swan, shoveler, teal, wigeon, pintail and ruff;
- all other waders and wildfowl (excluding feral/domestic birds, mallard, Canada goose and greylag goose) for consideration to overall winter assemblage number;
- species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- species listed on Annex 1 of the EU Birds Directive; and
- birds of Conservation Concern (BoCC) red list species (Eaton *et al*., 2015).

2.3.7 Surveyors recorded accurate locations of species directly onto survey maps recording the following details:

- species (using standard British Trust for Ornithology (BTO) 2-letter codes);
- number of individuals;
- location of records; and
- activity (foraging, loafing, roosting, etc.).

2.3.8 The presence of species that do not qualify as notable using the criteria were noted to record a full species list for each survey area, however, information on numbers, distribution and behaviour were not recorded.

2.3.9 All winter bird surveys avoided heavy rain, or strong or cold winds, minimising variation in bird activity levels due to weather conditions, wherever possible. All visits started at least an hour after dawn and were completed by 15:00 hours.

Deviations, constraints and limitations

2.3.10 There were no deviations from the proposed methodology during the winter bird surveys.

2.3.11 An identifiable constraint was a lack of land access across parts of the survey area, although many areas of open floodplain can be viewed from highways / byways and Public Rights of Way.

2.3.12 **Figures 23.3.2** and **23.3.3, Annex A** represent the areas where suitable coverage was available with the survey area, the blank gaps within the floodplains represent areas where access was not possible. In **Figure 23.3.2, Annex A** the area shown between the River Arun and the railway near Littlehampton was not fully visible due to the raised railway embankment. Surveyors spent time in the area to try to

audibly record any target species. There were no constraints to access within the areas shown on **Figure 23.3.3, Annex A**.

2.3.13 Counts undertaken at the private waterbodies by St Mary Magdalene's Church are considered to be minimum counts as visibility was limited due to fencing / vegetation / banks. Although restricted viewing resulted in minimum total counts rather than unrestricted counts, it is not considered that these counts were grossly inaccurate. Approximately 80% of the waterbodies could be viewed at any one time, with surveyor movement between three or four viewing areas (dependent on height of surveyor and visibility through vegetation) taking less than two minutes. It is not likely that birds moving around within the waterbody would be counted as duplicates, but birds may not be recorded if moving to areas previously checked by surveyors. These counts we judged by the surveyors as being accurate to within ~10% of total number of birds present.

2.3.14 Contrastingly, if access was available to these waterbodies, the presence of surveyors entering the site would undoubtably have flushed the target species from the area causing unnecessary disturbance, potentially resulting in a less accurate assessment of behaviours.

2.3.15 Despite the limitations described above the dataset is considered to provide a robust approximation of the waders and wildfowl population present during daylight hours on the relevant sections of the River Arun and Adur floodplains in the winter of 2020/21.

3. Results

3.1 Statutory designated sites of ornithological importance

3.1.1 Ten designated sites were identified within the search area as sites of ornithological importance, with five sites principally designated for over-wintering species. See **Table 3-1** below.

3.1.2 Three statutory designated sites of international importance were identified within 10km of the PEIR Assessment Boundary, these are identified in **Table 3-1**. Seven nationally designated sites of ornithological importance were identified within 5km of the PEIR Assessment Boundary. None of these sites are within or overlap with the PEIR Assessment Boundary.

Table 3-1 Details of statutory designated sites of ornithological importance.

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
Internationally important sites		
Arun Valley SPA	Bewick's swan (non-breeding) Waterfowl assemblage (non-breeding): including shoveler, teal, wigeon and Bewick's swan.	3.8km north-west
Arun Valley Ramsar	Qualifies under Ramsar Criterion 5 for winter assemblage of international importance: 13774 waterfowl.	3.8km north-west
Solent and Dorset Coast SPA	Sandwich tern (breeding), Common tern and little tern (breeding)	2.3km south-west
Nationally important sites		
Amberley Wild Brooks SSSI	Redshank (breeding) Bewick's swan, shoveler and teal (non-breeding). Breeding bird assemblage – mixed lowland damp grassland, woodland.	3.8km north-west

Site name	Designated features	Distance and direction from the PEIR Assessment Boundary
Arundel Park SSSI	Breeding bird assemblage – mixed: scrub, woodland	1.0km north-west
Chanctonbury Hill SSSI	Breeding bird assemblage – mixed: lowland damp grassland, woodland	0.6km south-east
Cissbury Ring SSSI	Breeding bird assemblage – mixed: scrub, woodland	4.5km south
Climping Beach SSSI	Sanderling – winter assemblage of up to 300 individuals represent 1% of West European population.	0.1km east
Pulborough Brooks SSSI	Non-breeding population of pintail, ruff, shoveler, teal and wigeon. Breeding bird assemblage – lowland damp grassland	5.0km north-west
Sullington Warren SSSI	Breeding bird assemblage – mixed: scrub, woodland	0.7km east

3.1.3 Though these designated sites do not overlap with the PEIR Assessment Boundary at any point, there is the potential for birds notified on these designations to utilise the habitats that the onshore cable corridor crosses, it is therefore necessary to assess these habitats as potentially functionally linked.

3.1.4 The following species are listed as individual qualifying features of the designated sites (see **Paragraphs 3.1.5** to **3.1.9**) or as part of the relevant overwintering assemblages relevant to the winter bird survey effort:

- **SPA and Ramsar listed**: Bewick's swan *Cygnus columbianus bewickii*, common tern *Sterna hirundo*, little tern *Sterna albifrons*, sandwich tern *Sterna sandvicensis*, shoveler *Spatula clypeata*, teal *Anas crecca*, wigeon *Mercea penelope*, pintail *Anas acuta* and ruff *Calidris pugnax*; and
- **SSSI listed**: Sanderling *Calidris alba*.

3.1.5 The Arun Valley SPA / Ramsar site lies 3.8km north-west of the onshore cable corridor, between Pulborough and Amberley within the River Arun Valley in West Sussex. The SPA / Ramsar site consists of three component SSSI (Amberley Wild Brooks SSSI; Pulborough Brooks SSSI and Waltham Brooks SSSI). Together these sites comprise an area of wet meadows on the floodplain of the River Arun. The neutral wet grassland which is subject to winter, and occasional summer flooding, is dissected by a network of ditches, several of which support rich aquatic

flora and invertebrate fauna. The combined area of these three component sites is 529 hectares, with both SPA and Ramsar designations covering the same area.

3.1.6 The Arun Valley SPA qualifies under Article 4.1 qualification (Council Directive 79/409/EEC, 1979 [as amended]). Over winter, the area regularly supports: Bewick's swan (Western Siberia/North-eastern & North-western Europe) 1.6% of the population in Great Britain (GB) 5 year peak mean for 1992/93 to 1996/7 and Article 4.2 qualification (79/409/EEC): An internationally important assemblage of birds, over winter the area regularly supports: 27241 waterfowl (5 year peak mean 1991/92-1995/96) Including: Bewick's swan.

3.1.7 The Arun Valley Ramsar is considered an area of outstanding ornithological importance notably for wintering wildfowl and breeding waders. The site qualifies as a Ramsar under criterion 5 assemblages of international importance: Species with peak counts in winter: 13,774 waterfowl (5-year peak mean 1998/99-2002/03). Noteworthy fauna include: Eurasian wigeon, North-west Europe 4,742 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9 – 2002/3); Eurasian teal, North-west Europe, 2,931 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9 – 2002/3); Northern shoveler, North-west and Central Europe, 222 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9 – 2002/3); and Ruff, Europe and West Africa, 27 individuals, representing an average of 3.8% of the GB population (5 year peak mean 1998/9-2002/3).

3.1.8 Climping Beach SSSI lies 0.1km east of the landfall site for the onshore cable corridor, between Atherington and Littlehampton. The site is a stretch of coast with vegetated shingle beach, backed by a sand dune system. The intertidal zone supports important populations of wintering birds and the numbers of wintering sanderling, in particular, are of European significance.

3.1.9 Solent and Dorset Coast SPA lies 2.3km south-west of the landfall site for the onshore cable corridor at the nearest point; Middleton-on-Sea. The SPA is noted for importance to breeding tern populations, qualifying under Article 4.1 (79/409/EEC) during the breeding season as the area regularly supports: sandwich tern - 4.01% of the GB breeding population (5-year mean 2010-2014, 441 pairs). common tern - 4.77% of the GB breeding population (5-year mean 2009-2014, 492 pairs). little tern - 3.31% of the GB breeding population (5-year mean 2009-2014, 63 pairs).

3.1.10 All records of SPA and Ramsar listed species recorded during the onshore winter bird surveys are shown in **Figures 23.3.4 - 23.3.7 (**see **Annex C)**. These figures show cumulative count totals for each species recorded.

3.2 Species records

3.2.1 As part of the environmental desk study, species data for birds likely to be wintering within proximity of the onshore cable corridor were gathered from the RSPB, SOS and SxBRC. Records of dark-bellied brent goose and Bewick's swan in particular were considered notable due to their notifications on nearby statutory designated sites.

3.2.2 Dark-bellied brent goose are a qualifying feature of the nearby Pagham Harbour Ramsar under Ramsar criterion 6 – species / populations occurring at levels of international importance. 2,512 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3). Brent geese forage within intertidal areas and arable fields, often roosting and foraging within fields when the tidal state is unfavourable to forage. Brent goose are considered here as there is the potential for birds to utilise the area close to the landfall site.

3.2.3 The data requests returned 208 brent goose records and 443 Bewick's swan records within 2km of the onshore cable corridor, between winter of 2010/11 and 2020/21; records older than ten winter periods have been discounted as they are no longer considered accurate reflections of the status of target species within the area.

3.2.4 The majority of the brent goose records (201 of 208) are from Climping / Climping Beach / Elmer rocks area near where the proposed cable will make landfall; the average count of birds in the Climping area is 233 with records ranging from single birds to a peak count of 1,500. There were three records of brent goose in Partridge Green, towards the northern end of the onshore cable corridor. Two records in 2011: Six individuals 13 January 2011, and an unconfirmed report of 100 birds 20 August 2011. There was a lone bird with greylag geese 15 January 2015. The final four brent goose records returned were from Arundel or further south toward the coast.

3.2.5 The 443 Bewick's swan records from winter 2010/11 to 2020/21 reflect a regularly occurring winter herd of swans within the search area, records are summarised in **Table 3-2** below.

Table 3-2 Summary of Bewick's swan desk study records winter 2010/11 to 2020/21

Winter period	Number of records	Mean count	Peak count	Date of first record	Date of last record	Date of Peak count
2010/11	44	14.9	42	29/10/2010	05/03/2011	02/02/2011
2011/12	34	25.7	33	29/11/2011	20/02/2012	11-15/02/2012
2012/13	47	19.6	40	14/11/2012	10/03/2013	09/02/2013
2013/14	22	7.5	14	17/11/2013	28/02/2014	26/11/2013; 10-18/12/2013
2014/15	90	25.1	42	29/11/2014	25/02/2015	30/12/2014
2015/16	25	4.2	11	22/11/2015	27/02/2016	19/02/2016
2016/17	64	11.0	22	29/11/2016	03/03/2017	21/01/2017-26/01/2017
2017/18	21	6.3	13	05/12/2017	09/03/2018	14/01/2018

Winter period	Number of records	Mean count	Peak count	Date of first record	Date of last record	Date of Peak count
2018/19	49	8.7	14	04/11/2018	12/04/2019	06/01/2019
2019/20	34	3.4	6	29/10/2019	18/02/2020	05-18/02/2020
2020/21	13	9	14	22/12/2020	21/02/2021	12/02/2021
Total Mean*	40.3	12.3	22.8	20 November	28 February	11 February
The total mean is the sum of all yearly values / number of years recording (11). This row also provides: The mean number of annual records, mean annual Mean, peak mean, average arrival date, average departure date and average date of peak count.						

3.2.6 From Bewick's swan records returned as part of the environmental desk study, there is evidence of a regular wintering herd around Burpham / Wepham water meadows. This herd are regularly recorded in their wintering grounds >500m north / north-west of the onshore part of the PEIR Assessment Boundary; shielded from the onshore cable corridor by an escarpment and blocks of ancient woodland. The peak annual counts show overall decline reflecting the national trend for this declining winter visitor, there is also evidence suggesting reduction in overall numbers of birds returning to the area along with later arrival dates, earlier departure dates and overall shorter wintering presence within the wider area.

3.3 Intertidal survey

3.3.1 A total of 35 target and secondary species were recorded during the intertidal survey, including five target species that are a qualifying feature of the Arun Valley SPA / Ramsar site, Solent and Dorset Coast SPA, Climping Beach SSSI or Pulborough Brooks SSSI:

- three species are listed as individual qualifying features of the Arun Valley SPA and Arun Valley Ramsar site (pintail, teal and wigeon);
- one species is listed as an individual qualifying feature of the Solent and Dorset Coast SPA (sandwich tern);
- three species are monitored features of the Pulborough Brooks SSSI (pintail, teal and wigeon); and
- one species is a monitored feature of Climping Beach SSSI (sanderling).

3.3.2 **Table 3-3**, below, shows peak monthly counts of target species recorded during the intertidal surveys, September 2020 to March 2021. These peak counts represent the maximum number of target species within the survey area throughout the individual survey days. Peak counts presented below considered the outright peak number of birds during the survey effort and in-combination

counts of simultaneously obtained ISS results. The peak counts shown in bold represent the peak count during the survey period September 2020 – March 2021 inclusive.

Table 3-3 Monthly peak counts of target species recorded during the intertidal surveys (September 2020 to March 2021)

Species	Conservation Status*	September	October	November	December	January	February	March
Pintail	Amber	15	-	-	-	18	-	-
Sanderling	Amber	3	15	80	19	60	32	12
Sandwich tern	Annex I, Amber	3	2	-	-	-	-	-
Teal	Amber	-	-	-	-	2	1	-
Wigeon	Amber	13	2	-	-	18	19	-

* Annex I = Annex I of the EU Birds Directive; SPI = Species of Principal Importance; Red / Amber/ Green = BoCC red / amber / green listed species.

3.3.3 There were no records of Bewick's swan, common tern, little tern, ruff or shoveler during the intertidal surveys.

3.3.4 Pintail were recorded on three of 14 survey visits on 24 September 2020; 02 October 2020 and 13 January 2021. All records relate to birds flying over the sea within 300m of mean high water springs level. There was no evidence of birds foraging within the survey sectors. The peak pintail count was 18 birds on 13 January 2021, where the birds flew west an hour before high tide.

3.3.5 Sanderling were recorded on 10 of 14 survey visits, with records in every month from September 2020 to March 2021. The distribution of records was fairly even within the survey sectors, with 53% of records in Sector 2. Birds were regularly recorded foraging in small numbers across both sectors. The peak count was 80 birds roosting over high tide on 03 November 2020.

3.3.6 Sandwich tern were recorded on four of 14 visits, with all records between September and October 2020. All records were of birds foraging offshore, with a peak count of three birds on 02 October 2020.

3.3.7 Teal were recorded on three of 14 visits on 02 October 2020, 13 January 2021 and 12 February 2021. Records consisted three fly-over counts and a single record of a lone bird roosting (12 February 2021). There was no evidence of Teal foraging within the survey sectors. The peak count of teal was two birds on 13 January 2021.

3.3.8 Wigeon were recorded on four of 14 visits between 02 October 2020 and 22 February 2021. Numbers of birds recorded on visits remained low throughout the survey period, with a peak count of 18 birds flying over the sea on 13 January 2021. There were four observations of birds flying over the survey area, seven observations of birds loafing / preening on the sea and a single observation of eight birds foraging at high tide on 02 October 2020.

Secondary species

3.3.9 Secondary species account for 30 of the 35 species recorded during the intertidal surveys, including:

- Seven species listed on Annex I of the Birds Directive (Directive 2009/147/EC) (great northern diver, guillemot, little egret, Mediterranean gull, red-throated diver, sandwich tern and Slavonian grebe);
- Four Species of Principal Importance (SPI) (Natural Environment and Rural Communities Act (NERC), 2006) (common scoter, dark-bellied brent goose, herring gull and lapwing); and
- Five species listed on Birds of Conservation Concern (BoCC) Red list Eaton *et al*. (2015)[5] (common scoter, herring gull, lapwing, ringed plover and Slavonian grebe).

[5] **BoCC Red list** = The background to the establishment of a 'traffic light system' of conservation concern for UK birds is discussed in Gregory *et al.* (2002). The updated criteria and lists are detailed in Eaton *et al*. (2015). Broadly, 'Red-listed' species include

3.3.10 **Table 3-4** below, shows peak monthly counts of secondary species recorded during the intertidal surveys, September 2020 to March 2021. These peak counts represent the maximum number of secondary species within the survey area throughout the individual survey days. Peak counts presented below considered the outright peak number of birds during the survey effort and in-combination counts of simultaneously obtained ISS results. The peak counts shown in **bold** represent the peak count during the survey period September 2020 – March 2021 inclusive.

Table 3-4 Monthly peak counts of secondary species recorded during the intertidal surveys

SECONDARY SPECIES								
		Sept 2020	**Oct 2020**	**Nov 2020**	**Dec 2020**	**Jan 2021**	**Feb 2021**	**Mar 2021**
Black-headed gull	Amber	-	145	43	-	1	6	50
Common gull	Amber	-	178	18	-	-	70	2
Common Scoter	SPI, Red	19	1	1	4	18	4	1
Cormorant	Green	2	3	2	-	6	2	9
Dark-bellied brent goose	SPI, Amber	1	1	620	640	187	160	188
Dunlin	Amber	6	1	3	5	6	-	4
Gadwall	Amber	-	1	-	-	2	-	-
Gannet	Amber	5	-	-	2	1	14	2
Great crested grebe	Green	-	1	1	6	24	3	18
Great northern diver	Annex I, Amber	-	1	-	-	-	-	-
Grey plover	Amber	3	6	71	47	37	-	7
Guillemot	Annex I, Amber	-	-	-	1	1	-	-

Those that are globally threatened, have suffered a historical population decline in the UK (between 1800 and 1995) or have experienced rapid declines in their UK breeding population or contractions in their UK range of more than 50% over the past twenty-five years. Amber-listed' species include any species on the European Red List (Critically Endangered, Endangered or Vulnerable), these are detailed in Eaton *et al*. (2015).

SECONDARY SPECIES								
		Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021
Herring gull	SPI, Red	-	-	-	-	-	2	26
Knot	Amber	-	-	1	-	-	-	-
Lapwing	SPI, Red	-	-	-	-	-	16	-
Lesser black-backed gull	Amber	-	-	-	-	-	-	7
Mediterranean gull	Annex 1, Amber	149	56	26	9	13	20	6
Oystercatcher	Amber	6	16	7	4	12	8	15
Red-breasted merganser	Green	-	-	3	8	28	7	46
Red-throated diver	Annex I	1	-	1	12	7	2	1
Ringed plover	Red	14	4	19	27	4	7	3
Slavonian grebe	Annex I, Red	-	-	1	-	-	-	2
Turnstone	Amber	48	37	73	100	60	13	48

3.3.11 There were two secondary species recorded on all 14 survey visits: Mediterranean gull and Turnstone.

3.3.12 Mediterranean gull were recorded on all visits, with peak numbers ranging from two birds to 149 individuals recorded on 24 September 2020. Observations were spread across the count sectors and the tidal range, with birds foraging and preening / loafing widely within the recording area. Following the early autumn peak, numbers dropped in October 2020 to 56 birds before continuing to drop through November 2020 to a regular wintering number of five to 20 individuals.

3.3.13 Turnstone were the most frequently recorded species during the survey period, with 144 records across 14 visits. Observations were spread across the count sectors and the tidal range with most records (95 of 144) showing birds foraging along the strandline and shingle beach. There was a noticeable reduction in turnstone numbers during the high tide period, as birds moved to the groynes at Littlehampton to roost.

3.3.14 Of the remaining secondary species, dark-bellied brent goose, grey plover and common scoter were noted on 11 visits; with red-throated diver, great crested grebe and oystercatcher noted on 10 visits. Other secondary species were recorded less often, and in small numbers only typically <10 individuals excepting gannet, lapwing and red-breasted merganser where single flocks of 14, 16 and 46 respectively increased the peak/mean counts considerably.

3.3.15 There were 52 records of brent goose during the survey period with 28 records within Sector 1 and 24 records in Sector 2. Of these records 23 records were of flocks foraging, 21 records were of birds flying over the count sector and eight were of birds loafing / preening. The records are spread across the tidal range, though there are more records (28/52) during the low tide cycle of low tide+/-3hours, than of high tide +/-3 hours (24/52). Numbers of brent goose using the survey area peaked between late November 2020 (25/11/2020) to mid-December 2020 (09/12/20) visits with 620 and 650 birds, respectively. Brent goose were observed foraging in the fields directly behind the seawall and also foraging on the sea during early morning counts. There were no records of brent goose on the beach at Climping.

3.3.16 There were 57 records of grey plover during the survey period with 25 records within Sector 1 and 32 records in Sector 2. Grey plover used the beach and shingle areas within Sector 1 to forage frequently with 22 observations of birds foraging and three observations of preening / loafing. Sector 2 was predominantly used for preening / loafing with 20 of 32 observations noting those behaviours. There were seven records of grey plover foraging within Sector 2, and five fly-over records of birds moving between sectors or moving east toward Littlehampton. The peak count of grey plover was 40 individuals foraging within Sector 1 on 25 November 2020.

3.3.17 There were 21 records of common scoter during the survey period, with 14 records within 300m of the shore in Sector 1 and 7 records within 300m of the shore in Sector 2. Records were spread across the tidal range, with 13 observations of birds flying over sectors, seven loafing / preening and a single record of three birds foraging within 300m of the shoreline in Sector 1. The majority of records (19 of 21) were less than 10 birds, with the exception of 18 recorded on one occasion on 13 January 2021 and a peak count of 19 birds on 02 October 2020. Common scoter were regularly recorded outside of the recording area at more than 1 kilometre from the shoreline.

3.4 Winter bird survey results

3.4.1 Three target species were recorded during the winter bird surveys across the Arun and Adur Valleys within 500m of the onshore part of the PEIR Assessment Boundary: shoveler, teal and wigeon. These three species are listed as a qualifying feature of Arun Valley SPA / Ramsar site and Pulborough Brooks SSSI. There were no records of Bewick's swan, pintail or ruff during the winter bird survey.

3.4.2 There were five records of target species within the Arun Valley survey area and nine records of target species within the Adur Valley survey area. **Table 3-5** below, summarises all records of target species recorded within the winter bird survey.

Table 3-5 Summary of target species recorded during the winter bird surveys

Species	Date	UK National Grid reference	Number	Survey Area	Closest distance and direction to onshore part of the PEIR Assessment Boundary (metres)
Wigeon	16.10.2020	TQ 02235 04937	7	Arun Valley	140m east
Wigeon	12.11.2020	TQ 02235 04937	78	Arun Valley	140m east
Wigeon	17.12.2020	TQ 02235 04937	62	Arun Valley	140m east
Wigeon	19.01.2021	TQ 02235 04937	100	Arun Valley	140m east
Wigeon	02.02.2021	TQ 02235 04937	40	Arun Valley	140m east
Wigeon	17.12.2020	TQ19741821	16	Adur Valley	30m north-east
Shoveler	19.01.2021	TQ 19620 16853	15	Adur Valley	385m east
Teal	19.01.2021	TQ 19620 16853	82	Adur Valley	385m east
Teal	19.01.2021	TQ 19401 16418	1+	Adur Valley	400m east
Teal	19.01.2021	TQ 19829 18342	151	Adur Valley	Within the onshore part of the PEIR Assessment Boundary
Wigeon	19.01.2021	TQ 19829 18342	600	Adur Valley	Within the onshore part of the PEIR Assessment Boundary
Wigeon	02.02.2021	TQ1975 1813	90	Adur Valley	Within the onshore part of the PEIR Assessment Boundary
Teal	12.03.2021	TQ 19871 18132	90	Adur Valley	100m north-east
Wigeon	12.03.2021	TQ 19871 18132	122	Adur Valley	100m north-east

3.4.3 Target species records from the Arun Valley survey area identified a flock of wigeon that wintered on a small private pond by St Mary Magdalene's Church in Lyminster. The peak count was 100 individuals on 19 January 2021. All wigeon records from the Arun Valley survey area are from outside of (though within 500m of) the onshore part of the PEIR Assessment Boundary. The ponds at St Mary Magdalene's Church are 140m outside of the onshore part of the PEIR Assessment Boundary at the nearest point. There is also an access route option that passes at 100m distance, south from the ponds.

3.4.4 There were nine observations of target species from the Adur Valley survey area, four records of teal, four records of wigeon and a single record of shoveler. The results suggest that target species numbers in the Adur Valley peaked in January 2021 with a single day peak of 234 teal (combined counts), 15 shoveler and 600 wigeon.

3.4.5 Overall, there were three observations of target species within the onshore part of the PEIR Assessment Boundary during the winter bird surveys. Two records of wigeon and a single teal record. The wigeon records from within the onshore part of the PEIR Assessment Boundary were 600 birds foraging within flooded fields at TQ 19829 18342 on 19 January 2021, and 90 birds observed flying over the onshore part of the PEIR Assessment Boundary at TQ1975 1813 on 02 February 2021. The only record of teal within the onshore part of the PEIR Assessment Boundary was during the peak day count on 19 January 2021, where 151 birds were foraging with the wigeon flock at TQ 19829 18342.

3.4.6 The peak daily count of target species across both survey areas was on 19 January 2021 with a combined total of 234+ teal, 15 shoveler and 700 wigeon.

3.4.7 There were 24 secondary species recorded during the winter bird surveys including:

- three species listed on Annex I of the Birds Directive (Directive 2009/147/EC) (little egret, Mediterranean gull and Peregrine);
- four Wildlife and Countryside Act (WACA,1981) (as amended), Schedule 1 listed species (marsh harrier, Mediterranean gull, peregrine and red kite);
- three SPI (NERC, 2006) (herring gull, lapwing and white-fronted goose); and
- three species listed on BoCC (Eaton *et al*., 2015) Red list (herring gull, lapwing and white-fronted goose).

3.4.8 Three little egret records centred around the rivers with birds foraging along the Arun and Adur. The peak count was four individuals on 12 March 2021.

3.4.9 Mediterranean gull are listed on Annex I of the Birds Directive (EU) (Directive 2009/147/EC) and as Schedule 1 (Sch.1) listed species on the Wildlife and Countryside Act 1981 (as amended) (WACA, 1981) affording them heightened protection through the breeding season. There were two records of Mediterranean gull throughout the survey period, both records were of birds within the PEIR Assessment Boundary around the River Arun. The peak count was two individuals on 16 October 2020.

3.4.10 Peregrine are listed on Annex I of the Birds Directive (EU) (Directive 2009/147/EC) and Sch.1 listed on Wildlife and Countryside Act 1981 (as amended) (WACA, 1981). There were two observations of Peregrine during the winter bird surveys, both records were within the onshore part of the PEIR Assessment Boundary with a peak count of three individuals on 16 October 2020, where two adults and a juvenile bird were foraging together over the River Arun at Tortington.

3.4.11 There were two records of Marsh harrier during the winter bird surveys. Both records were of a lone female marsh harrier foraging over floodplains adjacent to the River Arun, on 17 December 2020 and 19 January 2021.

3.4.12 There were two records of red kite during the winter bird surveys. Both records were of birds foraging in the Adur Valley survey area, with a peak count of two birds on 12 November 2020.

3.4.13 There were six observations of lapwing during the winter bird surveys. Four records from the Arun Valley survey area and two from the Adur Valley. A peak count within the Arun Valley was 32 birds foraging in the fields by Tortington on 16 October 2020, further records from the Arun Valley include six, three and two individuals on 12 March 2021 displaying in the fields around the River, within the onshore part of the PEIR Assessment Boundary. The peak count for the Adur Valley (overall peak) was 51 birds foraging on 17 December 2020 within 500m of the onshore part of the PEIR Assessment Boundary, there was a record of 13 birds displaying on 12 March 2021, in fields adjacent to the River Adur.

3.4.14 There were three records of (greater) white-fronted goose within the winter bird surveys, all records were from the River Adur survey area and include repeat observations of the same flock. A peak count of 30 birds was recorded on 17 December 2020, in-keeping with a national influx at the time. There were two further observations of single birds, latterly associating with greylag and Canada goose flocks on 12 March 2021.

3.4.15 Herring gull were widespread within the survey areas in relative low numbers, the threshold for recording gulls accurately is flock sizes of 20+ birds, this count was achieved on a single occasion within the Arun Valley survey area on 19 January 2021, where 130 birds were foraging in flooded fields.

3.4.16 A full list of secondary species observed during the winter bird surveys is available in **Annex B**.

4. Glossary of terms and abbreviations

Term (Acronym)	Definition
BF	Beaufort
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EEC	European Economic Community
EU	European Union
GB	Great Britain
ha	hectare
ISS	Instantaneous Scan Samples
JNCC	Joint Nature Conservation Committee
km	kilometre
MAGIC	Multi-Agency Geographic Information for the Countryside
MW	megawatts
OS	Ordinance Survey
PEIR	Preliminary Environmental Information Report
PINS	The Planning Inspectorate
RSPB	Royal Society for the Protection of Birds

Term (Acronym)	Definition
SOS	Sussex Ornithological Society
SxBRC	Sussex Biodiversity Record Centre
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WACA	The Wildlife and Countryside Act 1981 (as amended)
WTG	Wind Turbine Generator

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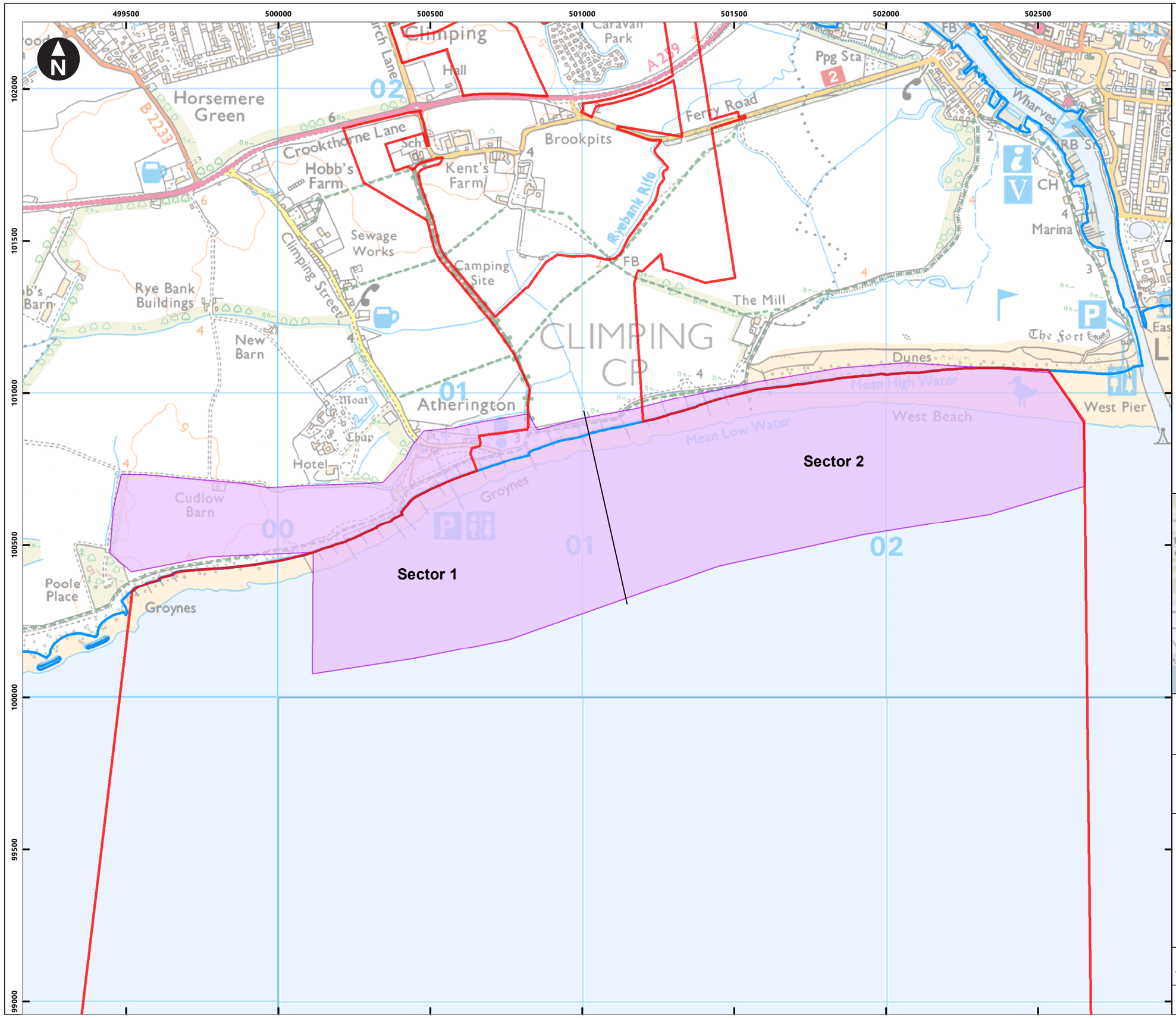
Annex A
Figures



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Key

- PEIR Assessment Boundary
- Intertidal Survey Area
- Mean High Water Springs

Kilometres
0 0.05 0.1 0.2 0.3 0.4

1:12,000

British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

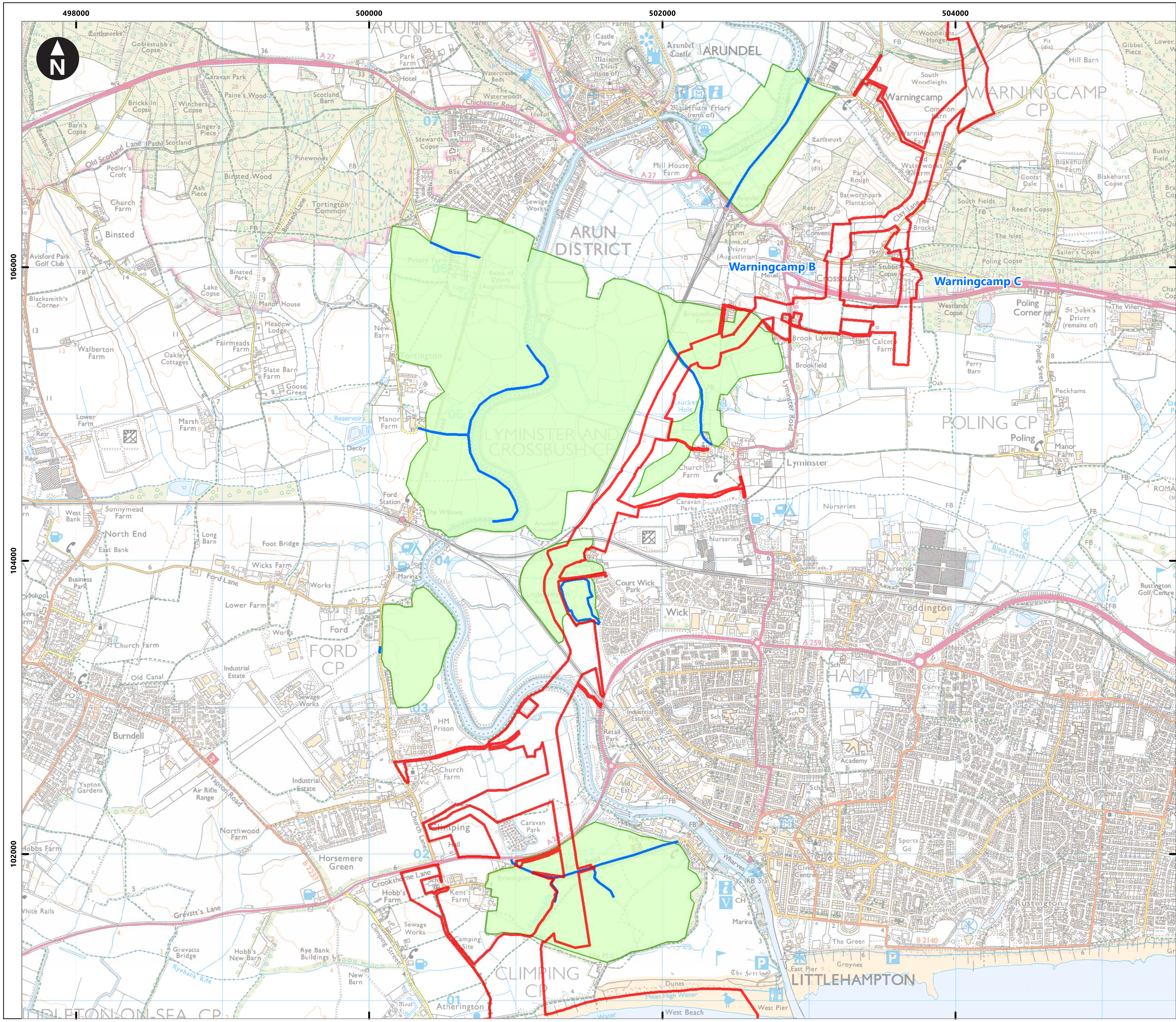
Rampion 2 Offshore Wind Farm

Figure 23.3.1 Ornithology Intertidal survey area 2020/21

Preliminary Environmental Information Report

System Identifier:	Version:
42285-WOOD-PE-CC-FG-O-8242	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WOOD	BARNB	BROOC	17/06/2021	Final



Key

- PEIR Assessment Boundary
- Winter Bird Survey Area
- Terrestrial Walkover Transect

Kilometres

0 0.125 0.25 0.5 0.75 1

1:25,000

British National Grid Transverse Mercator

Rampion Extension Development

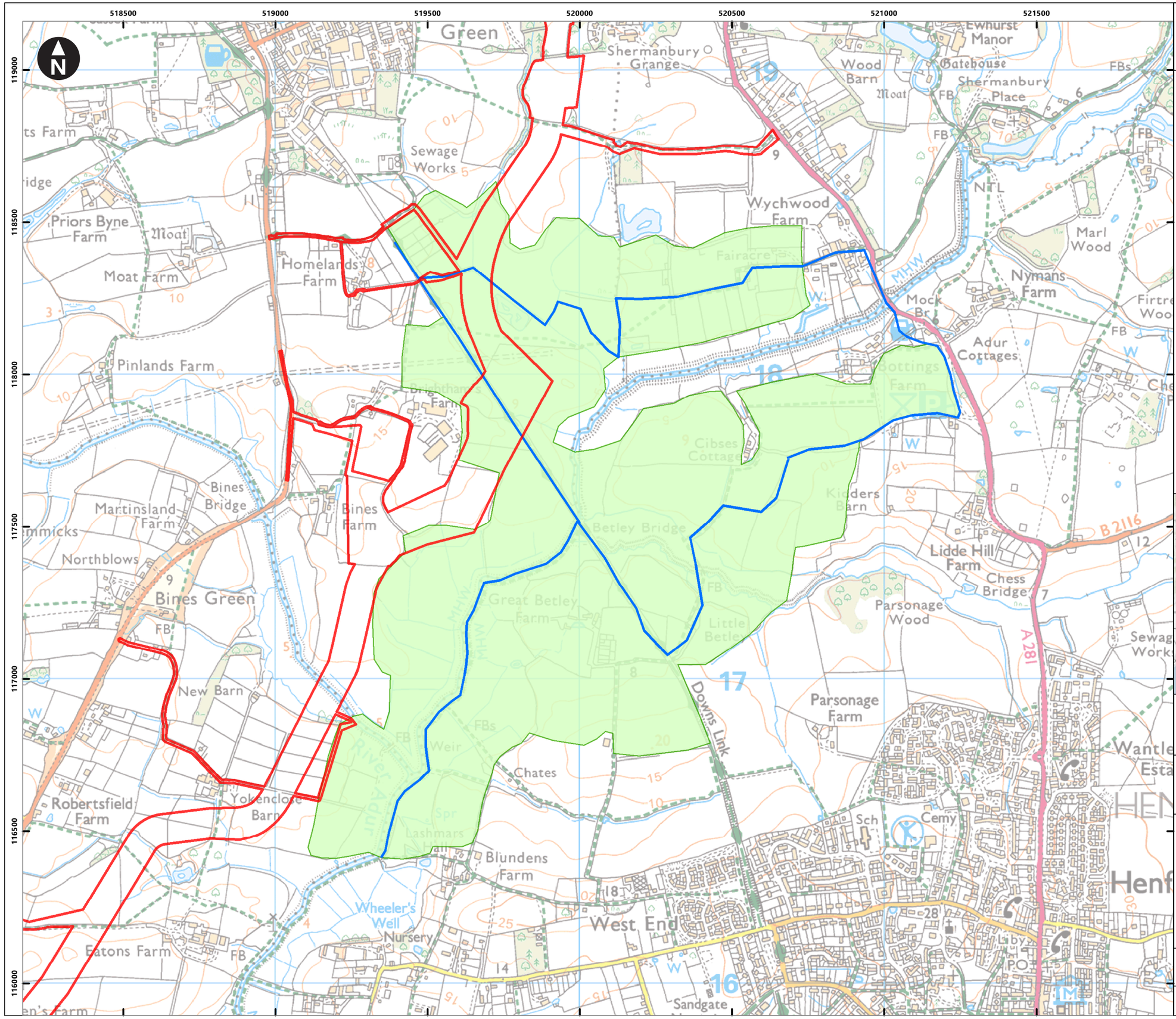
Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.3.2 Ornithology Winter bird survey area - Arun Valley

Preliminary Environmental Information Report

System Identifier: 42285-WOOD-PE-CC-FG-O-3015				Version: 1.0
Company: WOOD	Drawn By: BARNB	Chk/Aprvd: BROOC	Drawn Date: 17/06/2021	Status: Final



Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key

- PEIR Assessment Boundary
- Winter Bird Survey Area
- Terrestrial Walkover Transect

Rampion Extension Development

Rampion 2 WIND FARM

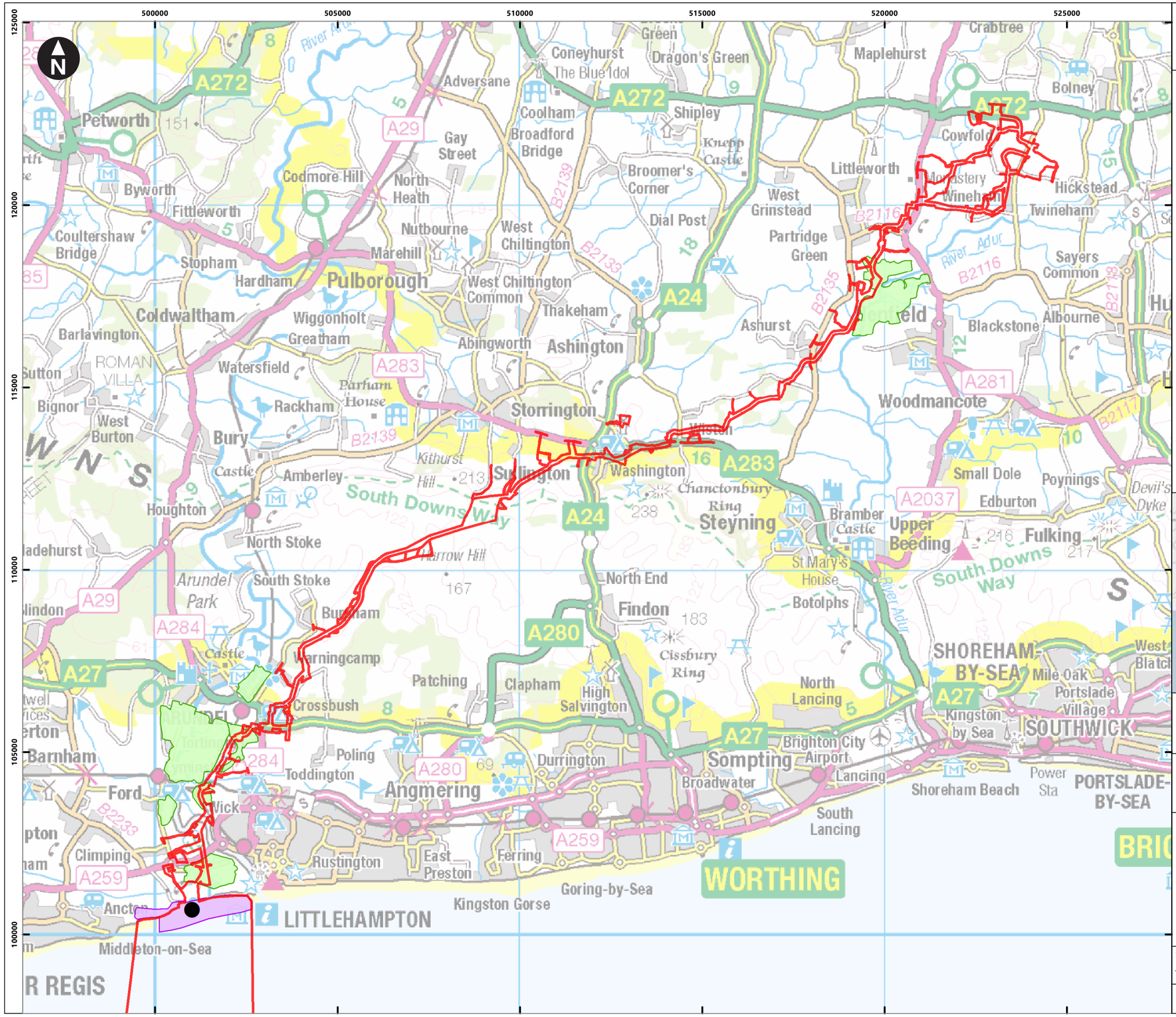
Rampion 2 Offshore Wind Farm

Figure 23.3.3 Ornithology Winter bird survey area - Adur Valley

Preliminary Environmental Information Report

System Identifier:	Version:
42285-WOOD-PE-CC-FG-O-8094	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WOOD	BARNB	BROOC	17/06/2021	Final



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Key

- PEIR Assessment Boundary

Pintail Species Count:

- 35
- Winter bird Survey Area
- Intertidal Survey Area

Kilometres

0 0.5 1 2 3 4

1:100,000

British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.3.4 Cumulative counts of Pintail recorded during all ornithology surveys winter 2020/21

Preliminary Environmental Information Report

System Identifier:	Version:
42285-WOOD-PE-CC-FG-O-4511	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WOOD	BARNB	BROOC	17/06/2021	Final

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Key

- PEIR Assessment Boundary
- Shoveler Species Count:
  - 15
- Winter bird Survey Area
- Intertidal Survey Area

Kilometres

0 0.5 1 2 3 4

1:100,000

British National Grid Transverse Mercator

Rampion Extension Development

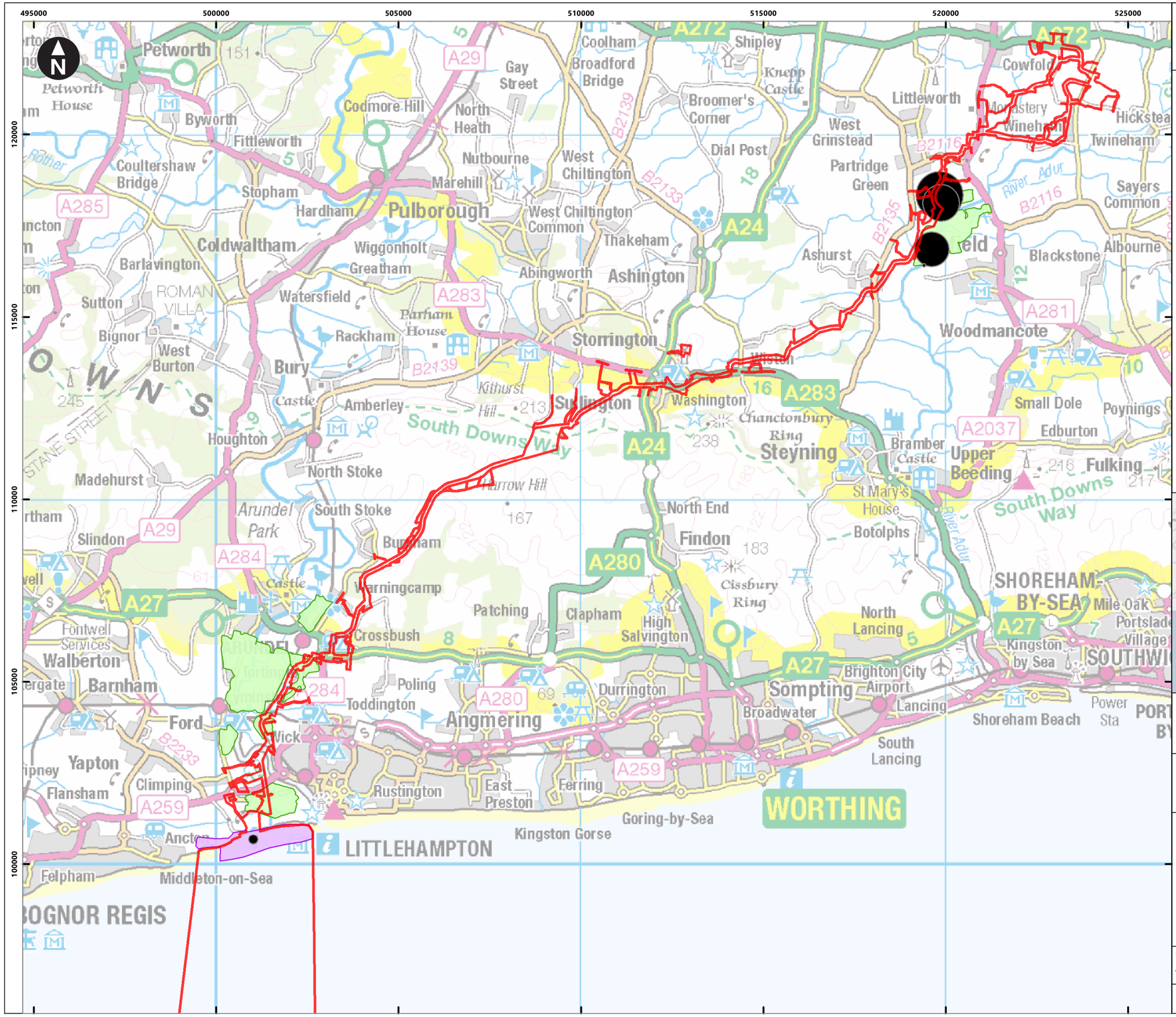
Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.3.5 Cumulative counts of Shoveler recorded during all ornithology surveys winter 2020/21

System Identifier:	Version:
42285-WOOD-PE-CC-FG-O-5170	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WOOD	BARNB	BROOC	17/06/2021	Final



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Key

- PEIR Assessment Boundary

Teal Species Count:

- 1
- 10
- 50
- 100

- Winter bird Survey Area
- Intertidal Survey Area

Kilometres

0 0.5 1 2 3 4

1:100,000

British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

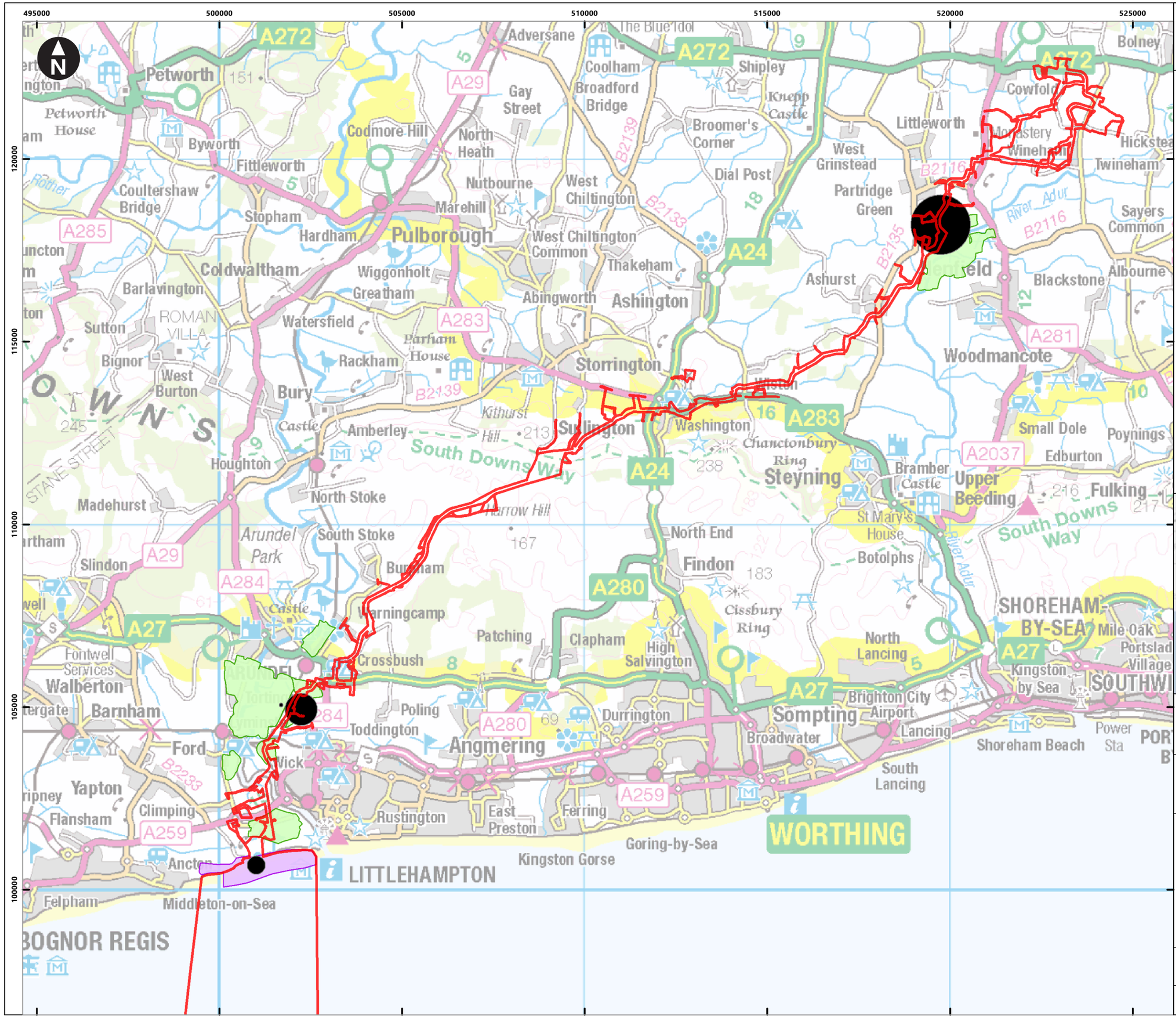
Rampion 2 Offshore Wind Farm

Figure 23.3.6 Cumulative counts of Teal recorded during all ornithology surveys winter 2020/21

Preliminary Environmental Information Report

System Identifier:	Version:
42285-WOOD-PE-CC-FG-O-9652	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WOOD	BARNB	BROOC	17/06/2021	Final



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Key

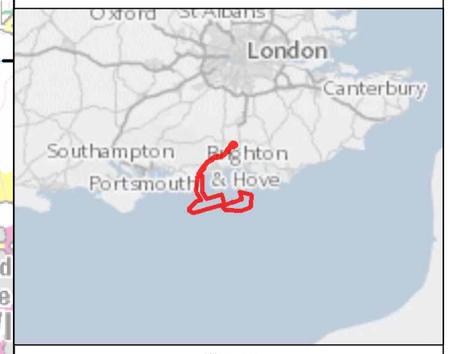
PEIR Assessment Boundary

Wigeon Species Count:

- 10
- 100
- 500
- 1,000

Winter bird Survey Area

Intertidal Survey Area



Kilometres

0 0.5 1 2 3 4

1:100,000

British National Grid Transverse Mercator

Rampion Extension Development

Rampion 2 WIND FARM

Rampion 2 Offshore Wind Farm

Figure 23.3.7 Cumulative counts of Wigeon recorded during all ornithology surveys winter 2020/21

Preliminary Environmental Information Report

System Identifier:	Version:
42285-WOOD-PE-CC-FG-O-6147	1.0

Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
WOOD	COLLJ	BROOC	17/06/2021	Final

Annex B
Secondary species records

Table B-1 below lists all species recorded during the intertidal surveys September 2020 to March 2021 inclusive.

Table B-1 Species recorded during the intertidal surveys September 2020 to March 2021

Species	Scientific name
Black-headed gull	*Chroicocephalus ridibundus*
Black redstart	*Phoenicurus ochruros*
Cormorant	*Phalacrocorax carbo*
Common gull	*Larus canus*
Common scoter	*Melanitta nigra*
Dark-bellied brent goose	*Branta bernicla*
Dunlin	*Calidris alpina*
Gannet	*Morus bassanus*
Great black-backed gull	*Larus marinus*
Great crested grebe	*Podiceps cristatus*
Great northern diver	*Gavia immer*
Grey heron	*Ardea cinerea*
Grey plover	*Pluvialis squatarola*
Guillemot	*Uria aalge*
Herring gull	*Larus argentatus*
Kingfisher	*Alcedo atthis*
Knot	*Calidris canutus*
Lapwing	*Vanellus vanellus*
Lesser black-backed gull	*Larus fuscus*
Little egret	*Egretta garzetta*

Species	Scientific name
Little gull	*Hydrocoloeus minutus*
Mute swan	*Cygnus olor*
Mediterranean gull	*Ichthyaetus melanocephalus*
Oystercatcher	*Haematopus ostralegus*
Pintail	*Anas acuta*
Purple sandpiper	*Calidris maritima*
Red-throated diver	*Gavia stellata*
Red-breasted merganser	*Mergus serrator*
Ringed plover	*Charadrius hiaticula*
Snipe	*Gallinago gallinago*
Sanderling	*Calidris alba*
Sandwich tern	*Thalasseus sandvicensis*
Shelduck	*Tadorna tadorna*
Slavonian grebe	*Podiceps auritus*
Teal	*Anas crecca*
Turnstone	*Arenaria interpres*
Wigeon	*Mareca penelope*

Table B-2 below lists all secondary species recorded during the winter bird surveys September 2020 to March 2021 inclusive.

Table B-2 Species recorded during the winter bird surveys September 2020 to March 2021

Species	Scientific name
Blackbird	*Turdus merula*
Black-headed gull	*Chroicocephalus ridibundus*
Blue tit	*Cyanistes caeruleus*
Bullfinch	*Pyrrhula pyrrhula*

Species	Scientific name
Buzzard	*Buteo buteo*
Canada goose	*Branta candensis*
Chaffinch	*Fringilla coelebs*
Common gull	*Larus canus*
Common sandpiper	*Actitis hypoleucos*
Coal tit	*Periparus ater*
Collared dove	*Streptopelia decaocto*
Coot	*Fulica atra*
Cormorant	*Phalacrocorax carbo*
Corn bunting	*Emberiza calandra*
Dunnock	*Prunella modularis*
Egyptian goose	*Alopochen aegyptiaca*
Fieldfare	*Turdus pilaris*
Firecrest	*Regulus ignicapilla*
Gadwall	*Mareca strepera*
Goldcrest	*Regulus regulus*
Goldfinch	*Carduelis carduelis*
Great tit	*Parus major*
Grey heron	*Ardea cinerea*
Grey wagtail	*Motacilla cinerea*
Greylag goose	*Anser anser*
Herring gull	*Larus argentatus*
House sparrow	*Passer domesticus*
Kestrel	*Falco tinnunculus*
Lapwing	*Vanellus vanellus*
Lesser black-backed gull	*Larus fuscus*

Species	Scientific name
Lesser redpoll	*Acanthis cabaret*
Linnet	*Linaria cannabina*
Little egret	*Egretta garzetta*
Little grebe	*Tachybaptus ruficollis*
Long-tailed tit	*Aegithalos caudatus*
Mallard	*Anas platyrhynchos*
Marsh harrier	*Circus aeruginosus*
Marsh tit	*Poecile palustris*
Meadow pipit	*Anthus pratensis*
Mediterranean gull	*Ichthyaetus melanocephalus*
Mistle thrush	*Turdus viscivorus*
Moorhen	*Gallinula chloropus*
Mute swan	*Cygnus olor*
Peregrine	*Falco peregrinus*
Red kite	*Milvus milvus*
Redshank	*Tringa totanus*
Redwing	*Turdus iliacus*
Reed bunting	*Emberiza schoeniclus*
Shoveler	*Spatula clypeata*
Siskin	*Spinus spinus*
Skylark	*Alauda arvensis*
Snipe	*Gallinago gallinago*
Song thrush	*Turdus philomelos*
Sparrowhawk	*Accipiter nisus*
Starling	*Sturnus vulgaris*
Stock dove	*Columba oenas*

Species	Scientific name
Teal	*Anas crecca*
Tufted duck	*Aythya fuligula*
Water rail	*Rallus aquaticus*
White-fronted goose	*Anser albifrons*
Wigeon	*Mareca penelope*
Woodpigeon	*Columba palumbus*
Yellowhammer	*Emberiza citrinella*

Annex C
Full survey details

Full survey details of the intertidal surveys and winter bird surveys are shown below in **Table C-1** and **Table C-2**.

Table C-1 Full survey details of intertidal surveys undertaken September 2020-March 2021 inclusive

Date	Tidal state	Start time	End time	Weather conditions
24/09/2020	LT -+3	07:48	13:48	Dry, 8/8 Oktas cloud, wind Beaufort (BF) 6 south-westerly, visibility >3km, temperature 12°C
02/10/2020	HT -+3	09:33	15:33	Rain showers heavy at times, 8/8 to 5/8 Oktas cloud, wind BF8 easterly clearing to BF5, visibility > 3km, temperature 14°C
05/10/2020	HT -+3	10:50	16:50	Dry, 4/8 Oktas cloud, wind BF1 westerly, visibility > 3km, temperature 14°C.
26/10/2020	LT -+3	10:41	16:41	Dry, 2/8 Oktas cloud, wind BF4 westerly, visibility >3km, temperature 12°C
03/11/2020	HT -+3	09:17	15:17	Dry, 3/8 Oktas cloud, wind BF3 south-westerly, visibility >3km, temperature 9°C
25/11/2020	LT -+3	09:27	15:27	Light rain, 8/8 Oktas cloud, wind BF3 south-westerly, visibility >3km, temperature 13°C
03/12/2020	HT -+3	09:36	15:36	Light rain, 8/8 Oktas cloud, wind BF3 south-westerly, visibility > 3km, temperature 8°C
09/12/2020	LT -+3	08:28	14:28	Dry, 6/8 Oktas cloud, wind BF1 north-westerly, visibility >3km, temperature 3°C
08/01/2021	LT -+3	09:04	15:04	Dry, 3/8 Oktas cloud, wind BF1 easterly, visibility >3km, temperature 1°C
13/01/2021	HT -+3	08:11	14:11	Intermittent showers, 8/8 Oktas cloud, wind BF1 south-westerly, visibility 1-3km, temperature 7°C
12/02/2021	HT -+3	08:57	14:57	Dry, 4/8 Oktas cloud, wind BF7 easterly, visibility >3km, temperature -2°C

Date	Tidal state	Start time	End time	Weather conditions
22/02/2021	LT -+3	10:04	16:04	Light showers, 8/8 Oktas cloud, wind BF1 south-westerly turning west, visibility 1-3km (Sea-fog), temperature 8°C
08/03/2021	LT -+3	10:03	16:03	Dry, 3/8 Oktas cloud, wind BF3 south-westerly, visibility >3km, temperature
15/03/2021	HT -+3	09:34	15:34	Dry, 6/8 Oktas cloud, wind BF4 north-westerly, visibility > 3km, temperature 12°C

Table C-2 Full survey details of winter bird surveys undertaken September 2020-March =2021 inclusive

Date	Survey Area	Start time	End time	Weather conditions
28/09/2020	Arun Valley	10:00	13:30	Dry, 2/8 Oktas cloud, BF1 northerly, visibility > 3km, temperature 14°C
28/09/2020	Adur Valley	10:00	13:30	Dry, 3/8 Oktas cloud, BF1 northerly, visibility > 3km, temperature 14°C
16/10/2020	Arun Valley	09:00	11:30	Dry, 1/8 Oktas cloud, BF1 north-easterly, visibility > 3km, temperature 8°C
16/10/2020	Adur Valley	09:00	11:30	Dry, 2/8 Oktas cloud, BF2 north-easterly, visibility > 3km, temperature 10°C
12/11/2020	Arun Valley	09:15	11:45	Dry, 1/8 Oktas cloud, BF1 south-westerly, visibility > 3km, temperature 12°C
12/11/2020	Adur Valley	09:15	11:45	Dry, 3/8 Oktas cloud, BF1 south-westerly, visibility > 3km, temperature 12°C
17/12/2020	Arun Valley	09:30	12:00	Dry, 3/8 Oktas clous, BF2 south-westerly, visibility > 3km, temperature 8°C
17/12/2020	Adur Valley	09:30	12:00	Dry, 3/8 Oktas clous, BF2 south-westerly, visibility > 3km, temperature 8°C
19/01/2021	Arun Valley	09:40	12:10	Heavy showers, 8/8 Oktas cloud, BF4 westerly, visibility >3km, temperature 8°C
19/01/2021	Adur Valley	09:40	12:10	Heavy showers, 8/8 Oktas cloud, BF4 westerly, visibility >3km, temperature 8°C
02/02/2021	Arun Valley	09:30	11:30	Light showers, 6/8 Oktas cloud, wind BF3 south-west, visibility >3km, temperature 11°C
02/02/2021	Adur Valley	09:30	11:30	Light showers, 6/8 Oktas cloud, wind BF3 south-west, visibility >3km, temperature 11°C
12/03/2021	Arun Valley	09:30	12:15	Light showers, 6/8 Oktas cloud, wind BF4 south-west, visibility >3km, temperature 9°C
12/03/2021	Adur Valley	09:30	12:15	Light showers, 6/8 Oktas cloud, wind BF4 south-west, visibility >3km, temperature 9°C