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Appendix 6.C – Report on Surveys of Wintering Birds

NeuConnect: Great Britain to Germany Interconnector

GB Onshore Scheme

Environmental Statement

Appendix 6C – Report on Surveys for Wintering Birds

NeuConnect Britain Ltd

September 2019

Quality information

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1. Introduction

1.1 AECOM was instructed by NeuConnect Britain Limited (the 'Applicant') to undertake a survey of wintering birds for the terrestrial area (i.e. non-estuarine) for the Neuconnect project (the 'Proposed Development') at Grain, Isle of Grain. The Preliminary Ecological Appraisal (PEA)[1], undertaken in 2018, identified that the habitat within the Proposed Development area was suitable to support wintering birds and that further surveys were required to determine the presence / absence of notable species and the assemblage of non-breeding (wintering) bird species.

Proposed Development

1.2 NeuConnect (the 'Project'), is a 1400 megawatt (MW) interconnector between Great Britain and Germany. The Project will create the first direct electricity link between Great Britain and German energy networks. The new link will create a connection for electricity to be passed in either direction between Great Britain and Germany. The Project will be formed by approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HDVC) cables, with on-shore converter stations linking into the existing electricity grids in Great Britain and Germany.

1.3 The Proposed Development will comprise of three structures, a Converter Station, Sub-station and a Direct Current (DC) cable route (see Figure 1).

1.4 The footprint of the proposed converter station is expected to be up to approximately 250 metres (m) by 250 m (to the perimeter security fence), with a maximum height of up to 26 m.

1.5 The footprint of the proposed substation is expected to be approximately 80 m by 80 m (to the perimeter security fence), with a maximum height of 14 m.

1.6 The proposed DC cable corridor will be approximately 1.6 km long (from landfall to the converter station). The preferred installation method will be underground, which will result in a temporary loss of land during installation. The working corridor for the installation of the cable corridor will be 30 m.

1.7 Additional laydown areas will be required for construction, comprising 1.5 hectare (ha) for the converter laydown and 0.3 ha for the substation laydown.

Site description

1.8 The Proposed Development areas (the 'Site') is entirely within the boundary of Medway Council and is centred on the Isle of Grain located at the tip of the Hoo Peninsula between the Thames Estuary to the north and the Medway Estuary to the south. The Site is located to the west of the village of Grain, Isle of Grain, Kent at Ordnance Survey (OS) central grid reference TQ 88205 76727. Land use comprises a mix of industrial development to the south, the small settlement of Grain to the southeast and undeveloped land, much of which is designated for ecological interests, to the north (along the coastline) and to the west. Land within the Site and in the immediate vicinity has historically been used for the extraction of gravel and sand and the resultant voids used for landfill.

1.9 Figure 1 shows the Site boundary (red-line), the cable corridor (purple line) and proposed location of each structure.

[1] AECOM, Neuconnect, Isle of Grain: Preliminary Ecological Appraisal Report, 2019.

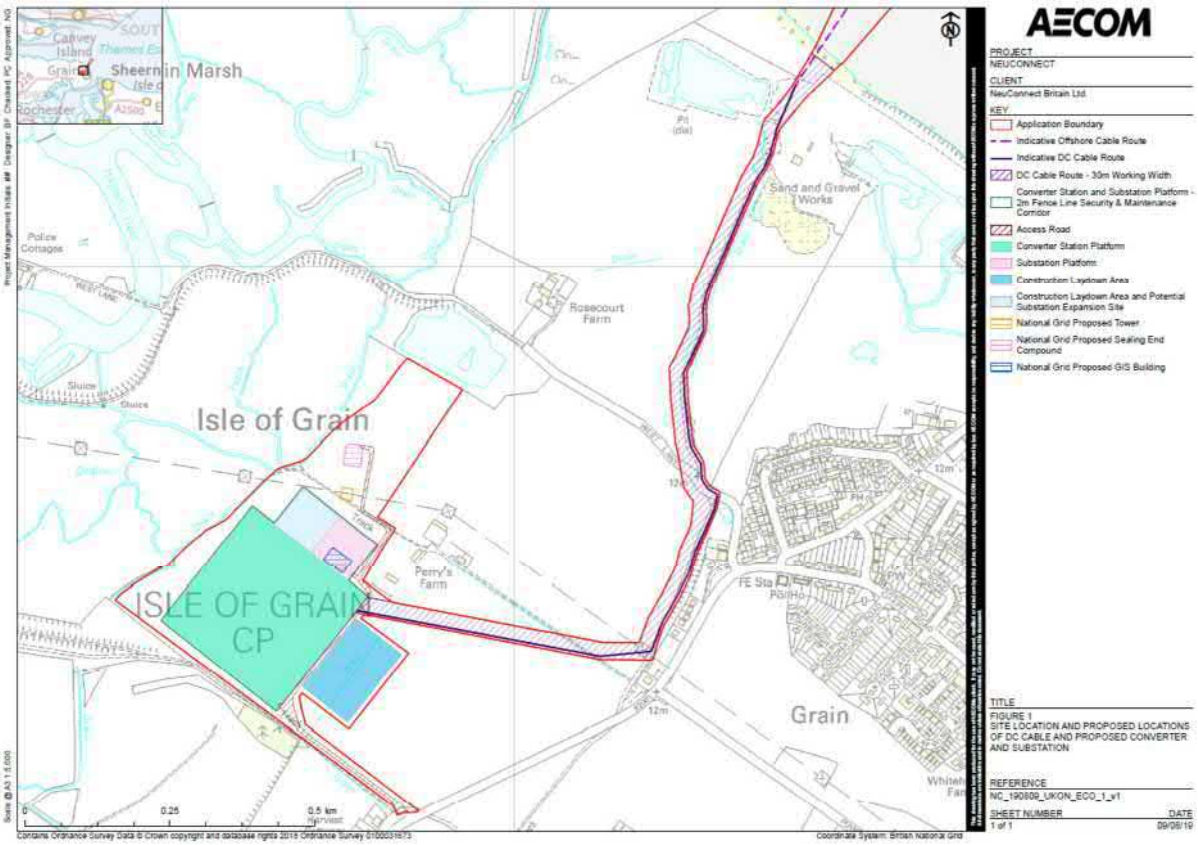

Figure 1 - Site boundary and proposed locations of DC cable route, converter station and substation

Survey Area

1.10 The survey area included all terrestrial (i.e. non-estuarine) habitats within the Site boundary and a 100 metre (m) buffer.

Scope of report

1.11 The objective of the wintering bird survey was to determine the presence and assemblage of wintering bird species, including notable species, within the Site boundary to determine the potential impacts of the Project on wintering birds.

2. Assessment Criteria

Legislation

2.1 The legislative provisions for the protection of wild birds in the UK are contained primarily in Section 1-7 of the Wildlife and Countryside Act (WCA) 1981 (as amended)[2]. Under the WCA, a wild bird is defined as any bird of a species that occurs in a wild state as a resident or a visitor to the European Territory of any member state.

2.2 Reference is not made in this report to species afforded special protection under Schedule 1 of the Wildlife and Countryside Act as the protection measures in this Act only apply to bird species within the breeding season.

2.3 However, a number of bird species recorded within the UK (including those that are resident, overwintering and migratory) are protected under European legislation under The Directive of the Conservation of Wild Birds[3], which lists 194 species, or sub-species, of birds in Annex 1 which are:

- in danger of extinction;
- are rare, or have restricted local distribution;
- are vulnerable to specific changes in their habitat; or
- require particular attention for reasons of the specific nature of habitat.

2.4 These species are afforded enhanced legal protection and EU member states have a responsibility to maintain the populations of these species at a level that corresponds to their ecological, scientific and cultural requirements (Article 2). This Directive is transposed into English law through The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018[4].

2.5 Species listed on Annex 1 of the Birds Directive are those for which the UK Government are also required to take special measures, including the designation of Special Protection Areas, to ensure the survival and reproduction of these species throughout their area of distribution.

2.6 The Natural Environment and Rural Communities (NERC) list of Species of Principal Importance[5] is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006; under Section 40 every public authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity (the biodiversity duty).

National and Local Planning Policy

2.7 The National Planning Policy Framework (NPPF)[6] was originally published on 27th March 2012 and detailed the Government's planning policies for England and how these are expected to be applied. The NPPF was then revised on 24th July 2018 and 19th February 2019. The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

2.8 It specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this is to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for

[2] HMSO, The Wildlife & Countryside Act 1981, 1981.
[3] EUROPEAN COMMISSION, The Directive of the Conservation of Wild Birds, 1979.
[4] HMSO, Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018.
[5] HMSO, Natural Environment and Rural Communities (NERC) Act 2006.
[6] HMSO, National Planning Policy Framework, 2018

particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

2.9 The NPPF is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

2.10 Further information on the NPPF and local planning policy relevant to nature conservation is provided in detail in the Preliminary Ecological Appraisal for the Proposed Development (AECOM, 2019)1.

Priority Species

2.11 Species of principal importance for the conservation of biodiversity in England are listed under Section 41 of the NERC Act 2006. This list is used to guide decision-makers in public bodies, in implementing their biodiversity duty. There are 49 species of bird listed as priorities for nature conservation action and therefore for consideration in ecological impact assessment.

2.12 The Joint Nature Conservation Committee (JNCC) UK Biodiversity Action Plan (UKBAP)[7] was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority habitats and species of conservation concern were published and, in July 2012 were subsequently succeeded by the UK Post-2010 Biodiversity Framework[8]. The UK list of priority species and habitats, however, remains an important reference source and has been used to help draw up statutory lists of priority habitats and species in England, Scotland, Wales and Northern Ireland. For the purpose of this assessment, the UK BAP is still used as one of the criteria to assist in assigning national value to an ecological receptor.

2.13 The Kent Biodiversity Action Plan 1997[9] sets out action plans within the county, including one bird species, Nightingale Luscinia megarhynchos.

2.14 The Kent Red Data Book[10] (KRDB) provides information on Kent's rarest and most threatened flora and fauna. Of the 62 bird species listed, 58 are included for their breeding populations with two of these (Avocet *Recurvirostra avosetta* and Black-tailed Godwit *Limosa limosa*) also qualifying for their winter populations. Four other species (Red-throated Diver *Gavia stellata*, White-fronted Goose *Anser albifrons*, Pintail *Anas acuta* and Knot *Calidris canutus*) are included for their winter populations alone. For winter bird populations to qualify, Kent needs to hold >20% of the British population and >4% of the relevant international population (Western Europe or East Atlantic flyway). These species are labelled as KRDB3 in the Kent Red Data Book.

Birds of Conservation Concern

2.15 Species listed on the Birds of Conservation Concern (BoCC): Red List (Eaton et. al, 2015)[11] are those that have declined in numbers by 50% over the last 25 years, those that have shown an historical population decline between 1800 and 1995 and species that are of global conservation concern. There are 67 species on the Red List that are of the most urgent conservation concern.

2.16 Species listed on the BoCC: Amber List (Eaton et. al, 2015), of which there are currently 96, include those that have shown a moderate decline in numbers (25%-49%) over the last 25 years and those with total populations of less than 300 breeding pairs. Also included are those species which represent a significant proportion (greater than 20%) of the European breeding or wintering population, those for which at least 50% of the British population is limited to 10 sites or less, and those of unfavourable conservation status in Europe.

[7] JNCC, UK Biodiversity Action Plan (UKBAP), 1994, available at http://jncc.defra.gov.uk/page-5155, accessed April 2019.
[8] JNCC, UK Post-2010 Biodiversity Framework, 2012, available at http://jncc.defra.gov.uk/page-6189, accessed April 2019.
[9] Kent Biodiversity Action Plan Steering Group, The Kent Biodiversity Action Plan, 1997.
[10] Waite, A., 1999. Kent Red Data Book. Kent Wildlife Trust.
[11] Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R., Birds of Conservation Concern 4. The population status of birds in the United Kingdom, Channel Islands and Isle of Man, 2015.

2.17 The remaining species, not included on the Red or Amber lists, are placed on the Green List, indicating that they are of low conservation priority.

3. Methods

Desk Study

3.1 A desk study was undertaken in July 2018 through Kent & Medway Biological Records Centre (KMBRC), to obtain records of protected / notable bird species within a 2 km radius of the Proposed Development and from within the last ten years of the request date.

Field Survey

3.2 The wintering bird survey was undertaken based on a transect methodology as detailed in Bibby et al. (2000)[12] and Gilbert et al. (1998)[13].

3.3 A transect route was selected to include the whole survey area including walking all field boundaries within and, where possible, the adjacent 50 m. The whole survey area was covered on each of the six survey visits, using suitable optical equipment to observe bird behaviour. Survey routes were mapped and the direction walked alternated on each visit, to ensure that all areas were covered at various times of day across the duration of the survey. Surveys were undertaken during a range of daylight hours, between sunrise and sunset.

3.4 On each visit, the route was walked at a slow pace with start and finish times noted. All birds seen and heard were recorded directly onto paper maps of the survey area or onto an ArcGIS base map using ESRI software on hand-held PDA devices, with a 1:10,000 scale Ordnance Survey base map of the survey area. A fresh map was used for each survey. Registrations of birds were recorded using standard British Trust for Ornithology (BTO) two letter species codes.

3.5 All bird species were recorded and mapped across the whole survey area.

3.6 Six surveys for wintering birds were undertaken between February / March 2018 and October 2018 and January 2019 (Table 3.1). Each survey was undertaken during appropriate weather conditions and avoided, where possible, days with adverse weather conditions such as heavy rain or strong winds as birds may be harder to detect in such conditions.

3.7 The survey visits and weather conditions are shown below in Table 3.1.

Table 1 – Wintering Bird Survey: Survey Dates and Weather Conditions

Survey Number	Date	Weather Conditions
1	21/02/2018	6°C, cloud 8/8, wind F3 NW
2	13/03/2018	7°C, cloud 8/8, wind F2 W
3	19/10/2018	12°C, cloud 1/8, wind F2 N
4	19/11/2018	7°C, cloud 6/8, wind F5 NW
5	11/12/2018	7°C, cloud 2/8, wind F2 SE
6	16/01/2019	8°C, cloud 8/8, wind F4 SW

Notes on Table 3.1: Wind speed is shown using the Beaufort scale, which is an empirical measure of force (F)

0-12 that relates wind speed to observed conditions. Cloud cover is shown in a scale of 0-8 where the number represents the amount of cloud cover e.g. 2/8 is 25% cover 4/8 is 50% etc.

[12] Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H., Bird Census Techniques: 2nd edition, 2000.
[13] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods: A manual of techniques for key species. RSPB/BTO/JNCC/WWT/ITE/The Seabird Group. RSPB/BTO, Sandy, Beds.

Assessment of Ornithological Importance

3.8 To support a focussed assessment of the population of wintering birds within the Site, their biodiversity value has been defined with reference to the geographical level at which it matters. The frames of reference used in this report are made using the values presented in the Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the United Kingdom: Terrestrial, Freshwater and Marine (CIEEM 2018)[14].

3.9 The evaluation uses a framework, linked to a geographical scale at which the receptor has been valued (i.e. international, national, regional, county, local or site) and this method represents best practice guidance. This assessment criteria, set out in Table 3.2, has been used to assess the biodiversity value of the wintering bird populations recorded during the field surveys.

Table 2 - Importance of Ornithological Features

Importance of Ornithological Features	Descriptors and Examples of Criteria
International or European	An internationally designated site or candidate site including Special Protection Area (SPA), potential SPAs (pSPAs)[1]; and Ramsar sites (wetlands of international importance). Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Resident or regularly occurring populations of species which may be considered at an international or European level[2] where: - the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; - the population forms a critical part[3] of a wider population at this scale; or - the species is at a critical phase[4] of its life cycle at this scale.
UK or National	Sites designated at UK or national level e.g. Site of Special Scientific Interest (SSSI). Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Areas of key or priority species identified in the UK Post-2010 Biodiversity Framework *i.e.* UK Biodiversity Action Plan (BAP), including those published in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principal importance for the conservation of biodiversity. Resident or regularly occurring populations of species which may be considered at a UK or a national level[5] where: - the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; - the population forms a critical part of a wider population at this scale; or - the species is at a critical phase of its life cycle at this scale.
Regional	Populations of species of value at a regional level (*i.e.* South East England). Resident or regularly occurring populations of species which may be considered at a regional level where: - the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; - the population forms a critical part of a wider population at this scale; or - the species is at a critical phase of its life cycle at this scale.
County or Unitary Authority or District	Populations of species of value at a County (*i.e.* Kent) level or District (*i.e.* Medway). Designated sites, such as County Wildlife Site (CWS), Local Wildlife Site (LWS) or Sites of Importance for Nature Conservation (SINC) and Local Nature Reserve (LNR) designated in the county or unitary authority area i.e. District context.

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Importance of Ornithological Features	Descriptors and Examples of Criteria
	Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Areas of key or priority habitats identified in the Local Biodiversity Action Plan (LBAP). Resident or regularly occurring populations of species which may be considered at a County (or District) level[6] where: - the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; - the population forms a critical part of a wider population at this scale; or, - the species is at a critical phase of its life cycle at this scale.
Local	Species populations of value in a local (*i.e.* within ~ 5 km of the site) context. Designated sites include LNRs designated in the local context. Populations and, or communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of value for migration, dispersal or genetic exchange.
Site	Habitats and associated species that is of value in the context of the site only. Populations of common and widespread species.

* As well as assigning importance there is also a need to identify all legally protected species that could be affected by the Proposed Development in order that measures can be taken to ensure that adherence to the relevant legislation is observed. This may include the adoption of mitigation and appropriate licensing which are acceptable to Natural England.

CIEEM, Guidelines for Ecological Impact Assessment in the United Kingdom: Terrestrial, Freshwater, 2018.

2 pSACs are sites which UK Government has been formally advised of but have not yet been submitted to the European Commission. These sites should be valued at an international (European) level on the basis that they meet the relevant selection criteria for a SAC but are not yet designated as such.

3 Such species include those listed within the Directive 2009/147/EC on the Conservation of Wild Birds (i.e. EC Birds Directive) (codified version of Council Directive 79/409/EEC as amended) or animal or plant species listed within Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (i.e. Habitats Directive).

4 Such populations include sub-populations that are essential to maintenance of metapopulation dynamics, e.g. critical emigration and, or immigration links between otherwise discrete populations.

5 Seasonal activity or behaviour upon which survival or reproduction depends.

6 Species which may be considered at the UK or national level mean: birds, other animals and plants which receive legal protection on the basis of their conservation interest (those listed within the Wildlife and Countryside Act 1981 (as amended) Schedule 1, 5 and 8); species listed for their principal importance for biodiversity (in accordance with the Natural Environment and Communities Act 2006 Section 41 England), priority species listed within the UK Post 2010 Biodiversity Framework (i.e. UK Biodiversity Action Plan (UKBAP)), or species listed within the Red Data Book.

Species Rarity Assessment

3.10 The assessment of the ornithological importance of the Site during the non-breeding (winter) season was made by evaluating any species afforded special statutory protection or those included on one, or more, of the lists of species of conservation interest (as detailed in Section 2 of this report). These are:

- species listed on Annex 1 of the EU Birds Directive;
- UK Biodiversity Action Plan (BAP) priority bird species;

- NERC Species of Principal Importance;
- Kent Biodiversity Action Plan species;
- Kent Red Data Book species;
- species included in the Birds of Conservation Concern (BoCC) Red and Amber Lists (Eaton et al., 2015); and
- those occurring within the survey area in nationally, regionally or locally important numbers.

Species Abundance Assessment

3.11 In addition to evaluating a site based on its populations of wintering birds in relation to legal status, rarity and conservation value, consideration has to be given to the value of the Site for the population of individual species that it supports. This can be done by comparing the population present within the study area with the national and county wintering population for certain species. National estimates for non-breeding birds are published in 'Population Estimates of Birds in Great Britain and the United Kingdom' (Musgrove et al. 2013)[15]. The British Trust for Ornithology (BTO) Bird Atlas 2007-2011 (Balmer et. al. 2013)[16] was also reviewed for species information on a national level.

3.12 Current county-level estimates on the wintering bird populations of the majority of species in Kent, e.g in a county avifauna, are not available. Kent Ornithological Society produces an annual county bird report, with the most recent publication reporting on birds recorded in 2014. However, population estimates for the majority of non-breeding populations in the county are not presented in this report.

Species Diversity Assessment

3.13 Local Wildlife Sites (LWS) are among the most important places for wildlife in Kent, together with legally protected land such as Sites of Special Scientific Interest (SSSIs). An individual LWS can be considered for selection for birds in the county if it meets the criteria within the 'Local Wildlife Sites in Kent: Criteria for Selection and Delineation' (Kent Wildlife Trust, 2015)[17].

3.14 A site should be selected as a Local Wildlife Site if it can be considered as a single, identifiable unit in terms of its bird fauna and where:

- it is occupied regularly by at least 2.5% of the county population of any one or more bird species, based on the most recent and authoritative data; or
- it holds three or more Kent Red Data Book 3 (KRDB3) species at the appropriate time of year (normally this should not include a combination of breeding and wintering species); or
- it is occupied regularly by 5% or more of the county population of any one or more species in non-breeding seasons, based on the most recent and authoritative data; or
- it has been recorded as being regularly used in recent years by at least 60 wintering bird species; or
- It has been recorded as being regularly used in recent years by at least 100 passage bird species.

3.15 The LWS selection criteria for Kent, recognises:

- the rarity of certain wintering bird species;
- birds which may be considered vulnerable because their populations are in decline;

[15] Musgrove, A., Aebischer, N., Eaton, M., Hearn, R., Newson, S., Noble, D., Parsons, M., Risely, K. and Stroud, D., Population estimates of birds in Great Britain and the United Kingdom, 2013.
[16] Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I. and Fuller, R., Bird Atlas 2007-2011, 2013, available at https://www.bto.org/research-data-services/publications/bto-books-and-guides/2013/bird-atlas-2007-11-breeding-and, accessed January 2019.
[17] Kent Wildlife Trust, Criteria for Selection and Delineation, 2015.

- birds which may be considered vulnerable because their non-breeding populations are concentrated in a small number of sites; and
- sites of importance for the presence of a diversity of species.

Desk Study and Survey Limitations

3.16 The aim of a desk study is to help characterise the baseline context of a Proposed Development and provide valuable background information that would not be captured by a single site survey alone. Information obtained during the course of a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular species does not necessarily mean that species does not occur in the study area. Likewise, the presence of records for particular species does not automatically mean that these still occur within the area of interest or are relevant in the context of the Proposed Development.

3.17 Within this assessment, data have been collected during the latter period of winter 2017/2018 and early period of winter 2018/2019. A standard survey and analysis of non-breeding (wintering) birds over the winter period would encompass a survey programme within a single winter period but, due to the Proposed Development programme, the surveys commenced in February 2018. However, the weather in the winter period 2017/2018 was relatively settled and similar to that of 2018 / 2019, with no prolonged extreme weather periods that would influence the presence or abundance of wintering bird species on Site. Therefore, these data collected from a 'split' winter in a calendar, rather than biological year are representative of a typical winter period.

3.18 The majority of ecological data is valid only for short periods due to the inherently transient nature of the subject (CIEEM, 2019[18]). On this basis, it is recommended that the surveys for wintering birds will need repeating in two years (i.e. in 2020).

[18] CIEEM: Advice Note on the lifespan of ecological surveys and reports https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf (Accessed May 2019)

4. Results

Desk Study

4.1 The KMBRC returned records of 213 bird species from within 2 km of the Proposed Development area and within the last ten years. Of these 213 bird species, 131 are protected / notable.

4.2 A full list of all protected or notable bird species recorded during the data search is included in Appendix A.

Field Survey

4.3 A total of 43 species were recorded on the Site during the surveys of wintering birds between February and March 2018 and October 2018 to January 2019. A summary of these species, along with the peak and mean counts recorded, are presented in Table 4.1.

Table 3 - Peak and Mean Count Data of Birds Recorded on Site During the Wintering Bird Survey

Species (Common Name)	Scientific Name	Peak Count	Date of Peak Count	Mean Count
Mute Swan	*Cygnus olor*	1	11/12/2018	0.10
Gadwall	*Mareca strepera*	20	19/10/2018	3.80
Mallard	*Anas platyrhynchos*	29	11/12/2018	5.20
Teal	*Anas crecca*	56	19/10/2018	15.20
Tufted Duck	*Aythya fuligula*	1	11/12/2018	0.10
Pheasant	*Phasianus colchicus*	5	11/12/2018	1.00
Little Grebe	*Tachybaptus ruficollis*	3	19/11/2018	1.00
Grey Heron	*Ardea cinerea*	2	13/03/2018	0.30
Marsh Harrier	*Circus aeruginosus*	1	19/10/2018	0.20
Buzzard	*Buteo buteo*	1	19/10/2018	0.10
Moorhen	*Gallinula chloropus*	6	19/10/2018	1.00
Coot	*Fulica atra*	7	19/10/2018	2.30
Black-headed Gull	*Chroicocephalus ridibundus*	1	11/12/2018	0.10
Stock Dove	*Columba oenas*	76	19/10/2018	8.20
Woodpigeon	*Columba palumbus*	104	11/12/2018	24.40
Little Owl	*Athene noctua*	1	19/10/2018	0.30
Great Spotted Woodpecker	*Dendrocopos major*	2	19/10/2018	0.60
Green Woodpecker	*Picus viridis*	1	21/02/2018	0.30
Kestrel	*Falco tinnunculus*	2	19/10/2018	0.60
Jay	*Garrulus glandarius*	2	21/02/2018	0.20
Magpie	*Pica pica*	10	19/11/2018	2.80
Carrion Crow	*Corvus corone*	22	19/10/2018	3.90
Blue Tit	*Cyanistes caeruleus*	2	11/12/2018	0.50
Great Tit	*Parus major*	5	21/02/2018	1.40

Species (Common Name)	Scientific Name	Peak Count	Date of Peak Count	Mean Count
Skylark	*Alauda arvensis*	10	19/10/2018	1.40
Cetti's Warbler	*Cettia cetti*	3	19/10/2018	0.90
Long-tailed Tit	*Aegithalos caudatus*	9	19/11/2018	1.30
Wren	*Troglodytes troglodytes*	5	19/10/2018	1.70
Starling	*Sturnus vulgaris*	12	13/03/2018	2.40
Blackbird	*Turdus merula*	8	11/12/2018	1.80
Fieldfare	*Turdus pilaris*	38	19/11/2018	5.50
Redwing	*Turdus iliacus*	8	19/11/2018	1.90
Song Thrush	*Turdus philomelos*	1	13/03/2018	0.50
Robin	*Erithacus rubecula*	10	19/10/2018	2.70
House Sparrow	*Passer domesticus*	8	13/03/2018	1.90
Dunnock	*Prunella modularis*	2	21/02/2018	0.60
Pied Wagtail	*Motacilla alba*	2	19/10/2018	0.40
Meadow Pipit	*Anthus pratensis*	10	19/10/2018	2.10
Chaffinch	*Fringilla coelebs*	4	19/10/2018	1.40
Greenfinch	*Chloris chloris*	1	16/01/2019	0.10
Linnet	*Linaria cannabina*	3	16/01/2019	0.60
Goldfinch	*Carduelis carduelis*	5	19/10/2018	1.20
Yellowhammer	*Emberiza citrinella*	1	13/03/2018	0.10

5. Evaluation

Desk Study

5.1 Records of 131 protected / notable species were returned from the KMBRC data search. Of these 131 species:

- 36 are listed on Annex 1 of the EU Birds Directive;
- 29 are listed as a priority species on the UK Biodiversity action plan and as a species of principal importance under Section 41 of the NERC Act;
- 42 species are included on the Birds of Conservation Concern Red List;
- 78 species are included on the Birds of Conservation Concern Amber List; and
- six species are listed on the Kent Red Data Book (as detailed in section 2.3).

5.2 Of the 131 protected / notable species returned from the data search, 34 species have the potential to occur on the Site during the non-breeding (wintering) season and 19 of those 34 species were recorded on the Site during field surveys. The 15 species that were identified during the desk study that have the potential to occur within the terrestrial habitat on the Site, but were not recorded during wintering bird surveys were: Little Egret Egretta garzetta, Greylag Goose Anser anser, Shelduck Tadorna tadorna, Wigeon Anas penelope, Merlin Falco columbarius, Grey Partridge Perdix perdix, Golden Plover Pluvialis apricaria, Woodcock Scolopax rusticola, Common Gull Larus canus, Lesser Black-backed Gull Larus fuscus, Herring Gull Larus argentatus, Kingfisher Alcedo atthis, Grey Wagtail Motacilla cinerea, Mistle Thrush Turdus viscivorus and Reed Bunting Emberiza schoeniclus.

Field survey

5.3 A total of 43 bird species were recorded during the wintering bird survey. Of these 43 bird species recorded, 18 species recorded during the survey meet at least one of a range of criteria relating to conservation importance, as listed in section 2 of this report. These 18 species and their relevant list of conservation importance are shown below in Table 5.1.

Table 4 - Conservation Status of Wintering Birds Recorded on Site

Species (Common Name)	Annex 1 EU Birds Directive	Birds of Conservation Concern	UK BAP Priority Species	NERC Species of Principal Importance
Mute Swan	-	Amber	-	-
Gadwall	-	Amber	-	-
Mallard	-	Amber	-	-
Teal	-	Amber	-	-
Marsh Harrier	X	-	-	-
Black-headed Gull	-	Amber	-	-
Stock Dove	-	Amber	-	-
Kestrel	-	Amber	-	-
Skylark	-	Red	X	X
Starling	-	Red	X	X
Fieldfare	-	Red	-	-
Redwing	-	Red	-	-
Song Thrush	-	Red	X	X

Species (Common Name)	Annex 1 EU Birds Directive	Birds of Conservation Concern	UK BAP Priority Species	NERC Species of Principal Importance
House Sparrow	-	Red	X	X
Dunnock	-	Amber	X	X
Meadow Pipit	-	Amber	-	-
Linnet	-	Red	X	X
Yellowhammer	-	Red	X	X

5.4 One species (Marsh Harrier), listed on Annex I of the EC Birds Directive (2009) was recorded flying over the survey area.

5.5 A total of seven priority species (Skylark, Starling, Song Thrush, House Sparrow, Dunnock, Linnet and Yellowhammer) listed on the UK Biodiversity Action Plan and included as Species of Principal Importance on the NERC list, were recorded within the survey area.

5.6 Eight species (Skylark, Starling, Song Thrush, House Sparrow, Linnet, Yellowhammer, Fieldfare and Redwing), included on the BoCC Red List, were recorded within the survey area. Additionally, nine species (Mute Swan, Gadwall, Mallard, Teal, Black-headed Gull, Stock Dove, Kestrel, Dunnock and Meadow Pipit), included on the BoCC Amber List species were also recorded within the survey area.

5.7 None of the six Kent Red Data Book wintering bird species, as detailed in section 2.3, were recorded on Site.

Species abundance

5.8 In addition to evaluating a site based on its populations of wintering birds in relation to legal status, rarity and conservation value, consideration has to be given to the value of the site for the population of individual species that it supports. This can be done by comparing the population present on site with the national and county wintering population for certain species

5.9 No counts of wintering bird species recorded across the Site approaches the 1% level of the national wintering population estimates as detailed in Musgrove et al. (2013).

5.10 Most of the wintering bird species were recorded within the survey area in low numbers during wintering bird surveys and it is unlikely that counts of any species form a significant proportion (i.e. 1% or more) of the county population. Therefore, species' populations across the survey area are considered to be of no more than local importance in winter.

Species diversity

5.11 Evaluation was made of the species assemblage and numbers recorded during surveys, located in Kent, with respect to criteria for selection of Local Wildlife Sites (as detailed in section 3.3.3).

5.12 None of the species, recorded within the survey area during wintering bird surveys, meets any of the criteria for selection of a Local Wildlife Site.

Species distribution

5.13 The location of protected / notable bird species, included on one or more of the lists of conservation importance (see Table 5.1) are shown in Figure 2 (Appendix B). A summary of the distribution of these protected / notable species is also provided in the following text:

- Mute Swan –recorded on the waterbody north west of 'Sand and Gravel Works', outside of the Site boundary;
- Gadwall – recorded on waterbodies outside of the Site boundary;

- Mallard – recorded on waterbodies outside the Site boundary;
- Teal – recorded on waterbodies outside of the Siye boundary and within the ditch adjacent to the DC cable corridor;
- Black-headed Gull - recorded outside of the Site boundary, on the waterbody north west of 'Sand and Gravel Works' and within tall ruderal grassland north east of Perry's Farm;
- Stock Dove – recorded within the proposed converter station site in arable fields and in scrub north west of 'Sand and Gravel Works';
- Kestrel – a mobile species, recorded flying over the DC cable corridor;
- Marsh Harrier - recorded flying over the proposed DC cable corridor;
- Skylark – recorded in arable fields to the south and south west of Perry's Farm, within the proposed converter station location. This species was also recorded outside of the proposed development areas;
- Starling – recorded throughout the Site, with birds observed in tall ruderal grassland north-east of Perry's Farm and within the proposed converter station site in arable fields south west of Perry's Farm. This species was also recorded outside of the proposed development areas;
- Song Thrush - recorded in low numbers in scrub along the DC cable corridor;
- House Sparrow – only recorded south of West Lane and north of residential buildings, just outside of the proposed DC cable corridor;
- Dunnock - recorded in low numbers throughout the Site, including in scrub within the proposed DC cable corridor;
- Linnet – recorded sporadically around the Site in low numbers;
- Yellowhammer – only one recorded, within the proposed DC cable corridor;
- Redwing and Fieldfare - recorded in low numbers throughout the Site, utilising arable fields within the proposed converter station site and on fruiting plant species found in hedgerows and scrub along the proposed DC cable corridor;
- Meadow Pipit – recorded in fields within the temporary DC cable route north of 'Sand and Gravel Works', and in the field south east of Perry's Farm.

6. Identification of Constraints and Recommendations

Potential Impacts of Development on Wintering Birds

6.1 In the absence of mitigation, the Proposed Development has the potential to impact on the wintering bird assemblage identified on Site. These potential impacts are:

- permanent habitat loss and fragmentation, including a reduction in prey assemblages, availability and foraging opportunities, through construction and operation of the substation and converter station;
- temporary habitat loss and fragmentation, including a reduction in prey assemblages, availability and foraging opportunities, through construction of the cable corridor;
- temporary displacement and/or loss of wintering populations, during construction;
- increase in lighting (during operation of the substation and converter station), effecting nocturnal species such as Little Owl; and
- temporary disturbance (visual and noise), during construction.

Outline Mitigation Proposals

6.2 To reduce the potential impacts on the wintering bird assemblage, a number of measures can be included within the design of the Proposed Development. These outline measures are recommended to ensure that the impacts on the wintering bird assemblage are minimised and it is recommended that these proposals are formalised through a Construction Environmental Management Plan (CEMP) or precautionary working method statement for the Site.

Habitat Retention

6.3 During construction, the Proposed Development should seek to retain as much of the existing habitat as possible, outside of the working areas. To avoid unnecessary intrusion of work vehicles / site personnel into habitat outside of the working areas (which would cause unnecessary habitat loss), fencing should be erected around the construction areas.

Habitat Loss, creation and Restoration

6.4 The Proposed Development will incur permanent loss of the arable fields to the south and south west of Perry's Farm (see Figure 1). This will result in habitat loss for a small number of wintering birds, including species of conservation concern such as Skylark and Stock Dove, recorded in these areas.

6.5 Therefore, the landscaping for the Site should seek to include suitable habitat creation to alleviate the potential effects on the wintering bird assemblage in these areas and enhance these areas, where possible, with the objective of conserving a similarly diverse assemblage of wintering birds to what is already present on Site. The creation of an area of set-aside or 'cover crop' would benefit a range of arable farmland passerines present within the Site, including Yellowhammer, Linnet and Skylark. These species are reliant on farmland habitats during winter months for feeding and shelter. The opportunity should be sought to potentially manage any areas of redundant farmland generated by the Proposed Development in this way.

6.6 The Proposed Development will also incur temporary habitat loss of scrub, hedgerows and tall ruderal habitat along the extent of the cable corridor. Post-construction, any habitat loss within the cable corridor should be restored on a like for like basis and habitat creation / restoration should include the planting of mixed native species of trees and scrub, including fruiting species such as Hawthorn Crataegus monogyna and Blackthorn Prunus spinosa, which through the provision of berries will provide foraging and roosting habitat for wintering birds.

6.7 Ideally, where any new habitats are proposed, these should be planted and functional in advance of construction, so that any displaced populations have alternative areas of habitats available.

Lighting

6.8 To minimise the impact of lighting on nocturnal species during both construction and operation, consideration should be made to the location, height, direction, timing and type of lighting that is used to avoid unnecessary light spillage concordant with the requirements to minimise light spill on boundary habitats for bats. Details of lighting should be included in the CEMP.

Appendix A

Table A.1 - KMBRC Data Search List of protected / notable bird species within 2 km of the Site and within the last 10 years

Common Name	Scientific Name	Conservation Designation
Red-throated Diver	*Gavia stellata*	BirdsDir:A1; KRDB3;
Black-throated Diver	*Gavia arctica*	BAP; S41; BoCC4:Amber; BirdsDir:A1
Great Northern Diver	*Gavia immer*	BoCC4:Amber; BirdsDir:A1
Black-necked Grebe	*Podiceps nigricollis*	BoCC4:Amber
Fulmar	*Fulmarus glacialis*	BoCC4:Amber
Manx Shearwater	*Puffinus puffinus*	BoCC4:Amber
Leach's Petrel	*Oceanodroma leucorhoa*	BoCC4:Amber; BirdsDir:A1
Gannet	*Morus bassanus*	BoCC4:Amber
Shag	*Phalacrocorax aristotelis*	BoCC4:Red
Bittern	*Botaurus stellaris*	BAP; BoCC4:Amber; BirdsDir:A1; S41
Little Egret	*Egretta garzetta*	BirdsDir:A1;
Great White Egret	*Ardea alba*	BirdsDir:A1
Spoonbill	*Platalea leucorodia*	BoCC4:Amber; BirdsDir:A1
Mute Swan	*Cygnus olor*	BoCC4:Amber
Bewick's Swan	*Cygnus columbianus*	BoCC4:Amber
Whooper Swan	*Cygnus cygnus*	BoCC4:Amber; BirdsDir:A1
Pink-footed Goose	*Anser brachyrhynchus*	BoCC4:Amber
White-fronted Goose	*Anser albifrons*	BAP; BoCC4:Red; KRDB3; S41
Greylag Goose	*Anser anser*	BoCC4:Amber
Barnacle Goose	*Branta leucopsis*	BoCC4:Amber; BirdsDir:A1
Brent Goose	*Branta bernicla*	BAP; BoCC4:Amber; S41
Ruddy Shelduck	*Tadorna ferruginea*	BirdsDir:A1
Shelduck	*Tadorna tadorna*	BoCC4:Amber
Wigeon	*Anas penelope*	BoCC4:Amber
Gadwall	*Anas strepera*	BoCC4:Amber
Teal	*Anas crecca*	BoCC4:Amber
Mallard	*Anas platyrhynchos*	BoCC4:Amber
Pintail	*Anas acuta*	BoCC4:Amber; KRDB3
Garganey	*Spatula querquedula*	BoCC4:Amber
Shoveler	*Anas clypeata*	BoCC4:Amber
Pochard	*Aythya ferina*	BoCC4:Red
Scaup	*Aythya marila*	BAP; BoCC4:Red; S41
Eider	*Somateria mollissima*	BoCC4:Amber (subsp. Red)

Common Name	Scientific Name	Conservation Designation
Long-tailed Duck	*Clangula hyemalis*	BoCC4:Red
Common Scoter	*Melanitta nigra*	BAP; BoCC4:Red; S41
Velvet Scoter	*Melanitta fusca*	BoCC4:Red
Goldeneye	*Bucephala clangula*	BoCC4:Amber
Honey Buzzard	*Pernis apivorus*	BoCC4:Amber; BirdsDir:A1
Black Kite	*Milvus migrans*	BirdsDir:A1
Red Kite	*Milvus milvus*	BirdsDir:A1
Marsh Harrier	*Circus aeruginosus*	BoCC4:Amber; BirdsDir:A1;
Hen Harrier	*Circus cyaneus*	BoCC4:Red; BirdsDir:A1; S41
Montagu's Harrier	*Circus pygargus*	BoCC4:Amber; BirdsDir:A1
Osprey	*Pandion haliaetus*	BoCC4:Amber; BirdsDir:A1
Kestrel	*Falco tinnunculus*	BoCC4:Amber
Merlin	*Falco columbarius*	BoCC4:Red; BirdsDir:A1
Peregrine	*Falco peregrinus*	BirdsDir:A1
Grey Partridge	*Perdix perdix*	BAP; BoCC4:Red; S41
Oystercatcher	*Haematopus ostralegus*	BoCC4:Amber
Avocet	*Recurvirostra avosetta*	BoCC4:Amber; ; BirdsDir:A1; KRDB3;
Ringed Plover	*Charadrius hiaticula*	BoCC4:Red
Golden Plover	*Pluvialis apricaria*	BirdsDir:A1
Grey Plover	*Pluvialis squatarola*	BoCC4:Amber
Lapwing	*Vanellus vanellus*	BAP; BoCC4:Red; S41
Knot	*Calidris canutus*	BoCC4:Amber; KRDB3
Sanderling	*Calidris alba*	BoCC4:Amber
Curlew Sandpiper	*Calidris ferruginea*	BoCC4:Amber
Purple Sandpiper	*Calidris maritima*	BoCC4:Amber
Dunlin	*Calidris alpina*	BoCC4:Amber; BirdsDir:A1
Ruff	*Caldris pugnax*	BirdsDir:A1
Snipe	*Gallinago gallinago*	BoCC4:Amber
Woodcock	*Scolopax rusticola*	BoCC4:Red
Black-tailed Godwit	*Limosa limosa*	BAP; BoCC4:Red; S41; KRDB3
Bar-tailed Godwit	*Limosa lapponica*	BoCC4:Amber; BirdsDir:A1
Whimbrel	*Numenius phaeopus*	BoCC4:Red
Curlew	*Numenius arquata*	BAP; BoCC4:Red; S41
Spotted Redshank	*Tringa erythropus*	BoCC4:Amber
Redshank	*Tringa totanus*	BoCC4:Amber
Greenshank	*Tringa nebularia*	BoCC4:Amber
Green Sandpiper	*Tringa ochropus*	BoCC4:Amber
Wood Sandpiper	*Tringa glareola*	BoCC4:Amber; BirdsDir:A1

Common Name	Scientific Name	Conservation Designation
Common Sandpiper	*Actitis hypoleucos*	BoCC4:Amber
Turnstone	*Arenaria interpres*	BoCC4:Amber
Arctic Skua	*Stercorarius parasiticus*	BAP; S41; BoCC4:Red
Great Skua	*Stercorarius skua*	BoCC4:Amber
Mediterranean Gull	*Ichthyaetus melanocephalus*	BoCC4:Amber; BirdsDir:A1
Little Gull	*Larus minutus*	BirdsDir:A1;
Black-headed Gull	*Chroicocephalus ridibundus*	BoCC4:Amber
Common Gull	*Larus canus*	BoCC4:Amber
Lesser Black-backed Gull	*Larus fuscus*	BoCC4:Amber
Herring Gull	*Larus argentatus*	BAP; BoCC4:Red; S41
Yellow-legged Gull	*Larus michahellis*	BoCC4:Amber
Glaucous Gull	*Larus hyperboreus*	BoCC4:Amber
Great Black-backed Gull	*Larus marinus*	BoCC4:Amber
Kittiwake	*Rissa tridactyla*	BoCC4:Red
Sandwich Tern	*Thalasseus sandvicensis*	BoCC4:Amber; BirdsDir:A1
Common Tern	*Sterna hirundo*	BoCC4:Amber; BirdsDir:A1
Arctic Tern	*Sterna paradisaea*	BoCC4:Amber; BirdsDir:A1
Little Tern	*Sterna albifrons*	BoCC4:Amber; BirdsDir:A1
Black Tern	*Chlidonias niger*	BoCC4:Amber; BirdsDir:A1
Guillemot	*Uria aalge*	BoCC4:Amber
Razorbill	*Alca torda*	BoCC4:Amber
Puffin	*Fratercula arctica*	BoCC4:Red
Stock Dove	*Columba oenas*	BoCC4:Amber;
Turtle Dove	*Streptopelia turtur*	BAP; BoCC4:Red; S41
Cuckoo	*Cuculus canorus*	BAP; BoCC4:Red; S41
Tawny Owl	*Strix aluco*	BoCC4:Amber
Short-eared Owl	*Asio flammeus*	BoCC4:Amber; BirdsDir:A1
Swift	*Apus apus*	BoCC4:Amber
Kingfisher	*Alcedo atthis*	BoCC4:Amber (subsp. Red); BirdsDir:A1
Wryneck	*Jynx torquilla*	BAP; S41
Skylark	*Alauda arvensis*	BAP; BoCC4:Red; S41
Shore Lark	*Eremophila alpestris*	BoCC4:Amber
House Martin	*Delichon urbica*	BoCC4:Amber
Tree Pipit	*Anthus trivialis*	BAP; BoCC4:Red; S41
Meadow Pipit	*Anthus pratensis*	BoCC4:Amber
Water Pipit	*Anthus spinoletta*	BoCC4:Amber

Common Name	Scientific Name	Conservation Designation
Yellow Wagtail	*Motacilla flava*	BAP; BoCC4:Red; S41
Grey Wagtail	*Motacilla cinerea*	BoCC4:Red
Dunnock	*Prunella modularis*	BAP; BoCC4:Amber; S41
Nightingale	*Luscinia megarhynchos*	BoCC4:Red
Black Redstart	*Phoenicurus ochruros*	BoCC4:Red
Redstart	*Phoenicurus phoenicurus*	BoCC4:Amber
Whinchat	*Saxicola rubetra*	BoCC4:Red
Fieldfare	*Turdus pilaris*	BoCC4:Red
Song Thrush	*Turdus philomelos*	BAP; BoCC4:Red; S41
Redwing	*Turdus iliacus*	BoCC4:Red
Mistle Thrush	*Turdus viscivorus*	BoCC4:Red
Dartford Warbler	*Sylvia undata*	BoCC4:Amber; BirdsDir:A1
Spotted Flycatcher	*Muscicapa striata*	BAP; BoCC4:Red; S41
Pied Flycatcher	*Ficedula hypoleuca*	BoCC4:Red
Starling	*Sturnus vulgaris*	BAP; BoCC4:Red; ; S41
House Sparrow	*Passer domesticus*	BAP; BoCC4:Red; S41
Linnet	*Linaria cannabina*	BAP; BoCC4:Red; S41
Twite	*Linaria flavirostris*	BAP; BoCC4:Red; S41
Lesser Redpoll	*Ancanthis cabaret*	BAP; BoCC4:Red; S41
Lapland Bunting	*Calcarius lapponicus*	BoCC4:Amber
Snow Bunting	*Plectrophenax nivalis*	BoCC4:Amber
Yellowhammer	*Emberiza citrinella*	BAP; BoCC4:Red; S41
Reed Bunting	*Emberiza schoeniclus*	BAP; BoCC4:Amber; S41
Corn Bunting	*Emberiza calandra*	BAP; BoCC4:Red; S41

* BirdsDir:A1 = Species listed on Annex 1 of the Birds Directive; S41 = The Natural Environment and Rural Communities (NERC) list of Species of Principal Importance; BAP = UK Biodiversity Action Plan (BAP) priority bird species; BoCC4 = Birds of Conservation Concern; and KRDB3 = Kent Red Data Book wintering bird species

Appendix B

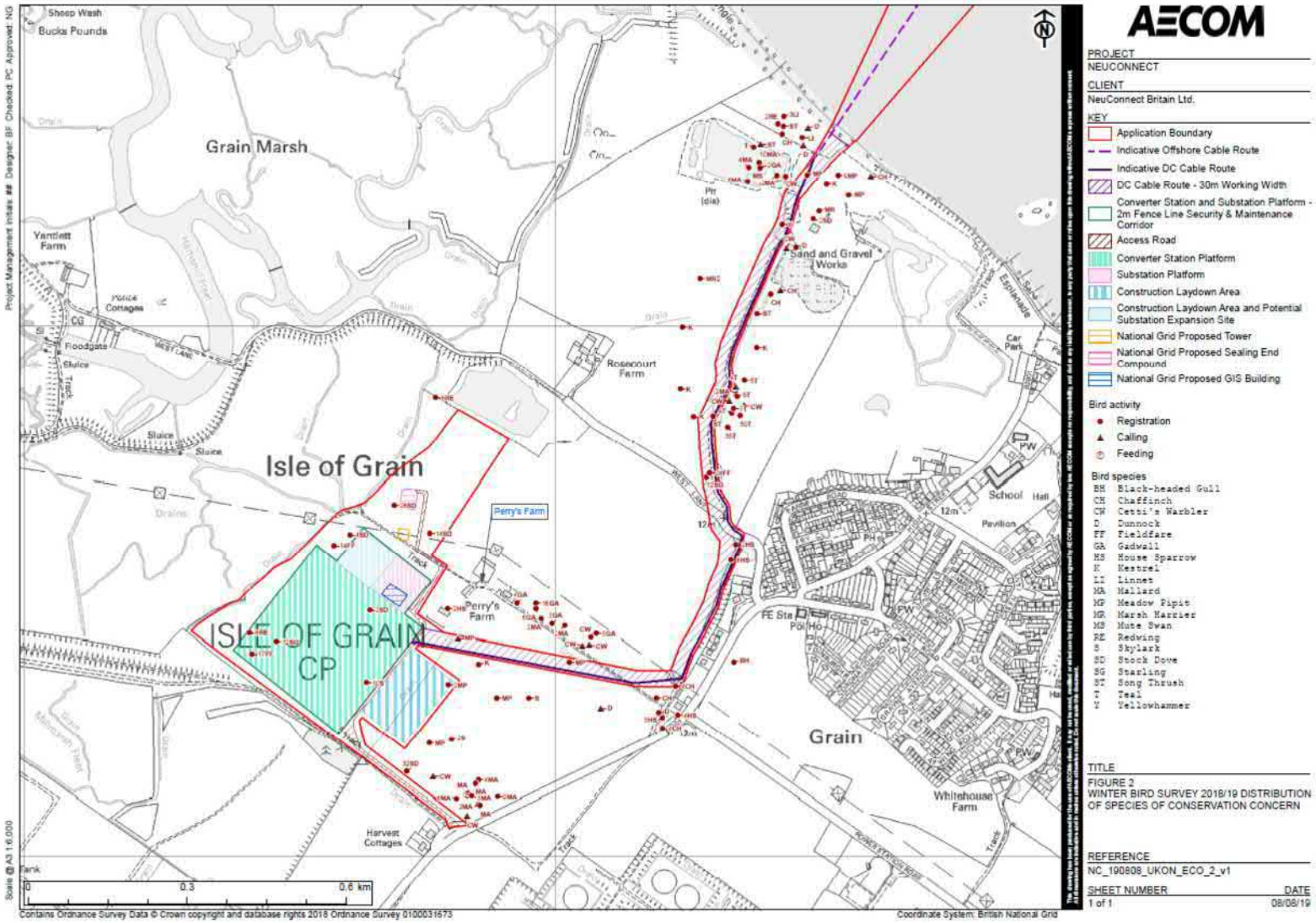

Figure 2 – Location of Protected / Notable Species Recorded on Site

Appendix 6.D – Report on Surveys for Intertidal Waterbirds

NeuConnect GB Onshore Scheme

Environmental Statement

Appendix 6D – Report on Surveys for Intertidal Waterbirds

NeuConnect Britain Limited

September 2019

Quality information

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1. Introduction

1.1 AECOM was instructed by NeuConnect Britain Limited (the 'Applicant') to undertake intertidal ornithological surveys for the proposed development (the 'Proposed Development') of an electricity convertor station and substation at Grain, Isle of Grain. The proposed electricity converter station and substation will form part of a Direct Current (DC) electricity link (referred to as an interconnector) between Great Britain and Germany. As part of the application(s), the Applicant may also seek outline planning permission for underground DC and alternating current (AC) cables, however this is subject to the Applicant's permitted development status.

The Project

1.2 NeuConnect (the Project) is a 1,400 megawatt (MW) interconnector between Great Britain and Germany. The Project will create the first direct electricity link between Great Britain and German energy networks. The new link will provide a connection for electricity to be passed in either direction between Great Britain and Germany. The Project will be formed by approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HVDC) cables, with on-shore converter stations linking into the existing electricity grids in Great Britain and Germany.

1.3 The Proposed Development will comprise of three structures, a converter station, sub-station and a direct current (DC) cable route (see Figure 1).

1.4 The footprint of the proposed converter station to the perimeter security fence is expected to be up to approximately 250 metres (m) by 250 metres, with a maximum height of up to 26 m.

1.5 The footprint of the proposed substation to the perimeter security fence is expected to be approximately 80 m by 80 m, with a maximum height of 14 m.

1.6 The proposed DC cable corridor will be approximately 1.6 km long (from landfall to the converter station). The preferred installation method will be underground, which will result in a temporary loss of land during installation. The working corridor for the installation of the cable corridor will be 30 m.

1.7 Additional laydown areas will be required for construction, comprising 1.5 hectare (ha) for the converter laydown and 0.3 ha for the substation laydown.

Site Description

1.8 The Proposed Development area (the Site) is entirely within the boundary of Medway Council and is centred on the Isle of Grain located at the tip of the Hoo Peninsula between the Thames Estuary to the north and the Medway Estuary to the south. The Site is located to the west of the village of Grain, Isle of Grain, Kent at Ordnance Survey (OS) central grid reference TQ 88205 76727. Land use comprises a mix of industrial development to the south, the small settlement of Grain to the southeast and undeveloped land, much of which is designated for ecological interests, to the north (along the coastline) and to the west. Land within the Site and in the immediate vicinity has historically been used for the extraction of gravel and sand and the resultant voids used for landfill.

1.9 Figure 1 shows the Site boundary (red-line), the cable corridor (purple line) and proposed location of each structure.

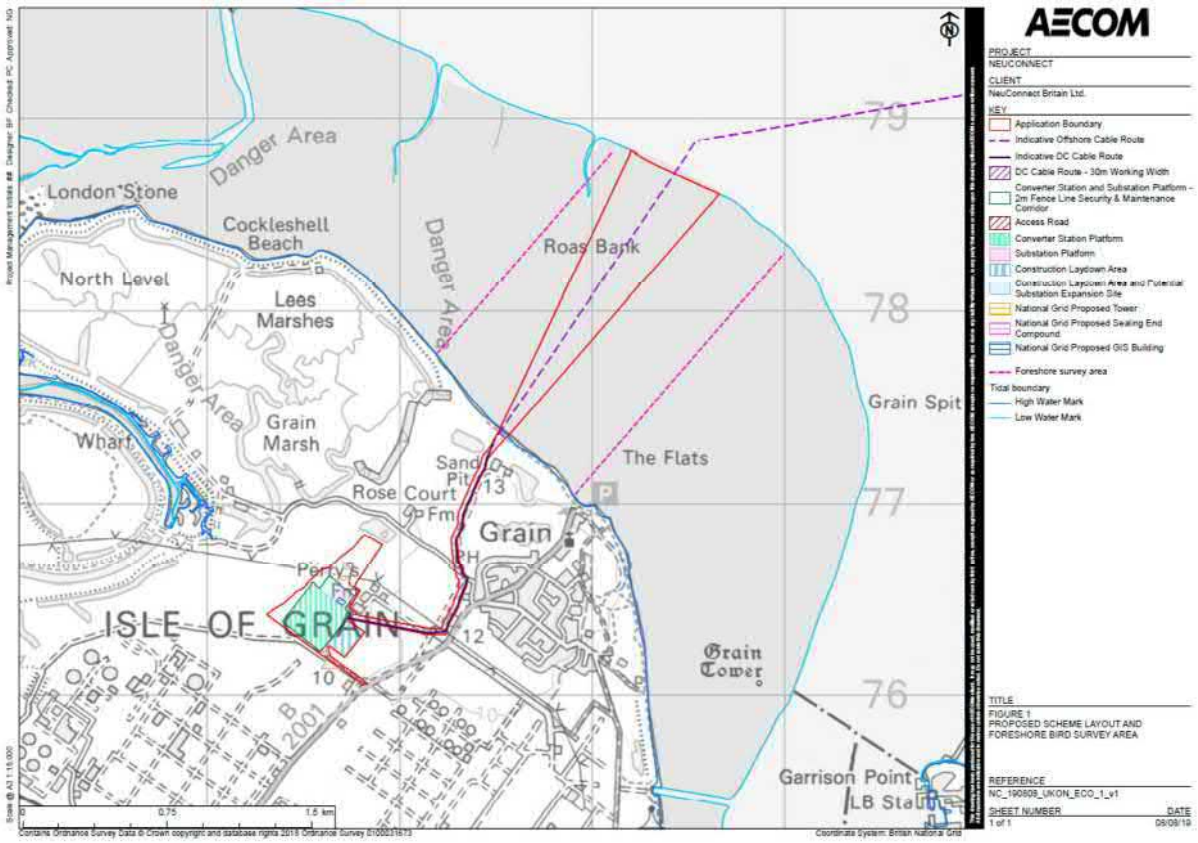

Figure 1 - Intertidal survey area, Site boundary and location of DC cable, proposed substation and proposed converter station

Survey Area

1.10 The survey area is shown in Figure 1 and includes the intertidal areas of the Proposed Development with the addition of a 500 m buffer zone either side.

2. Designated Sites

2.1 The Site sits adjacent to the Thames Estuary and Marshes Ramsar Special Protection Area (SPA) and South Thames Estuary and Marshes Site of Special Scientific Interest (SSSI) and within 2 km of the Medway Estuary and Marshes Ramsar, SPA and SSSI (Figure 2).

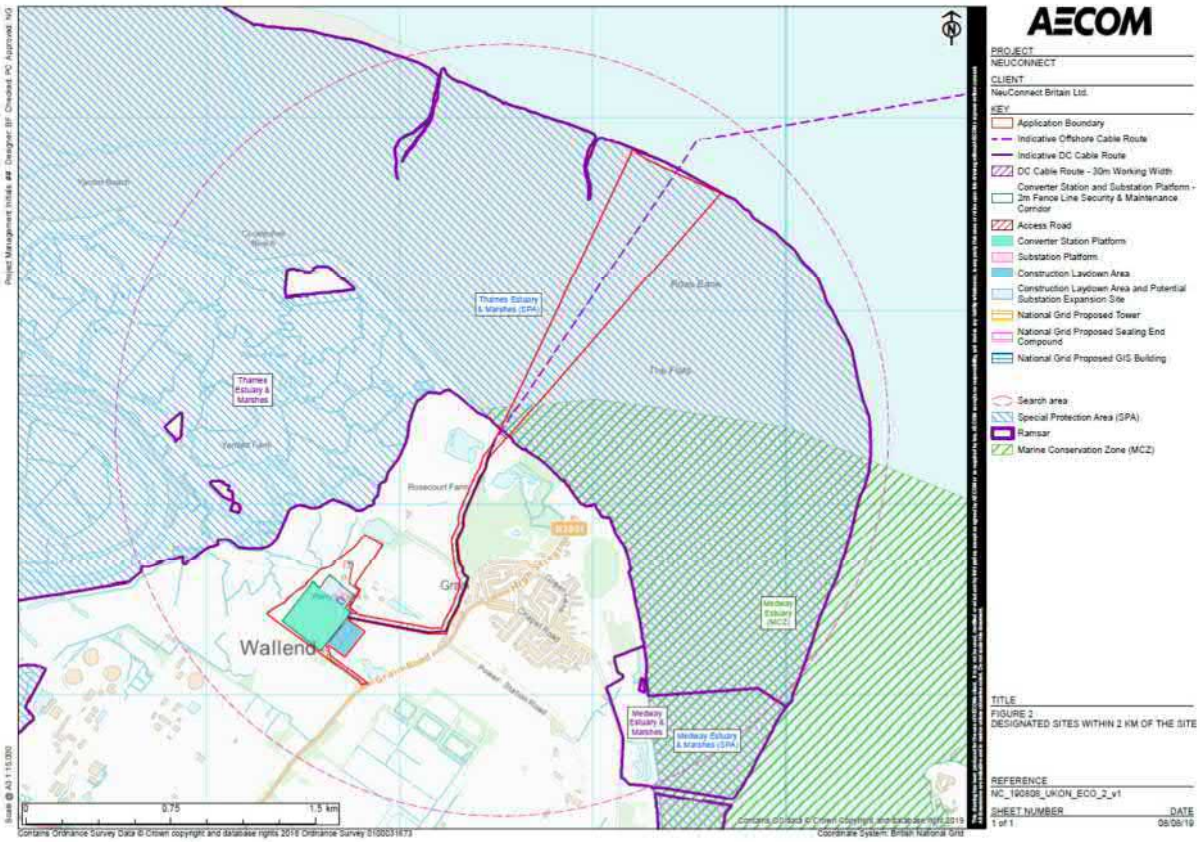

Figure 2 - Designated Sites within 2 km of the Site

2.2 These sites are designated for supporting internationally important waterbird populations and assemblages.

2.3 There are four other statutory sites of international nature conservation importance within 10 km of the Proposed Development, but less than 5 km from the Proposed Development site, designated either solely (or in part) for their ornithological interest. These sites are:

- Outer Thames Estuary SPA (2.2 km north of the Proposed Development site);
- Benfleet and Southend Marshes Ramsar / SPA (4.2 km north of the Proposed Development site);
- Foulness (Mid-Essex Coast Phase 5) Ramsar / SPA (4.9 km north-east of the Proposed Development site); and
- Swale Ramsar SPA (7.1 km south-east of the Proposed Development site.

2.4 For the purposes of this assessment, these designated sites are not considered further, given the distance between these sites and the Proposed Development Site. However, it is acknowledged that there will be interchange of individual waterbirds between designated sites in south-east England, but these individuals will be captured within the assessment of the Thames and Medway Estuaries complex of designated sites.

Designated Site Descriptions

2.5 The following sections in this report summarise the ornithological interest features of the Thames Estuary and Marshes Ramsar and SPA, South Thames Estuary and Marshes SSSI and Medway Estuary and Marshes Ramsar, SPA and SSSI.

2.6 The legal list of qualifying species, for which a SPA is selected and managed, is given on the relevant SPA citation, but a review of the UK network of SPAs was co-ordinated by Joint Nature Conservation Committee (JNCC) in the late 1990s. Following formal submission to, and agreement by, relevant Ministers, the results were published in 2001.

2.7 However, it has taken time to revise all the relevant SPA citations in light of the review. Therefore, where there is a discrepancy between species listed in extant citations and listed in the 2001 Review for the same sites, there has been confusion as to the correct list of qualifying species to be used at any site for purposes of management, assessment and development control.

2.8 At sites where there remain differences between species listed in the 2001 Review and the extant site citation, then the original citations for the relevant sites have been used as the primary source within the evaluation.

Thames Estuary and Marshes SPA

2.9 The Thames Estuary and Marshes SPA is located on the south side of the Thames Estuary in southern England. The marshes extend for about 15 km along the south side of the estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea wall, there is a small extent of saltmarsh and broad intertidal mud-flats. The estuary and adjacent grazing marsh areas support an important assemblage of wintering waterbirds including grebes, geese, ducks and waders. The site is also important in spring and autumn migration periods.

2.10 The citation report (2000) for the SPA lists the following qualifying interest features:

2.11 The site qualifies under Article 4.1 of the Wild Birds Directive (2009/147/EC) as it is used regularly by 1% or more of the GB populations of the following species listed on Annex I, in any season:

- Avocet Recurvirostra avosetta, 283 individuals (5 year peak mean for 1993/94 to 1997/98); and
- Hen Harrier Circus cyaneus, seven individuals (5 year peak mean for 1993/94 to 1997/98).

2.12 The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed on Annex I), in any season:

- Ringed Plover Charadrius hiaticula, 1,324 individuals (5 year peak mean for 1993/94 to 1997/98).
- Grey Plover Pluvialis squatarola, 2,593 individuals (5 year peak mean for 1993/94 to 1997/98);
- Dunlin Calidris alpina, 29,646 individuals (5 year peak mean for 1993/94 to 1997/98);
- Knot Calidris canutus, 4,848 individuals (5 year peak mean for 1993/94 to 1997/98);
- Black-tailed Godwit Limosa limosa (islandica), 1,699 individuals (5 year peak mean for 1993/94 to 1997/98); and
- Redshank Tringa totanus, 3,251 individuals (5 year peak mean for 1993/94 to 1997/98).

2.13 The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterfowl in any season:

- Over winter, the area regularly supports 75,019 individual waterfowl (5 year peak mean 1991/92 to 1995/96).

2.14 The JNCC SPA review, although having no current legal standing, also includes information on the Thames Estuary and Marshes SPA and lists the qualifying features as:

2.15 This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

2.16 Over winter:

- Avocet, 276 individuals representing at least 21.7% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6); and
- Hen Harrier, seven individuals representing at least 0.9% of the wintering population in Great Britain (5 year mean 93/4-97/8).

2.17 This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

2.18 On passage:

- Ringed Plover, 559 individuals representing at least 1.1% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

2.19 Over winter:

- Ringed Plover, 541 individuals representing at least 1.1% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

2.20 The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.

2.21 Over winter, the area regularly supports 33,433 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Redshank, Black-tailed Godwit, Dunlin, Lapwing *Vanellus vanellus*, Grey Plover, Shoveler *Anas clypeata*, Pintail *Anas acuta*, Gadwall *Anas strepera*, Shelduck *Tadorna tadorna*, White-fronted Goose *Anser albifrons*, Little Grebe *Tachybaptus ruficollis*, Ringed Plover, Avocet and Whimbrel *Numenius phaeopus*.

2.22 The Standard Natura 2000 Data Form (May 2006) provides further details of the status of the Qualifying Interest Features of the SPA.

Thames Estuary and Marshes SPA Conservation Objectives

2.23 The Conservation Objectives for the SPA were revised and published by Natural England on 21st February 2019 and are as follows:

2.24 "With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change:

- Ensure that the integrity of the site is maintained or restored as appropriate and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
  - the extent and distribution of the habitats of the qualifying features;
  - the structure and function of the habitats of the qualifying features;
  - the supporting processes on which the habitats of the qualifying features rely;
  - the population of each of the qualifying features; and
  - the distribution of the qualifying features within the site.

2.25 The qualifying features of the SPA are listed as:

- Hen Harrier (Non-breeding);
- Avocet (Non-breeding);
- Ringed Plover (Non-breeding);
- Grey Plover (Non-breeding);
- Knot (Non-breeding);

- Dunlin (Non-breeding);
- Black-tailed Godwit (Non-breeding);
- Redshank (Non-breeding); and
- waterbird assemblage.

Thames Estuary and Marshes Ramsar

2.26 Ramsar sites are wetlands of international importance designated under the International Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention).

2.27 The site qualifies under the following Ramsar criteria:

2.28 Criterion 5 – Assemblages of international importance:

- Species with peak counts in winter: 45,118 waterfowl (5 year peak mean 1998/99-2002/03).

2.29 Criterion 6 – Species / populations occurring at levels of international importance:

- Species with peak counts in spring/autumn:
  - Ringed Plover, 595 individuals (5 year peak mean 1998/99-2002/03); and
  - Black-tailed Godwit, 1,640 individuals (5 year peak mean 1998/99-2002/03).
- Species with peak counts in winter:
  - Grey Plover, 1,643 individuals (5 year peak mean 1998/99-2002/03);
  - Knot, 7,279 individuals (5 year peak mean 1998/99-2002/03);
  - Dunlin, 15,171 individuals (5 year peak mean 1998/99-2002/03); and
  - Redshank, 1,178 individuals (5 year peak mean 1998/99-2002/03).

2.30 The following species are listed as ‘noteworthy fauna’ on the citation - species currently occurring at levels of national importance:

- Species with peak counts in spring / autumn:
  - Little Grebe, 251 individuals (5 year peak mean 1998/99-2002/03);
  - Little Egret Egretta garzetta, 54 individuals (5 year peak mean 1998/99-2002/03);
  - Ruff Philomachus pugnax, 23 individuals (5 year peak mean 1998/99-2002/03); and
  - Greenshank Tringa nebularia, 38 individuals (5 year peak mean 1998/99-2002/03).
- Species with peak counts in winter:
  - Shelduck, 1,238 individuals (5 year peak mean 1998/99-2002/03);
  - Gadwall, 359 individuals (5 year peak mean 1998/99-2002/03);
  - Shoveler, 288 individuals (5 year peak mean 1998/99-2002/03);
  - Water Rail Rallus aquaticus, 6 individuals (5 year peak mean 1998/99-2002/03);
  - Avocet, 607 individuals (5 year peak mean 1998/99-2002/03); and
  - Spotted Redshank Tringa erythropus, 6 individuals (5 year peak mean 1998/99-2002/03).

South Thames Estuary and Marshes Site of Special Scientific Interest

2.31 The statutory nature conservation agencies have a duty under the Wildlife and Countryside Act 1981, as amended, to notify any land which in their opinion is ‘of special interest by reason of any flora, fauna, or geological or physiographical features’. Such areas are known as Sites of Special Scientific Interest.

2.32 The notification for the South Thames Estuary and Marshes SSSI states:

> *'The South Thames Estuary and Marshes SSSI from Gravesend to the eastern end of the Isle of Grain forms a major component of the Greater Thames Estuary. The site consists of an extensive mosaic of grazing marsh, saltmarsh, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes.*
>
> *The site supports outstanding numbers of waterfowl with total counts regularly exceeding 20,000. Many species regularly occur in nationally important numbers and some species regularly use the site in internationally important numbers. The breeding bird community is also of particular interest. The diverse habitats within the site support a number of nationally rare and scarce invertebrate species and an assemblage of nationally scarce plants.*
>
> *The mudflats attract large numbers of feeding waders and wildfowl with the site being regularly used by Redshank in internationally important numbers. There is evidence from recent winter low-water counts that Knot and Dunlin exceed internationally important numbers when feeding on the mudflats. These counts also indicate that Avocet and Ringed Plover regularly exceed nationally important numbers'.*

Medway Estuary and Marshes SPA

2.33 The Medway Estuary feeds into and lies on the south side of the outer Thames Estuary in Kent, south-east England. It forms a single tidal system with the Swale and joins the Thames Estuary between the Isle of Grain and Sheerness. It has a complex arrangement of tidal channels, which drain around large islands of saltmarsh and peninsulas of grazing marsh. The mud-flats are rich in invertebrates and also support beds of the macro-alga Enteromorpha flexuosa and some Eelgrasses Zostera species. Small shell beaches occur, particularly in the outer part of the estuary.

2.34 The citation report (1993) for the SPA lists the following qualifying interest features:

2.35 The site qualifies under Article 4.1 of the Directive (2009/147/EC) by supporting, in summer, populations of European importance of the following species listed on Annex I of the Directive:

2.36 During the breeding season:

- Avocet, 28 pairs; and
- Little Tern Sternula albifrons, 24 pairs.

2.37 The site also qualifies under Article 4.1 by regularly supporting a nationally important wintering population of:

- Avocet, 70 individuals (5 year peak mean 1986/87 - 1990/1).

2.38 The site also qualifies under Article 4.2 as a wetland of international importance by regularly supporting at least 20,000 waterfowl, with an average peak count of 53,900 birds recorded in the five winter period (1986/87 – 1990/91). This total includes internationally or nationally important wintering populations of the following (with average peak counts recorded in the five winter period 1986/87-1990/91):

- 4,130 Dark-bellied Brent Goose Branta bernicla bernicla;
- 5,900 Shelduck;
- 980 Pintail;
- 740 Ringed Plover;
- 4,810 Grey Plover;
- 3,690 Knot;
- 22,900 Dunlin;
- 4,180 Redshank;
- 250 Great Crested Grebe Podiceps cristatus;

- 5,200 Wigeon Anas penelope;
- 2,400 Teal Anas crecca;
- 150 Shoveler;
- 3,300 Oystercatcher Haematopus ostralegus;
- 390 Black-tailed Godwit;
- 1,900 Curlew Numenius arquata;
- 17 Spotted Redshank;
- 12 Greenshank; and
- 630 Turnstone.

2.39 The site also qualifies under Article 4.2 by regularly supporting, in summer, a diverse assemblage of breeding migratory waterfowl including:

- Oystercatcher;
- Lapwing;
- Ringed Plover;
- Redshank;
- Shelduck;
- Mallard;
- Teal;
- Shoveler;
- Pochard; and
- Common Tern Sterna hirundo.

2.40 The site also qualifies under Article 4.2 by virtue of regularly supporting, in winter, a diverse assemblage of wintering species, including:

- Red-throated Diver Gavia stellata;
- Great Crested Grebe;
- Cormorant Phalacrocorax carbo;
- Shelduck;
- Mallard;
- Teal;
- Shoveler;
- Pochard;
- Oystercatcher;
- Ringed Plover;
- Dunlin;
- Redshank;
- Bewick's Swan Cygnus columbianus;
- Hen Harrier;
- Merlin Falco columbarius ;
- Golden Plover;
- Short-eared Owl Asio flammeus; and

- Kingfisher Alcedo atthis.

2.41 The JNCC SPA review, although having no legal standing, also includes information on the Medway Estuary and Marshes SPA and lists the qualifying features as:

2.42 This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

2.43 During the breeding season:

- Avocet, 28 pairs (5-year peak mean 1988-1992); and
- Little Tern, 28 pairs (5 year peak mean, 1991-1995).

2.44 Over-winter:

- Avocet, 314 individuals (5 year peak mean 1991/92-1995/96).

2.45 This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

2.46 On passage:

- Ringed Plover, 1,337 individuals (5 year peak mean 1991/2 - 1995/6).

2.47 Over winter:

- Black-tailed Godwit, 957 individuals (5 year peak mean 1991/2 - 1995/6);
- Dark-bellied Brent Goose, 3,205 individuals (5 year peak mean 1991/2 - 1995/6);
- Dunlin, 25,936 individuals (5 year peak mean 1991/2 - 1995/6);
- Grey Plover, 3,406 individuals (5 year peak mean 1991/2 - 1995/6);
- Pintail, 697 individuals (5 year peak mean 1991/2 - 1995/6);
- Redshank, 3,690 individuals (5 year peak mean 1991/2 - 1995/6);
- Ringed Plover, 768 individuals (5 year peak mean 1991/2 - 1995/6); and
- Shelduck, 4,465 individuals (5 year peak mean 1991/2 - 1995/6).

2.48 The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.

2.49 Over winter, the area regularly supports 65,274 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Little Grebe, Dark-bellied Brent Goose, Shelduck, Pintail, Ringed Plover, Grey Plover, Dunlin, Avocet, Redshank, Curlew, Great Crested Grebe, Cormorant, Wigeon, Teal, Oystercatcher, Lapwing, Black-tailed Godwit, Whimbrel.

2.50 The Standard Natura 2000 Data Form (December 2015) provides further details of the status of the Qualifying Interest Features of the SPA.

Medway Estuary and Marshes SPA Conservation Objectives

2.51 The Conservation Objectives for the SPA were revised and published by Natural England on 21st February 2019 and are as follows:

"With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change:

- Ensure that the integrity of the site is maintained or restored as appropriate and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;
  - the extent and distribution of the habitats of the qualifying features;
  - the structure and function of the habitats of the qualifying features;
  - the supporting processes on which the habitats of the qualifying features rely;

  - the population of each of the qualifying features; and
  - the distribution of the qualifying features within the site.

2.52 The qualifying features of the SPA are listed as:

- Dark-bellied Brent Goose (Non-breeding);
- Shelduck (Non-breeding);
- Pintail (Non-breeding);
- Avocet (Breeding);
- Avocet (Non-breeding);
- Ringed Plover (Non-breeding);
- Grey Plover (Non-breeding);
- Knot (Non-breeding);
- Dunlin (Non-breeding);
- Redshank (Non-breeding);
- Little Tern (Breeding);
- waterbird assemblage; and
- breeding bird assemblage.

Medway Estuary and Marshes Ramsar

2.53 The site qualifies under the following Ramsar criteria:

2.54 Criterion 5 – Assemblages of international importance

- Species with peak counts in winter: 47,637 waterfowl (5 year peak mean 1998/99-2002/03).

2.55 Criterion 6 – Species/populations occurring at levels of international importance

- Species with peak counts in spring/autumn:
  - Grey Plover, 3,103 individuals (5 year peak mean 1998/9-2002/3); and
  - Redshank, 3,709 individuals (5 year peak mean 1998/9-2002/3).
- Species with peak counts in winter:
  - Dark-bellied Brent Goose, 2,575 individuals (5 year peak mean 1998/9-2002/3);
  - Shelduck, 2,627 individuals (5 year peak mean 1998/9-2002/3);
  - Pintail, 1,118 individuals (5 year peak mean 1998/9-2002/3);
  - Ringed Plover, 540 individuals (5 year peak mean 1998/9-2002/3);
  - Knot, 3,021 individuals (5 year peak mean 1998/9-2002/3); and
  - Dunlin, 8,263 individuals (5 year peak mean 1998/9-2002/3).

2.56 Criterion 6 – Species/populations identified subsequent to designation for possible future consideration:

- Species with peak counts in spring/autumn:
  - Black-tailed Godwit, 721 individuals (5 year peak mean 1998/9-2002/3).

2.57 The following species are listed as ‘noteworthy fauna’ on the citation - species currently occurring at levels of national importance:

- Species regularly supported during the breeding season:

  - Mediterranean Gull Larus melanocephalus, 10 apparently occupied nests (Seabird 2000 Census);
  - Black-headed Gull Chroicocephalus ridibundus, 7,050 apparently occupied nests (Seabird 2000 Census);
  - Sandwich Tern Thalasseus sandvicensis, 333 apparently occupied nests (Seabird 2000 Census);
  - Common Tern, 228 apparently occupied nests (Seabird 2000 census); and
  - Little Tern, 28 pairs (5 year mean 1991-95).
- Species with peak counts in spring/autumn:
  - Cormorant, 271 individuals (5 year peak mean 1998/9-2002/3);
  - Little Egret, 125 individuals (5 year peak mean 1998/9-2002/3);
  - Avocet, 645 individuals, (5 year peak mean 1998/9-2002/3);
  - Whimbrel, 49 individuals (5 year peak mean 1998/9-2002/3);
  - Curlew, 3,575 individuals (5 year peak mean 1998/9-2002/3);
  - Greenshank, 68 individuals (5 year peak mean 1998/9-2002/3); and
  - Turnstone, 600 individuals (5 year peak mean 1998/9-2002/3).
- Species with peak counts in winter:
  - Shoveler, 241 individuals (5 year peak mean 1998/9-2002/3);
  - Oystercatcher, 3,632 individuals (5 year peak mean 1998/9-2002/3); and
  - Golden Plover Pluvialis apricaria, 4,500 individuals (5 year peak mean 1998/9-2002/3).

Medway Estuary and Marshes Site of Special Scientific Interest

2.58 The notification for the Medway Estuary and Marshes SSSI states:

2.59 ‘The Medway Estuary and Marshes form the largest area of intertidal habitats which have been identified as of value for nature conservation in Kent and are representative of the estuarine habitats found on the North Kent coast.

2.60 The Medway Estuary is now believed to be the most important area in North Kent for wintering wildfowl with Shelduck, Brent Goose, Grey Plover, Ringed Plover, Pintail, Dunlin and Redshank occurring in numbers of international significance. Also present in numbers of national significance are Turnstone, Black-tailed Godwit, Curlew, Great Crested Grebe, Shoveler, Teal, Wigeon and White-fronted Goose. Passage migrants include Ruff, Whimbrel and Avocet.

2.61 The Chetney Peninsula is among the most important wildfowl breeding areas in Kent. Breeding species include Avocet, Shelduck, Shoveler, Pochard, Mute Swan, Tufted Duck, Teal and Gadwall.’

3. Methods

Field Survey

3.1 The intertidal surveys commenced in January 2018 and finished in December 2018, with four intertidal surveys undertaken per month; two over high tide and two over low tide. Where possible, a high water count was then followed on the same day by a low water count (or vice versa). A total of 48 surveys were conducted within the survey period, with 24 low water and 24 high water counts covering a range of tidal heights and times.

3.2 The survey dates / times, weather conditions and tidal details are presented in Table 3.1.

Table 3.1 Intertidal bird survey dates, tide times, tide heights and weather conditions

Date	High/low tide	Tide height (m)	Tide time	Weather conditions
22/01/2018	Low	0.82	09:39	9°C, cloud 6/8, wind F2W.
22/01/2018	High	5.46	15:49	9°C, cloud 4/8, wind F2W.
21/02/2018	Low	0.76	09:52	5°C, cloud 7/8, wind F3NW.
21/02/2018	High	5.51	16:05	6°C, cloud 8/8, wind F3NW.
26/02/2018	High	5.06	08:43	-1°C, cloud 3/8, wind F5E.
26/02/2018	Low	1.27	15:08	0°C, cloud 5/8, wind F5E.
06/03/2018	Low	0.45	09:35	6°C, cloud 4/8, wind F2SW.
06/03/2018	High	5.75	15:34	8°C, cloud 2/8, wind F2SE.
13/03/2018	High	4.77	09:54	7°C, cloud 8/8, wind F2W.
13/03/2018	Low	1.47	15:53	9°C, cloud 8/8, wind F2W.
18/04/2018	Low	0.47	09:10	16°C, cloud 1/8, wind F1S.
18/04/2018	High	5.96	15:06	20°C, cloud 0/8, wind F2SE.
25/04/2018	High	5.18	09:23	11°C, cloud 4/8, wind F3SW.
25/04/2018	Low	1.38	15:37	14°C, cloud 7/8, wind F3SW.
17/05/2018	Low	0.52	08:48	11°C, cloud 4/8, wind F3NW.
17/05/2018	High	5.97	14:46	14°C, cloud 1/8, wind F3NW,
23/05/2018	Low	1.41	13:54	16°C, cloud 8/8, wind F3NE.
24/05/2018	High	5.3	09:02	16°C, cloud 7/8, wind F3NE.
14/06/2018	Low	0.62	07:43	16°C, cloud 8/8, wind F5SW.
14/06/2018	High	5.94	13:46	18°C, cloud 6/8, wind F5SW.
22/06/2018	High	5.32	08:32	19°C, cloud 2/8, wind F2NW.
22/06/2018	Low	1.41	14:32	21°C, cloud 1/8, wind F2N.
13/07/2018	Low	0.71	07:26	17°C, cloud 8/8, wind F2NW
13/07/2018	High	5.89	13:30	23°C, cloud 3/8, wind F2NW.
23/07/2018	High	5.05	10:04	22°C, cloud 0/8, wind F1SW.
23/07/2018	Low	1.49	16:06	29°C, cloud 0/8, F1SW.
14/08/2018	Low	0.68	09:36	20°C, cloud 8/8, wind F2NW.
14/08/2018	High	6.1	15:34	24°C, cloud 8/8, wind F2NW.
21/08/2018	High	4.77	09:18	20°C, cloud 6/8, wind F1SW.
21/082018	Low	1.67	15:29	23°C, cloud 3/8, wind F1SW.
11/09/2018	Low	0.69	08:33	20°C, cloud 1/8, wind F4SW.

Date	High/low tide	Tide height (m)	Tide time	Weather conditions
11/09/2018	High	6.13	14:30	22°C, cloud 5/8, wind F4SW.
19/09/2018	High	4.58	08:23	19°C, cloud 7/8, wind F4SW.
19/09/2018	Low	1.81	14:45	22°C, cloud 7/8, wind F8SW.
11/10/2018	Low	0.71	08:47	18°C, cloud 1/8, wind F4SE.
11/10/2018	High	6.09	14:45	21°C, cloud 1/8, wind F4S.
19/10/2018	High	4.5	08:52	12°C, cloud 1/8, wind F2N.
19/10/2018	Low	1.69	15:31	15°C, cloud 3/8, wind F2N.
12/11/2018	Low	1.02	08:59	15°C, cloud 1/8, wind F2S.
12/11/2018	High	5.51	15:13	15°C, cloud 1/8, wind F2S.
19/11/2018	High	4.92	09:14	9°C, cloud 2/8, wind F2E.
19/11/2018	Low	1.23	15:38	9°C, cloud 2/8, wind F2E.
03/12/2018	High	5.25	09:00	13°C, cloud 6/8, wind F3-4W.
03/12/2018	Low	0.86	15:33	13°C, cloud 6/8, wind F3-4W.
11/12/2018	Low	0.93	08:40	9°C, cloud 2/8, wind F2NE.
11/12/2018	High	5.48	14:53	9°C, cloud 2/8, wind F2NE.

3.3 The survey was undertaken from suitable vantage points to observe all birds without causing undue disturbance. During the survey, one experienced ornithologist, equipped with binoculars and telescope of appropriate magnification recorded and mapped all waterbird species within the survey area. As the site is a linear area with good visibility, birds could be observed from distance to avoid disturbance and to ensure that if any moved they were not double-counted. Surveys were undertaken in the period of two hours prior to high / low water and two hours after.

3.4 All waterbird species and numbers were recorded, along with bird activity (e.g. feeding, loafing and movements). The location and extent of flocks and individual waterbirds were recorded directly into ESRI Arcpad GIS Software on handheld PDA devices, with a 1:10,000 scale Ordnance Survey base map of the study area (and adjacent land). A 50 m x 50 m grid was overlaid on top of the base map to assist with the distributional analysis. The distance from the recorder to a bird flock was assessed through the use of this grid and through the use of landmarks present in the landscape and on the base map, which could be scaled as desired in the field. Birds were either plotted as individual counts at a location or as a flock, the extent of which could be plotted electronically directly onto the base map on the hand held PDAs. The ornithologists were proficient in the use of this method and equipment having undertaken such surveys on numerous occasions previously around the UK on coastal, estuarine and inland terrestrial and wetland sites. This is a robust and reliable method for recording birds and plotting their distribution.

3.5 On returning to the office the collected data, contained on flash memory cards, were downloaded into ESRI ArcGIS software and spatial distribution maps produced.

Wetland Bird Survey (WeBS) Data

3.6 The Wetland Bird Survey (WeBS) is a joint scheme run by the British Trust for Ornithology (BTO), the Wildfowl & Wetlands Trust (WWT), Royal Society for the Protection of Birds (RSPB) and Joint Nature Conservation Committee (JNCC) to monitor non-breeding waterbirds in the UK. The scheme aims to identify population sizes, to determine trends in numbers and distribution, and to identify important sites for waterbirds. Monthly coordinated ‘core’ counts are made during high tide periods, principally from September to March.

3.7 Given, that the populations presented in the designated sites citations are based on data from approaching twenty years old, it is appropriate to consider these cited populations in the context of up to date population information, where available. Current trends, based on the most recent species and assemblage five year

peak means, as presented by WeBS, are considered in relation to species cited on the relevant SPA and Ramsar designations.

3.8 Current WeBS data in the context of the wider area were evaluated to support the results of the field surveys undertaken by AECOM.

Definitions

3.9 The definition of waterbirds used in this study is in accordance with the Ramsar convention upon which the SPA citations are based, i.e. "birds ecologically dependent on wetlands". At the broad level of taxonomic order this is as follows:

- **divers**: *Gaviiformes*;
- **grebes**: *Podicipediformes*;
- **cormorants**: *Pelecaniformes*;
- **herons**, bitterns, storks, ibises and spoonbills: *Ciconiiformes*;
- **swans**, **geese** and **ducks** (wildfowl): *Anseriformes*;
- wetland related **raptors**: *Accipitriformes* and *Falconiformes*;
- wetland related cranes, rails and allies: *Gruiformes*;
- **waders** (or shorebirds), **gulls**, and **terns**: *Charadriiformes*; and
- wetland related owls: *Strigiformes*;

3.10 For the purposes of this analysis, the term ‘spring’ is used to indicate the period April to June; ‘autumn’ to indicate the period of July to October and ‘winter’ includes the data collected in January to March 2018 and November-December 2018.

3.11 For the purposes of the analysis, the tidal cycle is divided into two periods. The term ‘low tide’ is used to indicate the period two hours either side of low tide, ‘high tide’ the period two hours either side of high tide.

Survey Limitations

3.12 Within this assessment, data has been collected during the latter period of winter 2017/2018 and early period of winter 2018/2019. A standard survey and analysis of waterbirds over the winter period would encompass November to March of a single winter but, due to the Proposed Development programme, these surveys commenced in January 2018. However, the weather in the early winter period (January- March) of 2018 was similar to that in the late period (November-December) of 2018. Therefore, these data collected from a spli’ winter in a calendar, rather than biological year are representative of a typical winter period.

3.13 The majority of ecological data is valid only for short periods due to the inherently transient nature of the subject (CIEEM, 2019[1]). On this basis, it is recommended that the surveys for intertidal waterbirds will need repeating in two years (i.e. in 2020 - 2021).

[1] CIEEM: Advice Note on the lifespan of ecological surveys and reports https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf (Accessed May 2019)

4. Results

Abundance of Waterbirds

4.1 A total of 24 waterbird species were recorded using the intertidal survey area between January 2018 and December 2018. Table 5.1 summarises the peak counts by month for each species recorded during the survey period.

Table 4.1 Peak counts of all waterbird species recorded during the surveys of the Site in 2018.

Species	Winter			Spring			Autumn				Winter		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	PEAK COUNT
Dark-bellied Brent Goose	0	38	22	0	0	0	0	0	0	9	240	0	**240**
Shelduck	20	4	4	11	1	2	0	0	0	0	0	2	**20**
Cormorant	1	0	0	0	0	0	0	0	0	0	0	0	**1**
Little Egret	0	0	0	0	0	0	1	1	1	0	0	0	**1**
Grey Heron	0	0	0	0	0	0	0	0	1	0	0	0	**1**
Oystercatcher	385	440	400	422	320	220	180	310	120	210	300	250	**440**
Grey Plover	0	0	0	0	0	0	0	4	0	24	1	0	**24**
Golden Plover	0	1	0	0	0	0	0	0	0	0	0	0	**1**
Ringed Plover	0	0	0	2	14	2	0	0	0	2	0	0	**14**
Lapwing	0	1	0	0	0	0	0	0	0	0	0	0	**1**
Whimbrel	0	0	0	1	0	0	0	0	0	0	0	0	**1**
Curlew	42	22	25	10	0	0	11	6	18	23	23	37	**42**
Black-tailed Godwit	0	0	0	0	0	0	0	38	8	38	120	0	**120**
Bar-tailed Godwit	0	0	0	0	0	0	0	1	0	0	0	0	**1**
Turnstone	0	5	0	0	0	0	0	0	0	0	3	0	**5**
Knot	0	0	0	0	0	0	0	0	0	0	8	0	**8**
Dunlin	30	0	0	3	0	0	0	0	0	24	20	5	**30**
Redshank	11	14	2	0	0	0	1	0	0	2	1	4	**14**
Black-headed Gull	78	17	63	101	11	30	280	683	458	97	93	182	**683**
Mediterranean Gull	0	0	0	2	0	0	0	0	0	0	0	0	**2**
Common Gull	0	1	2	0	0	0	0	0	0	0	0	4	**4**
Lesser Black-backed Gull	0	0	0	2	0	0	0	0	0	0	0	0	**2**
Herring Gull	6	4	11	2	5	0	3	12	3	7	7	8	**12**
Great Black-backed Gull	1	0	0	0	0	0	0	0	0	1	0	0	**1**
Peak Visit Count'	**435**	**448**	**414**	**430**	**320**	**220**	**462**	**1,009**	**461**	**297**	**688**	**314**	**1,009**
Total Assemblage²	**574**	**547**	**529**	**556**	**351**	**254**	**476**	**1,055**	**609**	**437**	**816**	**492**	**1,668**

Notes on Table 5.2: ' = The peak visit count represents the greatest number of waterbirds recorded on a single visit. ² = The total assemblage is the sum of the species peak counts

4.2 The non-breeding waterbird assemblage recorded during the survey period was determined by the summation of each species' peak count, irrespective of the survey in which they occurred. This represents the minimum number of individual waterbirds using the survey area during the monitoring period.

4.3 Therefore, the non-breeding waterbird assemblage for the survey area is 1,668 individuals. The peak seasonal waterbird assemblages (i.e. the sum of the peak counts per season), as recorded by the monitoring in 2018, were as follows (see also Table 6.1):

- Winter: 1,121 individuals;
- Spring: 571 individuals; and
- Autumn: 1,131 individuals.

Spatial and Temporal Distribution of Waterbirds

4.4 The species for which detailed accounts are given were recorded on the intertidal area of the Proposed Development Site during surveys in 2018 and meet one of the following three criteria:

- a waterbird species cited as a qualifying interest feature (in any season) of either the Thames Estuary and Marshes SPA or Medway Estuary and Marshes SPA (using the legal list of qualifying species for each site). These species are: Dark-bellied Brent Goose, Shelduck, Cormorant, Oystercatcher, Grey Plover, Golden Plover, Ringed Plover, Lapwing, Curlew, Black-tailed Godwit, Turnstone, Knot, Dunlin and Redshank;
- a waterbird species cited as a qualifying interest feature (in any season) of either the Thames Estuary and Marshes Ramsar or Medway Estuary and Marshes Ramsar. These species are: Dark-bellied Brent Goose, Shelduck, Cormorant, Little Egret, Oystercatcher, Grey Plover, Golden Plover, Ringed Plover, Whimbrel, Curlew, Black-tailed Godwit, Turnstone, Knot, Dunlin, Redshank, Black-headed Gull and Mediterranean Gull;
- a waterbird species noted on the designation for the South Thames Estuary and Marshes SSSI or Medway Estuary and Marshes SSSI (as mentioned in Section 3 of this report). These species are: Redshank, Knot, Dunlin, Ringed Plover, Shelduck, Dark-bellied Brent Goose, Grey Plover, Turnstone, Black-tailed Godwit, Curlew and Whimbrel; or
- a waterbird species that is considered partly or wholly ecologically dependent upon the intertidal habitat where their numbers exceeded a peak of 25 birds on Site. However, the peak count of species that are not already mentioned as a qualifying interest feature of an SPA or Ramsar (above), exceeded a peak of 25 birds and therefore there are no additional species.

4.5 Spatial distribution figures for these selected species are presented for both high and low water periods (see Appendix A). These maps have been plotted using the raw species counts occurring in each of the grid squares from the surveys. Therefore they do not represent a total of individuals across the site but the peak usage of each 50 m x 50 m grid square by the target species. The maps show the spatial distribution of the individual target species. They are expected to highlight those areas that are important to the target species over the low and high water periods.

4.6 Brief summary text is provided below that presents a commentary on the temporal and spatial distributions of waterbirds, highlighting the key points from the available data for each species.

Dark-bellied Brent Goose

4.7 In winter, birds were widely distributed across the survey area at high tide, ahead of the incoming tide. At low tide, the majority of records of Dark-bellied Brent Goose were in the north and south of the survey area.

4.8 This species was not recorded within the survey area in spring and the sole autumn record was of nine birds recorded over the high water period on 19th October 2018.

Shelduck

4.9 Shelduck was not recorded during surveys over the high water period in any of the seasons.

4.10 At low tide, there were no observations of Shelduck in spring and birds were widely distributed across the survey area in autumn and winter.

Cormorant

4.11 This species was only recorded on a single occasion at low tide in winter.

Little Egret

4.12 Only recorded in autumn, at both high and low tide, on exposed mud within the survey area.

Oystercatcher

4.13 Oystercatcher was recorded in all months of the survey period, with a peak count of 440 individuals over the high water on 26th February 2018.

4.14 The species was recorded across both high and low water periods within the survey area and although widely distributed across the area during both tidal states, higher concentrations of birds were recorded to the north of the survey area at high tide, at the Mean High Water Spring (MHWS) mark within the Ministry of Defence (MoD) land, approximately 200 metres north of the Proposed Development area.

Grey Plover

4.15 Grey Plover was not recorded during surveys in spring and was only recorded on a single occasion at low tide in winter.

4.16 In autumn, at low tide, birds were widely distributed across the survey area. At high tide, birds were observed at the MHWS mark, north of the Proposed Development area.

Golden Plover

4.17 A single Golden Plover was recorded sheltering in high winds on a small patch of grass near the car park at Grain.

Ringed Plover

4.18 This species favoured the sandy areas of the MHWS mark, north of the Proposed Development area, with birds recorded over the high and low water tidal states in spring and during the high tidal state on a single occasion in autumn.

Lapwing

4.19 A single Lapwing was recorded with a Golden Plover, sheltering in high winds on a small patch of grass near the car park at Grain.

Whimbrel

4.20 The species was recorded in spring only. At high tide, a single bird was recorded at the MHWS mark to the north of the survey area within the Ministry of Defence (MoD) land, c. 200 metres north of the Proposed Development area. At low tide, a single bird was foraging on the exposed mud within the survey area.

Curlew

4.21 Curlew was recorded in all seasons.

4.22 At high tide, higher concentrations of birds were recorded at the MHWS mark within the Ministry of Defence (MoD) land, c. 200 metres north of the Proposed Development area and outside the survey area, c. 700 m from the Proposed Development area.

4.23 At low tide, birds were widely distributed across the survey area.

Black-tailed Godwit

4.24 Not recorded in spring, or the early winter period.

4.25 In winter, 120 birds were recorded at the MHWS mark to the north of the Proposed Development area on 19th November 2018.

4.26 Low tide distribution within the survey area in autumn was sporadic, whilst in winter, birds favoured the southern end of the survey area.

Bar-tailed Godwit

4.27 A single Bar-tailed Godwit was recorded foraging on exposed mud during low tide on 21st August 2018.

Turnstone

4.28 Turnstone was recorded at high tide in winter only, along the MHWS mark to the north of the Proposed Development and outside the survey area (c. 700 m from the Proposed Development area).

Knot

4.29 Knot was recorded at high tide, in winter only, along the MHWS mark to the north of the Proposed Development area.

Dunlin

4.30 Dunlin was recorded sporadically over the survey area at low tide, in all seasons.

4.31 At high tide, higher concentrations of Dunlin were recorded along the MHWS mark to the north of the Proposed Development area.

Redshank

4.32 Not recorded in spring and in autumn, just 1-2 birds were recorded over both high and low water.

4.33 In winter, records at high tide were mostly of birds recorded at the MHWS mark, north of the Proposed Development area. At low tide, high concentrations of birds were recorded in the creek in the southern end of the survey area, near Grain village.

Black-headed Gull

4.34 This species was widely distributed across the intertidal mudflats at high tide and at low water.

Mediterranean Gull

4.35 Two birds were recorded at low tide, loosely associating with Black-headed Gulls on the exposed mud within the survey area.

WeBS Core Count Data for the Thames Estuary and Medway Estuary

4.36 The most recent WeBS core count data available (2012/13 – 2016/17) were reviewed for both the Thames Estuary and Medway Estuary (see Table 4.2). These data provide the most up to date populations for waterbirds on the majority of these estuaries although it is important to note that the count sector boundaries do not match exactly the boundaries of the designated sites. It should also be noted that there are a number of count sectors within the Thames Estuary and Medway Estuary which have not been subject to counts in the five year period considered here (2012/13-2016/17), so the 5 year peak means presented here are considered incomplete.

Table 4.2 WeBS Core Count data (2012/13-2016/17) for waterbird species cited on the Thames Estuary and Marshes Ramsar / SPA or Medway Estuary and Marshes Ramsar / SPA

	Thames Estuary 5 year peak mean 2012/13 – 2016/17 (taken from WeBS)	Medway Estuary (5 year peak mean 2012/13-2016/17 – taken from WeBS)
Dark-bellied Brent Goose	17,021	1,688
Shelduck	1,736	2,000
Cormorant	223	31
Little Egret	325	163
Oystercatcher	18,816	1,807
Grey Plover	4,227	236
Golden Plover	3,420	1,725
Ringed Plover	823	187
Lapwing	12,025	5,741
Whimbrel	34	13
Curlew	3,840	729
Black-tailed Godwit	7,023	2,122
Turnstone	578	244
Knot	28,881	1,330
Dunlin	32,063	5,510
Redshank	2,935	1,066
Black-headed Gull	8,376	1,120
Mediterranean Gull	39	468

5. Evaluation

5.1 Given the location of the Site and its proximity to designated sites of international importance, it is appropriate to consider the importance of the Site to birds recorded in the survey area in the context of the waterbird assemblages of these designated sites.

5.2 Table 6.1 summarises the maximum counts recorded for key species as established in section 6.1 of this report. Data are also provided for the International and Great Britain 1% threshold criteria (used to assess the importance of wetlands) and the Ramsar citation.

Table 5.1 Comparison of peak waterbird counts recorded during surveys in 2018 with original Thames Estuary SPA citation figures; alongside Ramsar citation and current 1% thresholds for national and international importance.Main text

	Peak Spring Count	% of SPA Citation Population	Peak Autumn Count	% of SPA Citation Population	Peak Winter Count	% of SPA Citation Population	Thames Estuary and Marshes Ramsar Citation	Great Britain 1% Wintering Threshold	International 1% Threshold
Dark-bellied Brent Goose	22	-	9	-	240	-	-	980	2,400
Shelduck	11	-	0	-	20	-	-	470	3,000
Cormorant	0	-	0	-	1	-	-	620	1,200
Little Egret	0	-	1	-	0	-	54	110	1,300
Oystercatcher	422	-	310	-	440	-	-	2,900	8,200
Grey Plover	0	0.00	24	0.92	1	0.04	1,643	330	2,500
Golden Plover	0	-	0	-	1	-	-	4,000	1,700
Ringed Plover	14	1.06	2	0.15	0	0.00	595	420	730
Lapwing	0	-	0	-	1	-	-	6,200	72,300
Whimbrel	1	-	0	-	0	-	-	1*	6,700
Curlew	25	-	23	-	42	-	-	1,200	8,400
Black-tailed Godwit	0	0.00	38	2.24	120	7.06	1,640	390	610
Turnstone	0	-	0	-	5	-	-	400	1,400
Knot	0	0.00	0	0.00	8	0.17	7,279	2,600	4,500
Dunlin	3	0.01	24	0.08	30	0.10	15,171	3,400	13,300
Redshank	2	0.06	2	0.06	14	0.43	1,178	940	2,400
Black-headed Gull	101	-	683	-	182	-	-	22,000	20,000
Mediterranean Gull	2	-	0	-	0	-	-	40	770

Notes on Table 5.1 – * when the 1% threshold is below 50 birds, 50 is normally used as the minimum qualifying threshold for the designation of sites of importance (Stroud, 2001) The UK SPA Network: its scope and context. JNCC; Citation species are presented in italics

Table 5.2 Comparison of peak waterbird counts recorded during surveys in 2018, with original Medway Estuary SPA citation figures; alongside Ramsar citation and current 1% thresholds for national and international importance.

	Peak Spring Count	% of SPA Citation Population	Peak Autumn Count	% of SPA Citation Population	Peak Winter Count	% of SPA Citation Population	Medway Estuary and Marshes Ramsar Citation	Great Britain 1% Wintering Threshold	International 1% Threshold
Dark-bellied Brent Goose	22	0.53	9	0.22	240	5.81	2,575	980	2,400
Shelduck	11	0.19	0	0.00	20	0.39	2,627	470	3,000
Cormorant	0	0.00	0	0.00	1	?	271	620	1,200
Little Egret	0	-	1	-	0	-	125	110	1,300
Oystercatcher	422	12.8	310	9.39	440	13.33	3,632	2,900	8,200
Grey Plover	0	0.00	24	0.50	1	0.02	3,103	330	2,500
Golden Plover	0	0.00	0	0.00	1	?	4,500	4,000	1,700
Ringed Plover	14	1.89	2	0.27	0	0.00	540	420	730
Lapwing	0	-	0	-	1	-	-	6,200	72,300
Whimbrel	1	-	0	-	0	-	49	1*	6,700
Curlew	25	1.32	23	1.21	42	2.21	3,575	1,200	8,400
Black-tailed Godwit	0	0.00	38	9.74	120	30.8	721	390	610
Turnstone	0	0.00	0	0.00	5	0.79	600	400	1,400
Knot	0	0.00	0	0.00	8	0.22	3,021	2,600	4,500
Dunlin	3	0.01	24	0.10	30	0.13	8,263	3,400	13,300
Redshank	2	0.05	2	0.05	14	0.33	3,709	940	2,400
Black-headed Gull	101	-	683	-	182	-	7,050*	22,000	20,000
Mediterranean Gull	2	-	0	-	0	-	10*	40	770

Notes on Table 5.2 – when the 1% threshold is below 50 birds, 50 is normally used as the minimum qualifying threshold for the designation of sites of importance (Stroud, 2001) The UK SPA Network: its scope and context. JNCC. *=Apparently Occupied Nests (A.O.N)

The importance of the survey area as a discrete wetland for supporting internationally and nationally important waterbird populations

5.3 No waterbird species recorded within the survey area in 2018 represented 1% or more of the international or national population estimates used for assessing populations.

The importance to birds of the survey area in the context of the Thames Estuary and Marshes Ramsar and SPA

5.4 The peak number of the following species recorded in the survey area during the monitoring period equated to over 5% of the Thames Estuary and Marshes Ramsar and SPA populations:

- Black-tailed Godwit:
  - Winter 7.1 % of the cited SPA population and 7.3 % of the cited Ramsar population.

5.5 The following two species recorded in the survey area during the monitoring period had peak counts that represented 1% or more of the Thames Estuary and Marshes Ramsar and SPA populations:

- Ringed Plover:
  - Spring 1.1 % of the cited SPA population and 1.7 % of the cited Ramsar population.
- Black-tailed Godwit:
  - Autumn 2.2 % of the cited SPA population and 2.3 % of the cited Ramsar population.

WeBS core counts for the Thames Estuary

5.6 The numbers of waterbirds recorded during the intertidal surveys in 2018 were evaluated against WeBS Core Count data for the Thames Estuary between 2012/13 and 2016/17. The peak count of Black-tailed Godwit within the survey area in 2018 equates to over 1 % of the Thames Estuary and Marshes Ramsar and SPA population (based on the five year peak mean 2012/13 - 2016/17, taken from WeBS):

- Black-tailed Godwit:
  - Winter 1.7 %.

The importance to birds of the survey area in the context of the Medway Estuary and Marshes Ramsar and SPA

5.7 The peak number of the following species recorded in the survey area during the monitoring period equated to over 5% of the Medway Estuary and Marshes Ramsar and SPA populations:

- Dark-bellied Brent Goose:
  - Winter 5.8 % of the cited SPA population and 9.3 % of the cited Ramsar population.
- Oystercatcher:
  - Spring 12.8 % of the cited SPA population and 11.6 % of the cited Ramsar population.
  - Autumn 9.4 % of the cited SPA population and 8.5 % of the cited Ramsar population.
  - Winter 13. 3 % of the cited SPA population and 12.1 % of the cited Ramsar population.
- Black-tailed Godwit:
  - Autumn 9.7 % of the cited SPA population and 5.3 % of the cited Ramsar population.

  - Winter 30.8 % of the cited SPA population and 16.6 % of the cited Ramsar population.

5.8 The following two species recorded in the survey area during the monitoring period had peak counts that represented 1% or more of the Thames Estuary and Marshes Ramsar and SPA populations:

- Ringed Plover:
  - Spring 1.9% of the cited SPA population and 2.6 % of the cited Ramsar population.
- Curlew:
  - Spring 1.3% of the cited SPA population and 0.7 % of the cited Ramsar population.
  - Autumn 1.2% of the cited SPA population and 0.6 % of the cited Ramsar population.
  - Winter 2.2% of the cited SPA population and 1.2 % of the cited Ramsar population.

WeBS core counts for the Medway Estuary

5.9 The numbers of waterbirds recorded during the intertidal surveys in 2018 were evaluated against WeBS Core Count data for the Thames Estuary between 2012/13 and 2016/17. The peak counts of the following species recorded in the survey area in 2018, equates to over 1 % of the Medway Estuary and Marshes Ramsar / SPA population (based on the five year peak mean 2012/13 - 2016/17, taken from WeBS):

- Dark-bellied Brent Goose:
  - Spring 1.3%
  - Winter 14.2%.
- Shelduck:
  - Winter 1.0%.
- Cormorant:
  - Winter 3.2%
- Oystercatcher:
  - Spring 23.4%
  - Autumn 17.2%
  - Winter 24.4%
- Grey Plover:
  - Winter 10.2%.
- Ringed Plover:
  - Spring 7.5%
  - Autumn 1.1%
- Whimbrel:
  - Spring 7.7%.
- Curlew:
  - Spring 3.4%
  - Autumn 3.2%
  - Winter 5.8%
- Black-tailed Godwit:
  - Autumn 1.8%
  - Winter 5.7%

- Turnstone:
  - Winter 2.1%
- Redshank:
  - Winter 1.3%

WeBS Alerts and SPA Population Trends

5.10 The WeBS Alerts system provides a method of identifying changes in numbers of waterbirds and provides a review of the status of species on sites in the UK which are designated due to their conservation value for non-breeding waterbirds (including The Thames Estuary and Marshes SPA and Medway Estuary and Marshes SPA). Species that have undergone changes in numbers are identified, through the issue of 'alerts'. Species trends are assessed over the short-, medium-, and long-terms (5, 10 and up to 25 year respectively). Where declines exceed 50%, High-Alerts are issued and where declines lie between 25% and 50%, Medium-Alerts are issued. Considering these alerts in the context of the species recorded during AECOM surveys provides important background information on the trends of species populations and the existing pressures that the populations may already be experiencing. This is important as it could determine how sensitive the species may be the potential impacts of the scheme and the reaction of these populations to these impacts.

Thames Estuary and Marshes SPA WeBS Alerts

5.11 The WeBS Alert system evaluated 14 species for the Thames Estuary and Marshes SPA, with alerts triggered for seven species in relation to the SPA.

5.12 Of the 14 species evaluated for WeBS Alerts, eight species were recorded within the intertidal survey area and five species are included as 'alert species' for the SPA. These were: Ringed Plover, Grey Plover, Lapwing, Knot and Dunlin.

5.13 Ringed Plover, included as a WeBS Alert species, was recorded within the survey area in significant (greater than 5%) numbers in relation to the cited SPA population for the Thames Estuary and Marshes SPA.

5.14 One other species, Black-tailed Godwit, was also recorded within the survey area in significant numbers (greater than 5%) in relation to the cited SPA population for the Thames Estuary and Marshes SPA, although this species is not included as a WeBS Alert species.

5.15 Of these two species, present within the survey area in significant numbers:

- Black-tailed Godwit has increased on the SPA by 237% in the short-term, 605 % in the medium-term and 5,067 % in the long-term; and
- Ringed Plover has decreased on the SPA by 37% in the short-term and 24 % in the medium-term, but increased by 41 % in the long-term (the short-term decline triggering a Medium-Alert).

5.16 In consideration of these population changes, as indicated by WeBS Alerts, the populations of Ringed Plover on the SPA could be considered more vulnerable than Black-tailed Godwit and other waterbird species (recorded in lower numbers) to any impacts of development.

Medway Estuary and Marshes SPA WeBS 'Alerts'

5.17 The WeBS Alert system evaluated 17 species for the Medway Estuary and Marshes SPA, with alerts triggered for 12 species in relation to the SPA.

5.18 Of the 17 species evaluated for WeBS Alerts, 11 species were recorded within the intertidal survey area and nine species are included as 'alert species' for the SPA. These were Dark-bellied Brent Goose, Shelduck, Cormorant, Oystercatcher, Ringed Plover, Grey Plover, Dunlin, Curlew and Redshank. Of these 'alert' species, recorded within the survey area in 2018:

- Dark-bellied Brent Goose was recorded within the survey area in significant (>5%) numbers in winter in relation to the cited SPA population for the Medway Estuary and Marshes SPA; and

- Oystercatcher was recorded within the survey area in significant (>5%) numbers in spring, autumn and winter in relation to the cited SPA population for the Medway Estuary and Marshes SPA;
- Ringed Plover was recorded within the survey area in numbers >1% (in spring) of the cited SPA population for the Medway Estuary and Marshes SPA; and
- Curlew was recorded within the survey area in numbers >1% (in spring, autumn and winter) of the cited SPA population for the Medway Estuary and Marshes SPA.

5.19 Shelduck, Cormorant, Grey Plover, Dunlin, Curlew and Redshank were recorded within the survey area in numbers <1% of the cited SPA populations for the Medway Estuary and Marshes SPA.

5.20 In consideration of the four species (Dark-bellied Brent Goose, Oystercatcher, Ringed Plover and Curlew), present within the survey area in significant numbers:

- Dark-bellied Brent Goose has increased on the SPA by 2% in the short-term, but decreased by 39 % in the medium-term and 36 % in the long-term (the medium-term and long-term declines triggering a Medium-Alert);
- Oystercatcher ha increased on the SPA by 39 % in the short-term and 194 % in the long-term, but decreased by 32 % in the medium-term (the medium-term decline triggering a Medium-Alert);
- Ringed Plover has decreased on the SPA by 25% in the short-term, 70% in the medium-term and 88 % in the long-term (the short-term decline triggering a Medium-Alert and the medium-term and long-term declines triggering a High-Alert); and
- Curlew has decreased on the SPA by 29 % in the short-term, 61% in the medium-term and 24 % in the long-term (the short-term decline triggering a Medium-Alert and the medium term decline triggering a High-Alert).

5.21 In consideration of these population changes, as indicated by WeBS Alerts, the SPA populations of these four species could be considered vulnerable to the impacts of development, affecting the overall estuarine waterbird assemblage.

6. Conclusions and Recommendations

6.1 A total of 24 species of waterbird were recorded using the survey area in 2018. Of these, 17 species were recorded using the survey area in winter, 9 species of waterbirds were recorded using the survey area in spring and 14 species were recorded using the survey area in autumn.

6.2 A total of 18 species of waterbird, considered as being of conservation importance due to being listed as wintering and/or passage interest features of The Thames Estuary and Marshes Ramsar and SPA or the Medway Estuary and Marshes Ramsar and SPA were recorded. These species are (SPA species in italics): Dark-bellied Brent Goose, Shelduck, Cormorant, Little Egret, Oystercatcher, Grey Plover, Golden Plover, Ringed Plover, Lapwing, Whimbrel, Curlew, Black-tailed Godwit, Turnstone, Knot, Dunlin, Redshank, Black-headed Gull and Mediterranean Gull.

6.3 No peak counts of any species recorded within the survey area in 2018 represented 1% or more of the international or national population estimates.

6.4 A significant proportion (greater than 5%) of the wintering population of Black-tailed Godwit, cited on The Thames Estuary and Marshes Ramsar / SPA was recorded within the survey area in 2018. However, when evaluating the peak count of Black-tailed Godwit recorded in the survey area in 2018 against the recent five-year peak mean for the whole estuary, taken from WeBs, the peak count represents just over 1% of the population using the estuary.

6.5 The peak count of three species (Dark-bellied Brent Goose, Oystercatcher and Black-tailed Godwit) recorded during the surveys represented over 5% of the cited SPA populations for the Medway Estuary and Marshes Ramsar / SPA. When evaluating the peak count of these species recorded in the survey area in 2018 against the recent five-year peak mean for the whole estuary, taken from WeBs, the peak counts of Dark-bellied Brent Goose (in winter), Oystercatcher (all seasons) and Black-tailed Godwit (in winter) represents over 5% of the population using the estuary.

6.6 Species populations greater than 5% represent a significant proportion of the SPA population for the Thames Estuary and Marshes SPA and Medway Estuary and Marshes SPA.

6.7 When compared to the most recent WeBS core count data, the peak count of four species (not already mentioned above): Grey Plover (winter), Ringed Plover (spring), Whimbrel (spring) and Curlew (winter) were recorded in the survey area in 2018 in peak numbers equating to over 5% of the Medway Estuary and Marshes Ramsar and SPA population (based on the five year peak mean 2012/13-2016/16). For the purposes of assessment, the original species populations at the time of designation should form the basis for determining any impacts arising from a scheme and likely significant effects to key receptors, but recent WeBS data should be used to make an informed conclusion and support a proportionate decision as to any mitigation measures required.

6.8 One species, Ringed Plover, has been identified within the WeBS Alerts system as showing declines on The Thames Estuary and Marshes SPA in the short-term, which may suggest that in the absence of appropriate mitigation, they are more vulnerable to negative impacts of development.

6.9 Four species (Dark-bellied Brent Goose, Oystercatcher, Ringed Plover and Curlew) have been identified within the WeBS Alerts system as showing declines on The Medway Estuary and Marshes SPA in the short-, medium- and long-term that may suggest that in the absence of appropriate mitigation, they are more vulnerable to negative impacts of development.

6.10 Waterbird distribution was evenly distributed at low tide across the survey area. At high tide, larger concentrations of waterbirds were recorded at the MHWS mark, to the north of the Proposed Development area, where birds were recorded roosting. A second high tide roosting site was observed outside of the survey area, c .700 m north of the Proposed Development area.

6.11 Given, the above conclusions, the following recommendations should be used to reduce the likelihood of significant effects occurring on important receptors associated with the Thames Estuary and Marshes Ramsar / SPA during construction of the Proposed Development:

- The installation works in the intertidal area will be completed in as short a period as possible to further reduce disturbance to birds. Works will be undertaken at low tide when there are extensive exposed mudflats within the Project area and wider estuary, meaning that there is an extensive foraging resource available for waterbirds and they are more dispersed across the intertidal area. As a result, if temporarily disturbed from the Project area extensive, alternative foraging areas are available. The intertidal areas to the north-west, in particular, are relatively undisturbed as these areas lie offshore from military land, with no public access.
- Works will avoid high water and the periods running up to and proceeding high water (approximately 2 hours), when roosting waterbirds are concentrated to the north-west of the cable installation area. Should works be required during these sensitive periods then the CEMP will include measures to ensure a watching brief by an experienced ornithologist is in place to monitor waterbird reactions and advise on preventive measures to avoid undue disturbance.

6.12 However, to reduce the likelihood of significant effects occurring on important receptors associated with the Thames Estuary and Marshes Ramsar / SPA during construction of the Proposed Development, if construction works are to be undertaken over high water periods during winter, i.e. two hours either side of high water, then consideration should be given to how any works at the MHWS mark can be screened. In particular, movements of the work force and any noise arising from these activities. However, it is acknowledged that work undertaken at the landfall area (at the MHWS mark) are unlikely to cause disturbance to roosting waterbirds, given:

- the distance between the Proposed Development area and the identified high tide roost; and
- the curvature of the land will screen the visibility of construction from the high tide roost.

Appendix A : Distribution Maps of Waterbirds Recorded within the Survey Area in 2018