

Chapter Twelve ♦ Terrestrial and Freshwater Ecology and Biodiversity

INTRODUCTION

- 12.1 This chapter sets out a preliminary high-level assessment of the likely significant effects of the Proposed Development (as described in Chapter 5) on terrestrial and freshwater features of nature conservation value. In particular, it considers the likely effects of the Proposed Development on the Important Ecological Features (IEFs) identified within the Project Site or its potential zone of influence¹. Aquatic features in the Thames Estuary intertidal and subtidal environment are dealt with separately in Chapter 13.
- 12.2 The assessment has been prepared with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM) '*Guidelines for Ecological Impact Assessment in the UK and Ireland*' (CIEEM, 2018)², hereafter referred to as 'the EclA Guidelines'. The chapter has been prepared and reviewed by experienced senior EDP Ecologists and full members of CIEEM.
- 12.3 This chapter describes: the methods used for the assessment; a summary of the baseline conditions currently existing at the Project Site and in its surroundings; the likely direct and indirect effects arising from the Proposed Development during construction and operation; and the mitigation measures required to avoid, mitigate or compensate likely significant negative effects. It also provides an assessment of the potential opportunities to provide enhancements over the existing situation.
- 12.4 The assessment is not exhaustive, and other effects and mitigation requirements may be identified in light of on-going ecology surveys, stakeholder/public consultation and evolution of the project design.
- 12.5 For reasons of clarity, and due to the quantity of baseline ecological information collated during the assessment, the detailed methods, results and a full set of associated drawings are provided in an Ecology Baseline Report which is included as **Appendix 12.1**.

METHODOLOGY AND DATA SOURCES

- 12.6 The assessment will follow the methodology provided in the EclA Guidelines. These Guidelines confirm that the "*EclA is a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems*".

¹ Zone of Influence - the area over which ecological features may be affected by biophysical changes as a result of the proposed development

² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

Identification of the Resource/Baseline Conditions

- 12.7 This assessment is based upon a review of the data obtained from previous ecology surveys, desk-based reviews and update ecology surveys commencing in winter 2019/2020 and continuing throughout 2020, as discussed further below.
- 12.8 Collectively, findings from the above have been used to identify the important ecological features/receptors (IEFs) within the Project Site and its potential zone of influence, which are in turn being used to inform the masterplanning and mitigation strategy and form the basis for the assessment of potential effects.

Previous Ecology Assessment

- 12.9 The Kent Project Site has previously been subject to a suite of ecological baseline surveys as set out in various reports prepared in 2012 which were summarised within the 2014 EIA Scoping Report received by the Secretary of State in November 2014.
- 12.10 The 2012 reports are appended to EDP's Ecology Baseline Report (**Appendix 12.1**), and include:
- 2012 Desk Study and Phase I Habitat Survey Report (CBA, 2012);
 - 2012 Botanical Survey Report (CBA, 2012);
 - 2012 Amphibian Survey Report (CBA, 2012);
 - 2012 Breeding Birds Survey Report (CBA, 2012);
 - 2012 Terrestrial Invertebrate Survey Report (CBA, 2012);
 - 2012 Terrestrial Invertebrate Survey Supplementary Report (Spiders [Araneae] and related groups) (CBA, 2012); and
 - 2012/13 Wintering Birds Survey Report (CBA, 2013).
- 12.11 In addition, further surveys were undertaken on the Kent Project Site throughout 2015 and 2016, the findings of which are provided in full in the following reports:
- Phase 1 and Botanical Survey Report (CBA February 2016);
 - Wintering Bird Survey Report (Corylus Ecology April 2016);
 - Common Bird Survey Report (Corylus Ecology April 2016);
 - Bat Activity Report 2015 (Corylus Ecology June 2016);

- Dormouse Report (Corylus Ecology February 2016);
- 2015 Harvest Mouse Survey Report (CBA February 2016);
- 2015 Water Vole Survey Report (CBA February 2016);
- 2015 Badger Survey Report (CBA February 2016);
- 2015 Amphibian Survey Report (CBA February 2016);
- 2015 & 2016 Reptile Survey Report (CBA August 2016);
- Invertebrate Survey and Assessment of the London Paramount Entertainment Resort 2015 (Edwards Ecological Services, 2015);
- An ecological survey of the waterbodies and wetlands on and around the Swanscombe Peninsula, Kent (Aseda, 2016); and
- A targeted ecological survey of selected waterbodies and wetlands on the Swanscombe peninsula, Kent (Aseda, 2016);
- Fish survey of Swanscombe Marshes (Colclough and Coates, 2015); and
- Fish survey of the Ebbsfleet Stream (Colclough and Coates, 2015).

12.12 These reports are appended in full, and the key findings summarised, within **Appendix 12.1**.

2019/2020 Update Ecology Surveys

12.13 The update ecological information collated for the Project Site by EDP is set out in detail within **Appendix 12.1**. The appendix details the full survey methodologies that have been, or will be, employed, any findings from surveys completed and analysed to date and any limitations. It seeks to identify the Important Ecological Features (IEFs) within the Project's ecological zone of influence and defines the zone of influence for different receptors.

12.14 A summary of the update ecology surveys being undertaken across the Project Site is provided below, along with their timescales for completion:

- Desk study (April 2020);
- Extended Phase 1 Habitat Survey (May 2020);
- Botanical survey (June 2020);

- Wintering bird surveys (winter 2019/2020);
- Breeding bird surveys (April to July 2020) and passage bird surveys (April, August and September 2020)
- Bat surveys, including bat roost surveys and bat activity surveys (May to September 2020);
- Dormouse surveys (April to October 2020);
- Badger survey (May 2020);
- Water vole and otter surveys (May to August 2020);
- Harvest mouse surveys (October 2020);
- Great crested newt survey (April 2020);
- Reptile surveys (April to September 2020);
- Terrestrial invertebrate surveys, including an invertebrate scoping study (April 2020) and detailed invertebrate sampling (May to August 2020);
- Aquatic invertebrate surveys, including an invertebrate scoping study (April 2020) and detailed invertebrate sampling (May and August 2020); and
- River corridor survey and river habitat survey (May 2020).

12.15 All surveys are being undertaken with reference to best practice guidance where available. Any limitations in the survey work are detailed in **Appendix 12.1** and provided at **paragraphs 12.47 to 12.54** inclusive.

Assessment Methodology

12.16 The Assessment Methodology adopted by this Chapter follows that set out in the EclA Guidelines.

Ecological Zone of Influence or Geographical Scope (Study Area)

12.17 The Ecological Zone of Influence (EZOI) is an area defined by the assessment in which there may be receptors subject to effects as part of the Proposed Development, both those which may occur as a result of land-take and habitat loss and those which may occur through disturbance such as noise. Such receptors are likely to include designated sites, notable habitats and protected species, and these could be affected directly, e.g. construction works affecting a receptor within the Project Site such as removal of a tree

occupied by roosting bats, or indirectly, e.g. a designated site down river of a development being affected by increased storm run-off, etc.

12.18 The EZoI was determined through:

- A review of existing baseline conditions in comparison with that proposed by the Proposed Development;
- Consideration of the proposed activities (during all phases);
- Desk study information including an examination of mapping data;
- Consultation responses; and
- Findings of the survey work.

12.19 The EZoI is defined as the areas/resources that may be affected by the biophysical changes caused by activities associated with the Proposed Development. Due to the scale and nature of the proposals, the EZoI includes all land within the DCO Order Limits. In addition, the study area for the desk study extends beyond the DCO Order Limits in order to take account of potential for effects to occur within a wider geographical area.

12.20 The following desk study search radii around the Project Site were employed and are considered to be sufficient to cover the ecological zone of influence of the Proposed Development:

- International statutory designations (15km);
- National statutory designations (5km);
- Non-statutory locally designated sites (2km);
- Annex II bat species³ records (6km); and
- All other protected/ notable species records (2km).

12.21 The field surveys undertaken to inform the assessment cover the Project Site, as described in further detail in **Appendix 12.1**.

Ecology and Biodiversity Evaluation

12.22 An evaluation of Important Ecological Features (IEFs) has been made with reference to the EclA Guidelines. A summary of the evaluation approach is provided below.

³ Bat species listed in Annex II of the *EC Habitats Directive*, namely Greater horseshoe, Lesser horseshoe, Barbastelle and Bechstein's bats

12.23 The guidelines advocate an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts, who know the locality of the project and/or the distribution and status of the species or features that are being considered.

12.24 The guidelines recommend that the value or potential value of an ecological resource or feature should be determined within a defined geographical context, and the guidelines provide a geographical range ('frame of reference') that can be adapted. The geographical frame of reference used in this assessment is as follows:

- International value (SACs, SPAs, Ramsar sites);
- National value (within England), e.g. SSSIs and NNRs;
- Regional value (within south-east England);
- County value (within Kent or Essex), e.g. Local Nature Reserves, Local Wildlife Sites, ancient woodlands, atypical and diverse species assemblages with good population sizes;
- District value (within the Borough of Dartford, Borough of Gravesend or Thurrock Council), e.g. where species rich/extensive/atypical examples are present – moderate population sizes or species assemblages with moderate to high diversity;
- Local value (within Swanscombe and Greenhithe Civil Parish, Bean Civil Parish, or Southfleet Civil Parrish, or the towns of Northfleet, Gravesend or Tilbury), e.g. priority habitats or priority species⁴, and/or common and widespread species with relatively moderate populations and relatively limited diversity;
- Site value (the Project Site and immediate environs): small areas of common habitats such as species-poor grassland and scrub – common and widespread species with small populations and limited diversity; and
- Negligible value (typically applied to areas of bare open ground/built development/areas of hardstanding).

Designated Sites

12.25 Some sites have already been assigned a level of nature conservation value through designation, and the guidelines recommend that the reasons for this designation need to be taken into account in the assessment. Such designations include:

- Internationally important sites such as SACs, SPAs and Ramsar sites;

⁴ Priority habitats and species include those habitats and species which are 'of principal importance for the purpose of conserving biodiversity' under Section 41 of the Natural Environment and Rural Communities Act, 2006

- Nationally important sites such as SSSIs and NNRs; and
- Regional/County important sites such as LNRs.

12.26 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Habitats

12.27 The guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available. Where areas of a habitat or plant community do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate. It also emphasises the importance of not under-estimating habitats in sub-optimal condition where there is potential for restoration.

Species

12.28 The guidance deals with species that need to be assessed because they are of biodiversity value, rather than because they are legally protected (although some species may be legally protected as well as being of biodiversity value).

12.29 In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. The valuation of populations should make use of any relevant published evaluation criteria.

Assessment of Potential Impacts

12.30 The guidelines advocate an approach to assessing likely impacts that involves professional judgement based on available guidance and information.

12.31 The assessment of the potential impacts of the Proposed Development takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features. Impacts can be permanent/temporary, direct or indirect, positive or negative and can include:

- Direct loss of wildlife habitats;
- Fragmentation and isolation of habitats;
- Disturbance to species from noise, light or other visual stimuli;
- Changes to key habitat features; and/or
- Changes to the local hydrology, water quality and/or air quality.

12.32 The significance of a negative effect (or a positive effect) is the product of the magnitude of the impact and the value or sensitivity of the nature conservation features affected. In order to characterise the impacts on each feature, the following parameters are taken into account:

- The magnitude of the impact;
- The spatial extent over which the impact would occur;
- The temporal duration of the impact;
- Whether the impact is reversible and over what timeframe; and
- The timing and frequency of the impact.

Criteria for Assessment

12.33 There is no agreed absolute method for assessing the significance of negative or positive impacts on nature conservation features. In addition, since the purpose of an EIA is to focus on likely significant effects, it is not reasonable to expect the assessment to include every ecological feature that may be affected, since effects are unlikely to be significant where features of low (Site level or below) value or sensitivity are, for example, subject to low or short-term impacts. On this basis, the assessment therefore focuses on ecological features that are considered, based on professional judgement, experience and contextual information, to be protected and/or of Local nature conservation value or above.

12.34 However, this does not mean that effects upon features of less than Local level nature conservation value have been discounted. Certain species and habitats that may not constitute IEFs based upon their nature conservation value, may still warrant consideration during the design of the development (and any mitigation identified) on the basis of their legal protection, their implications for policies and plans, or other issues, such as animal welfare.

12.35 The guidelines also recommend that where ecosystem service provision (benefits people derive from the natural environment) might be affected as a result of a project's ecological effects, this should be recognised, and the relevant data collected during the EclA to inform separate specialist assessments of social and economic value. This can enable the social and economic implications of ecological changes to be taken into account.

12.36 The assessment identifies those positive and negative impacts which would be 'significant', based on effects that either support or undermine the conservation objectives of the ecological feature or biodiversity in general. Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent abundance and distribution)'. Such significant effects are qualified with reference to an appropriate

geographic scale and based on the best available scientific evidence. Where it is not possible to robustly justify that no significant effect will occur, a significant effect is assumed.

- 12.37 The integrity of 'designated' sites is described as follows and is taken from the Guidelines for Ecological Impact Assessment in the UK (CIEEM, 2018). It has been used in this assessment to determine whether the impacts of the Proposed Development on a designated site are likely to be significant:

"Significant effects encompass impacts on structure and function of defined sites and ecosystems. The following need to be determined:

- *for designated sites - is the project and associated activities likely to undermine the site's conservation objectives of the site, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features?"*

- 12.38 The conservation status of habitats and species within a defined geographical area is described as follows (CIEEM, 2018), and has been used in this chapter to determine whether the impacts of the Proposed Development on non-designated habitats and species are likely to be significant:

"Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- *habitats - conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area;*
- *species - conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area."*

- 12.39 On the basis of the above, and within this assessment, ecological effects are described as either:

- Significant or not significant;
- Direct and/or indirect,
- Permanent or temporary; and
- Negative or positive.

- 12.40 Mitigation measures have been taken into account during the assessment of effects, such that the residual impact assessment reflects the completed scheme. These measures include those required to achieve the minimum standard of established practice plus additional measures to further reduce the effects of the scheme. The assessment takes into account the likely success of the mitigation.
- 12.41 The significance of the likely impacts upon IEFs has been assessed both before and after consideration of additional mitigation measures. The latter represents the assessment of the residual impacts of the project.
- 12.42 In relation to EIA and assessment of significant effects, CIEEM guidance (CIEEM, 2018) highlights that:
- “A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.”*
- 12.43 In addition to determining the significance of an impact on any ecological features, this Chapter also identifies any legal requirements in relation to wildlife.

Temporal Scope

- 12.44 The assessment of potential ecological effects resulting from the Proposed Development will be undertaken in the context of how the predicted baseline conditions within the EZoI might change between the surveys and the start of construction activities. It is anticipated a phased work programme for the Proposed Development will commence in 2022, with Gate One opening in 2014, Gate Two in 2029, with full maturity being achieved by 2038.

Cumulative Effects

- 12.45 Cumulative effects generally occur where there may be simultaneous or prolonged similar effects on the same habitats or species populations as a result of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified. Where other schemes are relevant, these will be considered in conjunction with the Proposed Development.
- 12.46 Those cumulative impacts that can be foreseen as a result of the Proposed Development in conjunction with the identified schemes, and any possible mitigation measures required, will be assessed and fully reported in the ES.

Assumptions and Limitations

- 12.47 The vast majority of surveys have been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. Minor limitations specific to each of the field survey methodologies are detailed within the appropriate sections of **Appendix 12.1** and summarised below.

- 12.48 Survey work at 'Botany Marsh west' has yet to be undertaken, the outcomes of this survey work will be reported in the ES. However, surveys have been conducted on similar habitat close to, or adjacent to, these areas and so it is reasonably assumed that any species confirmed present in suitable, connected habitat are also present in these areas.
- 12.49 During the course of the environmental DNA (eDNA) surveys to confirm the presence/absence of great crested newts, access was not possible to all of the ponds and ditches on or adjacent to the Project Site. However, a large number of waterbodies were surveyed and all eDNA analysis returned a negative result (i.e. no evidence of the presence of great crested newt DNA), and there were no recent records returned during the desk study. On this basis, it is considered a fair assumption that great crested newts are unlikely to be present.
- 12.50 The lack of access to some water bodies also posed a limitation to the otter and water vole survey. However, presence of water vole within the Kent Project Site was confirmed during the first survey in June 2020, and it is assumed that water vole could utilise other parts of the ditch network due to the presence of suitable habitat. Similarly, with regard to the presence of otter, an otter was sighted within Blackduck Marsh in March 2020, and it is assumed that otters may be present in other parts of the Kent Project Site such as along the River Ebbsfleet and the ditch network due to the presence of suitable habitat.
- 12.51 Access permission has not been granted to all buildings thus far for a preliminary roost assessment for bats, and some are inaccessible due to dense scrub. Discussions with landowners to agree access permission is ongoing. In light of the current 'lockdown' and social distancing measures imposed as a result of the COVID-19 virus global pandemic, it is unlikely that internal access to buildings will be possible. In this instance, a precautionary approach to the assessment of bat roost potential will be followed based on the nature/fabric/use/location of the building using professional judgement of a bat licenced ecologist.
- 12.52 Following the first reptile survey in 2020, some of the artificial refugia in the north of the Kent Project Site were removed and damaged due to mowing activity and so this limited checks in this area during May. However, reptiles were still recorded in this area, and replacement refugia have been deployed and will remain in place for the following checks, allowing for an accurate presence/absence survey and population estimate. Furthermore, previous surveys from 2016 confirmed the presence of three species of reptile including common lizard, slow-worm and grass snake, and it is considered highly likely that these species continue to be present.
- 12.53 It should also be noted that owing to the seasonality of some species, as well as the ability for some species to quickly colonise sites (such as badger), the absence of evidence of any particular species from within the Project Site should not be taken as conclusive evidence that the species is not present or that it will not be present in the future.
- 12.54 Overall, it is considered that the results of the Phase 1 survey and additional Phase 2 surveys undertaken in 2019 and 2020 are robust and reliable for the identification of the

habitats and the presence or absence of legally protected/notable species within the Project Site, and sufficient to identify the IEFs requiring further consideration in the EclA.

Consultation

- 12.55 On 10 November 2014, the Secretary of State received a Scoping Report submitted by London Resort Company Holdings under Regulation 8 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (SI 2263) (as amended) (the EIA Regulations) in order to request a scoping opinion for the proposed London Resort ('the Project Site'). At this stage, the Project Site consisted solely of the Kent Project Site.
- 12.56 The Secretary of State provided their Scoping Opinion on the information to be provided in the Environmental Statement (ES) in December 2014. The applicant has noted the previous comments in relation to the ecology scope and seeks to address the Secretary of State's advice and recommendations (see **Table 12.1**) in the updated assessment described below.
- 12.57 In addition, a further request for a scoping opinion was submitted to the Secretary of State in June 2020. Once received, comments will be considered and used to inform the assessment going forward.

Table 12.1: Planning Inspectorate's comments from the 2014 EIA Scoping Opinion in relation to Ecology (December 2014).

Paragraph	Inspectorate's comments	Action taken
3.25	The Secretary of State recommends that surveys should be up to date and carried out in accordance with the relevant best practice guidance and accepted professional standards, including ensuring that surveys are carried out at the appropriate time of year. The Secretary of State advises that the ES should contain all of the baseline information needed for the assessment of potentially significant environmental effects.	A comprehensive suite of ecology surveys are being undertaken in accordance with best practice guidance at appropriate times of year. The proposed methodologies are provided along with this Scoping Report
3.26	The Secretary of State recommends that the proposals should address fully the needs of protecting and enhancing biodiversity. The assessment should cover habitats, species and processes within the site and its surroundings. The Secretary of State draws attention in particular, but not exclusively, to the effects on water birds and on intertidal and coastal habitats.	Consideration will be given to the protection and enhancement of biodiversity within the assessment, including (but not limited to) water birds and on intertidal and coastal habitats.

Paragraph	Inspectorate's comments	Action taken
3.27	The potential impacts on international and nationally designated sites should be addressed as well as county level habitats. The Secretary of State notes the presence of Baker's Hole SSSI within the development area, and a number of other SSSI and nationally and locally designated sites within the surrounding area. The archaeological interest of these sites should be considered within the cultural heritage topic. The geological interest of these sites may be better considered within the soils and ground conditions chapter rather than the ecology chapter.	Full consideration will be given to the potential impacts on international and nationally designed sites within the potential zone of influence of the Project Site. It is acknowledged, and agreed, that the archaeological interest of Baker's Hole SSSI should be considered in the cultural heritage topic, and that the geological interest is best considered within the soils and ground conditions chapter, rather than the ecology chapter.
3.28	The Secretary of State notes the possible need for a Habitats Regulations Assessment in view of the development site's location in relation to the Thames Estuary & Marshes SPA and Ramsar site, the Medway Estuary & Marshes SPA/Ramsar and the Swale SPA/Ramsar, and the potential impacts resulting from the development. The applicant's attention is drawn to the response from the MMO, NE, and GBC (in Appendix 2) regarding the need for this assessment, and further advice is provided in Section 4 of this Opinion.	The Applicant will provide sufficient information to the Competent Authority to enable it to carry out a Habitat Regulations Assessment (HRA) if required.

Paragraph	Inspectorate's comments	Action taken
3.29	The assessment should take account of impacts of noise and vibration, lighting, and air quality (including dust), and cross reference should be made to these specialist reports. The Secretary of State considers that the proposals would result in a significant increase in visitor pressure and associated disturbance, and this aspect is also highlighted by comments received from the EA and provided in Appendix 2 of this Opinion. Reference should be made to the design of the proposed flood defences and other proposed landscaping and drainage features across the site, and how these may impact existing habitats and the use of the area by water birds and other species of conservation concern; both negatively, and positively where opportunities to provide mitigation and enhancement for ecological features have been sought. The applicant's attention is drawn to comments received by the EA in this regard (Appendix 2).	The ecology assessment will consider both direct impacts, and also indirect impacts, such as noise, vibration, lighting, air quality (including dust), as referred to in the Inspectorate's response. To sufficiently assess the nature and significant of these potential impacts, reference will be made to specialist reports and mitigation strategies designed through inter-disciplinary collaboration.
3.30	The operational and decommissioning phases of the works should be addressed. The Secretary of State recommends the need to consider cumulative and combined impacts and advises this is particularly relevant in terms of assessing the impacts on ecology. The scope of the cumulative impact assessment should be agreed with the relevant consultees.	The ecology assessment will consider both the operational and decommissioning phases of the works. EDP shall seek to agree the scope of cumulative impacts with regards to ecology with consultees.

12.58 In addition to formal consultation on EIA scoping referred to above, consultation has been held with parties with an interest or remit in biodiversity, as shown in **Table 12.2** below.

Table 12.2 Consultation Summary

Consultee	Details
Natural England, Environment Agency, Kent County Council, Dartford Borough Council, Gravesham Borough Council, Marine Management Organisation,	Environmental Liaison Group meeting on 18 May 2020
Kent Wildlife Trust	Meeting to discuss ecological mitigation proposals on 24 June 2020 and 23 July 2020
Natural England	Email correspondence regarding terrestrial invertebrate survey methodology in late May and June 2020
Environment Agency	Email correspondence regarding aquatic invertebrate survey methodology in late May 2020, and meeting 09 July 2020 to discuss requirements for Water Framework Directive assessment and Ecological Impact Assessment
Buglife	Introductory meeting to discuss scope of invertebrate surveys, approach to evaluation, and mitigation/ compensation measures

RELEVANT LAW, POLICY AND GUIDANCE

Legislative and Policy Context

12.59 In preparing the EclA, the following Acts of Parliament and Regulations, considered of primary relevance, will be referred to:

- The Conservation of Habitats and Species Regulations 2017 (as amended), known as the 'Habitat Regulations', which implement European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (the 'Habitats Directive') and European Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive');
- Water Framework Directive (WFD) (2000/60/EC);
- Ramsar Convention on Wetlands of International Importance 1972;
- The Wildlife and Countryside Act 1981 (as amended);
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- The Countryside and Rights of Way (CROW) Act 2000;

- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act 1992; and
- The Hedgerows Regulations 1997.

Policy Framework

National Policy

National Policy Statements

12.60 National Policy Statements (NPS) set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes highways and transport infrastructure, regard will be had to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPS paragraphs 3.2 to 3.5);
- Habitats Regulations Assessment (HRA) (NPS paragraphs 4.22 to 4.25);
- Climate change adaptation (NPS paragraphs 4.36 to 4.47); and
- Biodiversity and ecological conservation (NPS paragraphs 5.20 to 5.38).

National Planning Policy Framework

12.61 Paragraph 5 of the National Planning Policy Framework⁵ (NPPF; February 2019) states:

"The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework). National policy statements form part of the overall framework of national planning policy, and may be a material consideration in preparing plans and making decisions on planning applications."

12.62 In preparing this chapter regard will be given to the relevant parts of the NPS and the NPPF, particularly during the assessment process. Relevant guidance from National Planning Practice Guidance⁶ (NPPG, updated October 2019) will also be adhered to.

⁵ Ministry of Housing, Communities and Local Government (June, 2019) 'National Planning Policy Framework'.

⁶ <https://www.gov.uk/guidance/natural-environment#biodiversity-geodiversity-and-ecosystems>

12.63 The Government's current planning policies on land use planning in England are set out in the NPPF. The following NPPF policies are relevant to consideration of terrestrial ecology and biodiversity:

- Policy 15 – Conserving and enhancing the natural environment.

National Planning Practice Guidance

12.64 Planning Practice Guidance on the natural environment supports the NPPF by explaining the government's planning policies for England, in regard to (amongst others) the protection and enhancement of biodiversity, ecosystem and green infrastructure, and how these are expected to be applied.

Local Plan Policy

12.65 The Project Site lies partly within three local planning authority areas, namely Dartford Borough and Gravesham Borough for the Kent Project Site, and Thurrock Council for the Essex Project Site. Relevant local planning policies related to ecology and biodiversity from these three administrations are provided below:

- **Gravesham Local Plan Core Strategy (adopted September 2014):**

- Policy CS12: Green Infrastructure:

"A multifunctional linked network of green spaces, footpaths, cycle routes and wildlife stepping stones and corridors will be created, protected, enhanced and maintained. The network will improve access within the urban area, from the urban area to the rural area and along the River Thames. The key parts of the network are identified on Figure 19: Strategic Green Infrastructure Network.

Sites designated for their biodiversity value will be protected, with the highest level of protection given to internationally designated Special Protection Areas, Special Areas of Conservation and Ramsar sites, followed by nationally designated Sites of Special Scientific Interest, followed by Local Wildlife Sites and then by other areas of more local importance for biodiversity.

There will be no net loss of biodiversity in the Borough, and opportunities to enhance, restore, re-create and maintain habitats will be sought, in particular within the Biodiversity Opportunity Areas shown on the Strategic Green Infrastructure Network map and within new development.

Where a negative impact on protected or priority habitats/species cannot be avoided on development sites and where the importance of the development is considered to outweigh the biodiversity impact, compensatory provision will be required either elsewhere on the site or off-site, including measures for ongoing maintenance."

- **Dartford Local Plan Core Strategy (adopted September 2011):**

- Policy CS14: Green Space:

“The Council will work with its partners to implement a multi-functional, high quality, varied and well-managed Green Grid⁷. It will deliver this by:

a) Facilitating the creation of approximately 300 hectares of new or improved green spaces as part of new developments by 2026.

b) Requiring new development to make a contribution to the Green Grid network as follows:

- *Sites of 20ha and over: at least 30% of the site area*
- *Sites of between 20ha and 2ha: at least 20% of the site area*
- *Sites of less than 2ha will be considered on a site by site basis*

c) Where on-site open space is not appropriate or feasible, contributions may be sought for off-site improvements of open space in the vicinity of the site. Provision of specific types of green space and water bodies to cater for diverse community needs, including older children and teenagers; natural habitats and biodiversity corridors, and for mitigation of flood risk, will be provided within the overall allocation.

d) Working with its partners to implement the projects below, in addition to those in Policy CS 13, through the Council resources and grant funding and as part of the Thames Gateway Parkland project:

- *Darenth Valley corridor – an enhanced path and landscape from the River Thames through Central Park in Dartford Town Centre to the open countryside*
- *Central Park – expansion of the park, increased facilities and restoration of its traditional character*
- *Thames Riverside Path – joining together the existing sections to create a continuous high quality path*
- *Dartford Marshes – delivery of the ‘Managing the Marshes’ project which aims to conserve, manage and enhance the grazing marsh*

⁷ Green Grid – a strategic network of multi-purpose, attractive public open spaces consisting of green corridors, rivers, lakes and landscapes linked via a series of urban and countryside footpaths, Public Rights of Way, cyclepaths and roads, and designed to connect the main open areas within the urban area

- *New Countryside Gateway at South Darenth Lakes*
- *Better connectivity between Dartford and Gravesham countryside through Ebbsfleet Valley and A2 corridor*
- *Creation of a nature reserve east of Stone Lodge*
- *Significant biodiversity improvements at development sites include Ebbsfleet Valley, Swanscombe Peninsula and the Northern Gateway*

e) Protecting and enhancing existing open spaces, including those shown in Diagram 8 and those identified and designated as locally important, the diverse landscape character, areas of nature conservation value, Sites of Special Scientific Interest, National Nature Reserves and local wildlife sites, community and ancient woodlands, as well as priority habitats and species, both in the urban and rural area. Biodiversity enhancements will be focussed on the Biodiversity opportunity Areas. Protection and enhancement of biodiversity on brownfield development sites will be based on survey data.

2. Further guidance on the quality, quantity, management, maintenance and delivery of the component parts of the open space will be set out in the Development Management DPD and/or future SPDs."

- **Dartford Development Policies Plan (adopted July 2017):**

- Policy DP5: Environmental and Amenity Protection:

"Development will only be permitted where it does not result in unacceptable material impacts, individually or cumulatively, on neighbouring uses, the Borough's environment or public health. Particular consideration must be given to areas and subjects of potential sensitivity in the built and natural environment (including as highlighted on the Policies Map) and other policies, and other potential amenity/ safety factors..."

- Policy DP25: Nature Conservation and Enhancement:

"1. Development on the hierarchy of designated sites, featuring nationally recognised and locally protected sites, shown on the Policies Map will not be permitted. Development located within close proximity to designated sites, or with likely effects on them, should demonstrate that the proposal will not adversely impact on the features of the site that define its value or ecological pathways to the site.

2. Proposals should seek to avoid any significant adverse impact on existing biodiversity features. Any potential loss or adverse impact must be mitigated, including with reference to the following guidance points:

a) Where mitigation measures require relocation of protected species this will only be acceptable when accompanied by clear evidence that the proposed method is appropriate and will provide for successful translocation.

b) Proposals should include provision for protection during construction, and mechanisms for on-going management and monitoring.

3. Developments will be expected to preserve and, wherever possible, enhance existing habitats and ecological quality, including those of water bodies, particularly where located in Biodiversity Opportunity Areas. Particular regard should be had to points a) and b) below. Development proposals where the primary purpose is to enhance biodiversity will normally be permitted where:

a) New biodiversity areas make use of native and local species as set out in the Kent Biodiversity Strategy and consider ecological links and adaptability to the effects of climate change

b) Biodiversity features strengthen existing green and ecological corridors; and contribute to the creation and enhancement of the Green Grid.

Large residential development and North Kent European Protected Sites

4. Large residential developments located within 10km from the North Kent European Protected sites that are located outside the Borough will be required to undertake a Habitats Regulation Assessment to demonstrate that the mitigation measures proposed are satisfactory to avoid potential adverse recreational effects to protected features. Information on mitigation options is available on the Council's website.

Trees

5. In all development proposals existing trees should be retained wherever possible. If retention is demonstrated not to be feasible, replacement provision should be of an appropriate tree species and maturity and/or canopy cover taking into account the tree that is being replaced and the location."

- **Thurrock Council Core Strategy and Policies for Management of Development (as amended) (Adopted January 2015):**

- Policy CSTP18: Green Infrastructure:

"1. Green Infrastructure Network

1. The Council, with its partners, will restore, protect, enhance and where appropriate create its green assets. The Green Infrastructure seeks to address the connectivity between urban and rural areas in the Borough and ensure that such green assets are multi-functional in use. Green assets can be those in public or

private ownership and can be legally protected or covered by non-statutory designations.

2. A net gain and New Development

I. The Council will require a net gain in Green Infrastructure. This will contribute to addressing the existing and developing deficiencies, ensuring connectivity and relieving pressure on designated biodiversity sites such as SSSI's.

II. Alongside the requirements for biodiversity set out in Policy CSTP19, development must contribute to the delivery of Green Infrastructure, including the acquisition, planning, design and ongoing management consistent with the emerging Greengrid SPD. A key element of this will be connectivity and the integrity of the network; sites should not be considered in isolation.

III. Opportunities to increase Green Infrastructure will be pursued in new developments through the incorporation of features such as green roofs, green walls and other habitat/wildlife creation and also innovative technology.

IV. Green Infrastructure assets will be identified, enhanced and safeguarded through:

- i. Not permitting development that compromises the integrity of green and historic assets and that of the overall Green Infrastructure network;*
- ii. Using developer contributions to facilitate improvements to the quality, use and provision of multi-functional green assets and green linkages; and*
- iii. Investment from external funding sources."*

○ Policy CSTP19: Biodiversity:

"Development will be encouraged to include measures to contribute positively to the overall biodiversity in the Borough.

1. The Biodiversity Network

The Council will create a robust network of ecological sites centring on the designated sites, i.e. SSSIs, SPAs, Ramsar, Local Nature Reserves and Local Wildlife Sites. These sites will be safeguarded and enhanced to mitigate the effects of past habitat loss and fragmentation, development and climate change.

2. Positive Biodiversity Management

I. The Council will ensure that all designated sites are managed appropriately and will prepare suitable Biodiversity Management Plans, with partners, to demonstrate how positive management will be achieved.

II. Buffering and extensions to existing sites and additional habitat will be sought through the adoption of appropriate Biodiversity Site Management Plans.

III. Access will be balanced against biodiversity interest.

3. Key Sites

The Council has identified the following key sites that it will work with partners to enhance, and will pursue appropriate opportunities to increase the biodiversity network in the Borough.

- i. East Thurrock Marshes;*
- ii. Mardyke Valley Project;*
- iii. Local Wildlife Sites; and*
- iv. Living Landscapes Sites.*

4. Climate Change and Habitat Loss

The Council recognises the need for mitigation for habitat loss due to climate change. It supports the identification, through the Thames Estuary 2100 project, of potential inter-tidal habitat creation sites at Fobbing Marshes and East Tilbury, and fresh water habitat creation sites at North Fobbing Marshes, South Fobbing Marshes, Tilbury and West Tilbury Marshes and the Mardyke.

5. Biodiversity and Geodiversity Action Plans

I. The Council is committed to delivering the actions set out within the Thurrock, Essex and UK Biodiversity Action Plans.

II. The Council will promote small-scale biodiversity interventions such as green roofs.

III. The Council supports the production and implementation of the Geodiversity Action Plans being developed by local 'geo' groups in Eastern England as part of the East of England Geodiversity Partnership."

Best Practice Guidance

12.66 The identification and evaluation of Important Ecological Features (IEFs) for the purposes of EclA, and the assessment of significant adverse or beneficial effects on IEFs, will be undertaken with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland, September 2018 (Version 1.1, updated September 2019).

12.67 In addition, the following guidance documents will be used to inform the assessment:

- Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (PINS, 2015a);
- Advice Note 9: Rochdale Envelope (PINS, 2012);
- Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects (PINS, 2017a);
- Advice Note 12: Transboundary Impacts and Process (PINS, 2015b);
- Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (PINS, 2015c);

- Advice Note 18: The Water Framework Directive (PINS, 2017b); and
- The Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment (and updates) (Highways Agency et al. 2008)

12.68 The following best practice guidance in relation to survey techniques and mitigation measures has been taken into account:

- British Standards Institute (2013) BS 42020 – Biodiversity – Code of Practice for Planning and Development;
- Joint Nature Conservation Committee, (2010). Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
- Marchant, J. H. (1983). Common Birds Census Instructions. BTO, Tring. 12pp.;
- Marchant, J. H., Hudson, R., Carter, S. P. & Whittington, P. A. (1990) Population Trends in British Breeding Birds. BTO, Tring;
- Gilbert, G., Gibbons, D. W. & Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy, Bedfordshire;
- English Nature, (2004). Bat Mitigation Guidelines;
- Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London;
- Joint Nature Conservation Committee, (1999). Bat Workers Manual;
- Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation;
- Paul Bright, Pat Morris and Tony Mitchell-Jones. (2006) 'The dormouse conservation handbook', Second edition. English Nature;
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidelines Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.;
- Harris, S., Cresswell, P., and Jeffries, D.J. (1989). Surveying Badgers, Mammal Society, London;
- Froglife. (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth;

- Gent, T., Gibson, S. (1999). Herpetofauna Workers Manual. JNCC;
- English Nature, 2004. Reptiles: Guidelines for Developers;
- C. M. Drake, D. A. Lott, K. N. A Alexander & J. Webb (2007) Surveying terrestrial and freshwater invertebrates for conservation evaluation. Natural England Research Report NERR005;
- National Rivers Authority (1992). River Corridor Surveys. Conservation Technical Handbook Number 1. NRA, Bristol;
- Environment Agency (2003). River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: 2003. Bristol;
- Environment Agency (1999) Procedures for Collecting and Analysis Macroinvertebrate Samples (issue 2.0), Environment Agency BT001.
- Environment Agency. Freshwater macro-invertebrate sampling in rivers: Operational Instructions 018 08 Issued 16/06/09. Environment Agency, Bristol.
- Murray-Bligh, J.A.D., Furse, M.T., Jones, F.H., Gunn, R.J.M, Dines, R.A. and Wright, J.F. (1997) Procedure for collecting and analysing macroinvertebrate samples for RIVPACS. Joint publication by the Institute of Freshwater Ecology and the Environment Agency, 162 pp.

BASELINE CONDITIONS

- 12.69 This section summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations described above. In particular, this section identifies and evaluates those ecological features/receptors that lie within the Project Site's potential zone of influence and are pertinent in the context of the Proposed Development.
- 12.70 Full results of the desk-based searches and field surveys undertaken, along with their findings, are provided within **Appendix 12.1**. For the purpose of this Preliminary Environmental Information Report, the findings are summarised below along with a final list of 'Important Ecological Features' to be considered within the EclA. References to parts of the Project Site use commonly used names as shown on **Figure 12.1**.

Statutory Designations

- 12.71 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International

designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

12.72 Statutory designations occurring within the potential zone of influence of the Project Site are detailed below and illustrated in **Figure 12.2**.

International Designations (SPAs/SACs/Ramsar)

12.73 No part of the Project Site is covered by any international statutory designations. However, there are four statutory designations of international importance within 15km of the Project Site as listed below. Reasons for their designation are provided within **Appendix 12.1**.

- Thames Estuary and Marshes SPA/Ramsar – located c.3.4km east of the Essex Project Site, and c.7km east of the Kent Project Site;
- Medway Estuary and Marshes SPA/Ramsar – located c.13.4km south-east of the Essex Project Site, and c. 15.7km east of the Kent Project Site;
- North Downs SAC – located 9.8km south-east of the Essex Project Site, and 8km south-east of the Kent Project Site; and
- Peters Pit SAC – located 14km south-east of the Essex Project Site, and 13km south-east of the Kent Project Site.

12.74 Owing to their degree of spatial and functional separation from the Proposed Development and absence of effect-receptor pathways, their reasons for designation and the nature of the Proposed Development (which includes visitors to the resort, as opposed to permanent residents that may give rise to increases in recreational disturbance), it is considered highly unlikely that the Proposed Development will have any adverse effects on North Downs SAC or Peters Pit SAC. Consequently, both designations are scoped out of the EclA and not considered further. This conclusion is consistent with the previous EIA Scoping Opinion from the Secretary of State and Natural England.

12.75 Both Thames Estuary and Marshes SPA/Ramsar and Medway Estuary and Marshes SPA/Ramsar support migratory birds and bird populations that have potential to use areas of ‘functionally linked’ land⁸ near the designations. Two distinct areas within the Kent Project Site that appear to be functionally linked directly to the estuary assemblage, and therefore potentially to nearby Ramsar/SPA/SSSI designations, are Botany Marsh and Black Duck Marsh, which are locally important areas at dawn (rest)/high tide (refuge) for small numbers of several target species.

⁸ ‘Functionally linked land’ refers to land (or sea) beyond the boundary of a European site which might provide a (potentially important) role in maintaining or restoring a protected population at favourable conservation status through the role or function the land (or sea) provides, e.g. providing habitat for refuge, rest or foraging

12.76 Therefore both sites are at potential risk of adverse effects as a result of loss/damage/disturbance of functionally linked land within Botany Marsh and Blackduck Marsh and the Proposed Development. Both designations will therefore be considered Important Ecological Features scoped into the EclA.

National Designations (SSSIs)

12.77 Within the Kent Project Site lies the Bakers Hole SSSI, designated for its geological interest. This SSSI is scoped out of the EclA as its reasons for designation are not related to ecology.

12.78 In addition, within the potential zone of influence of the Project Site, there lies a further six statutory designations of national importance including:

- Darenth Woods SSSI;
- Medway Estuary and Marshes SSSI;
- Rainham Marshes SSSI;
- South Thames Estuary and Marshes SSSI;
- Swanscombe Skull Site SSSI and National Nature Reserve (NNR); and
- West Thurrock Lagoon and Marshes SSSI.

12.79 Reasons for their designation are provided within **Appendix 12.1** and primarily relate to ecology. However, Swanscombe Skull Site SSSI and NNR, which comprises a landscaped area over deposits rich in fossils, is designated for its geological interest.

12.80 In their response to the 2014 Scoping report (Natural England ref: 137264, dated 04 December 2014), Natural England identified that the Proposed Development, which at the time did not include land within the Essex Project Site, has potential to indirectly impact on all of the above designated sites (those listed in **paragraph 12.78**). Owing to its' reason for designation, it is considered that effects upon Swanscombe Skull Site SSSI and NNR are best addressed within the heritage/archaeological chapter. The remaining sites are included within the EclA as Important Ecological Features (IEFs).

12.81 Following review of the additional SSSIs located within the potential zone of influence of the Essex Project Site, as illustrated in **Figure 12.2**, it is not considered that any of these designations would experience a potential adverse risk due to their geographical separation or lack of effect-receptor pathways.

Non-statutory Designations

- 12.82 Non-statutory designations are also commonly referred to in planning policies as ‘local sites’, although in fact these designations are typically considered to be important at a county level. In Kent and Essex, such designations are referred to as Local Wildlife Sites (LWSs). Additional designations which should be considered at this level include Local Nature Reserves (LNRs) and Ancient Semi-natural Woodland (ASNW) where these are not covered by other designations.
- 12.83 There are a number of non-statutory designations occurring both on the Essex and Kent side of the River Thames, which lie within 2km of the Project Site. These designations are described in full within **Appendix 12.1**, with their locations illustrated on **Figure 12.3**.
- 12.84 It is considered that only those non-statutory designations occurring within the DCO Order Limits or within its immediate surroundings will be at potential risk from the Proposed Development. On this basis, the following LWSs will be scoped into the EclA as IEFs requiring further consideration:
- **Botany Marshes LWS** (located within the Kent Project Site) - important owing to the presence of reedbed and the potential for ditch and grazing marsh restoration. Reedbed and grazing marsh are of principal importance in England. Also supports three species of reptile, water vole (*Arvicola amphibius*), otter (*Lutra lutra*) and is of value to birds;
 - **Ebbfleet Marshes, Northfleet LWS** (located within the Kent Project Site) - designated for its range of habitats including reedbed, calcareous stream, lake, scrub, woodland, calcareous and neutral grassland. Protected species have been recorded including reptiles and great crested newts (*Triturus cristatus*);
 - **Alkerden Lane Pit LWS** (adjacent to the north west of the Kent Project Site) – contains nationally scarce plants and Kent’s largest population of green-flowered helleborine (*Epipactis phyllanthos*). Also contains round-leaved wintergreen (*Pyrola rotundifolia*) and several species of nationally rare and scarce invertebrates; and
 - **Tilbury Marshes LWS** (immediately to the east of the Essex Project Site) - relict grazing-marsh, brackish ditches and the outer moats and grasslands of Tilbury Fort. Supports a diverse saltmarsh flora, with species such as saltmarsh rush (*Juncus gerardii*), samphire (*Salicornia spp.*), sea aster (*Aster tripolium*), annual seablite (*Suaeda maritima*) and the nationally scarce stiff saltmarsh grass (*Puccinellia rupestris*) and sea barley (*Hordeum marinum*). Grazing land supports a good grazing-marsh flora, with many Nationally Scarce plants such as divided sedge (*Carex divisa*), slender hare’s ear (*Bupleurum tenuissimum*), with some hairy buttercup (*Ranunculus sardous*), ladies bedstraw (*Galium verum*), narrow leaved birdsfoot trefoil (*Lotus glaber* [tenuis]), *Parapholis sp.* and *Spergularia spp.* The north-western section lies adjacent to the now-lost “Ferry Fields” grassland, an important invertebrate habitat

destroyed by development, but some of the key species may survive on these remaining fragments.

12.85 The remaining non-statutory designations described within **Appendix 12.1** are not considered to be affected by the Proposed Development and have been scoped out of the EclA as an IEF owing to their spatial separation and/or lack of ecological connections with the Project Site. Bluewater Quarry LWS is scoped out of the EclA as its reasons for designation is due to its geological rather than ecological interest.

Habitats/Flora

12.86 A full description of the habitats present within the Project Site is set out in **Appendix 12.1** and illustrated on the 'Extended Phase 1 Habitat Survey' plan (**Figure 12.4**). A summary of the habitats found and described onsite is provided in **Table 12.3**.

Table EDP 12.3: Summary of the Distribution and Value of Habitats within the Project Site

Habitat/Flora	Distribution within the Project Site	Intrinsic Ecological Importance
Rare plants	Populations of 13 nationally scarce species were found on Swanscombe Peninsula in the Kent Project Site 2016. Eight were recorded in 2020	National , nationally scarce
Broad-leaved semi-natural woodland	Mainly in the South along the A2 corridor, some along the eastern boundary	Local , owing to connectivity, good canopy species diversity, ground flora diversity and status as a Priority Habitat.
Broad-leaved plantation woodland	Many areas throughout the Project Site	Site , as small in extent and immature planting
Scrub	Many areas throughout the Project Site	Local , despite being a common habitat, due to extent and structure
Tall ruderal	Small extent in station quarter south	Site , owing to small extent and low species diversity
Improved grassland	Small area in A2 corridor	Site , owing to low species diversity
Poor semi-improved grassland	Botany marsh east, Broadness grasslands and former landfill	Local , species diversity is low across most of extent, but forms large area of continuous habitat
Semi-improved neutral and calcareous grassland	Neutral grassland in Broadness Grassland area and to the west of Black Duck Marsh, calcareous grassland in Craylands Pit, Black Duck Marsh and north of Tiltman Lane	Local to District , some areas of lower botanical diversity but supports nationally scarce plant species. One small area of MG1d grassland in Broadness Grassland with increased value.

Coastal/Floodplain Grazing Marsh	Botany Marsh West	District , a large area of Priority Habitat ⁹ coastal/floodplain grazing marsh
Open mosaic on previously developed land	Bamber Pit and along main access track (including tunnel storage area)	District . Priority Habitat ¹⁰ forming a reasonable area just to the north of Manor Way Industrial Estate. The areas are not floristically diverse but have the potential to support important invertebrate assemblages.
Amenity grassland and shrub	Small area concentrated around Northfleet and road- and trackside verges.	Negligible , owing to low species diversity, intensive management
Marshy grassland	Small area in station quarter south	Site owing to small extent and limited species diversity
Waterbodies (ponds, standing water and ditches)	Scattered throughout the Project Site, ditches forming two main networks at Black Duck and Botany Marshes	District - many ponds are leachate treatment lagoons or contaminated by leachate. The remaining ponds and ditches support little vegetation other than reeds. Ditch network forms part of a large marsh area including Botany Marshes LWS and adjacent grazing marsh and is considered of district level.
Swamp (reedbed)	Black duck Marsh and CTRL Wetland form extensive reedbed, smaller areas exist within Botany Marsh East and along ditch network	County - Priority Habitat forming a large area of the Project Site in close proximity to the River Thames. Priority Habitat
Bare ground	Mostly around Manor Way industrial Estate	Negligible , no species diversity and surrounded by buildings
Hardstanding and buildings	Mostly around Manor Way industrial Estate, station quarter and the Essex Project Site	Negligible , man-made structures
River Ebbsfleet	Along the Eastern boundary of the Kent Project Site	Local , as this river corridor and its associated riparian habitat provide a green corridor

12.87 As shown on **Figure 12.4**, and detailed in **Table 12.3**, the Essex Project Site comprises predominantly hardstanding, industrial land, whilst the Kent Project Site supports a range of habitats including, intertidal sediment, saltmarsh, wetlands, including running water (the River Ebbsfleet), open water (ponds), reedbed/swamp and ditch networks, a range of

⁹ UK Biodiversity Action Plan Priority Habitat Descriptions Coastal and Floodplain Grazing Marsh From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008

¹⁰ UK Biodiversity Action Plan Priority Habitat Descriptions Open Mosaic Habitats on Previously Developed Land (Updated July 2010) From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.

grasslands and open mosaic habitats, arable, scrub, woodland, chalk cliffs/exposures, buildings and bare ground. The saltmarsh and intertidal habitat are described and evaluated in Chapter 12 of the PEIR. Those habitats within the Project Site considered to be of local, or greater, value are taken forward as IEFs in the EclA. In addition, effects and mitigation require consideration in the context of biodiversity loss/gain and will therefore be addressed through habitat creation and enhancement where possible.

- 12.88 The valued habitats noted above, have also been found in some instances to support protected or notable species. This is discussed further within the 'Species' sub-sections subsequently.

Species

- 12.89 As set out previously, information on protected and/or notable species within or near to the Project Site has been collected through a desk study and a range of field surveys. Many of the field surveys are taking place currently and will continue throughout the summer/autumn 2020. The findings of these investigations to date are set out in full in **Appendix 12.1**, and briefly summarised below.

Birds

Wintering Birds

- 12.90 As described in detail in **Appendix 12.1**, in 2019/2020 it was concluded that although the Project Site itself is not regarded to have value at the International level, the wintering wader/wildfowl assemblage present within inland areas of the Kent Project Site itself must be valued at the International level given their status as functionally linked to the estuary assemblage.
- 12.91 Additionally, 28 other terrestrial species (non-wader, non-wildfowl species) of conservation concern were also recorded in generally low to moderate numbers, typically relating to individuals or small flocks of each species recorded on one or two survey visits, but also including a high diversity and moderate abundance of several species listed on Schedule 1 of the Wildlife & Countryside Act (WCA) and species of Conservation Concern. Therefore, the terrestrial wintering bird assemblage present within the Kent Project Site should be considered separately and is of County Importance.

Breeding Birds

- 12.92 Breeding bird surveys are still being completed and results analysed, further details are provided in **Appendix 12.1**. Although surveys have not yet been completed, a diverse assemblage has been recorded within the Kent Project Site due to the presence of a range of wetland, grassland and scrub habitats.
- 12.93 Overall, bird abundance was very high across the Project Site. Green listed species were present in large numbers across all areas. The most commonly recorded green listed

species were wren (*Troglodytes troglodytes*), with a peak count of 90 individuals, whitethroat (*Sylvia communis*) with 101 individuals, reed warbler (*Acrocephalus scirpaceus*) with 69 individuals, robin (*Erithacus rubecula*) with 56 individuals, blackcap (*Sylvia atricapilla*) with 66 individuals, blackbird (*Turdus merula*) with 62 individuals, chiffchaff (*Phylloscopus collybita*) with 49 individuals, and most notably Cetti's warbler, a WCA Schedule 1 species, with 57 individuals. It is considered very likely that these species are breeding within the Kent Project Site. Peregrine falcon (*Falco peregrinus*), another Schedule 1 species, was also recorded hunting within the Kent Project Site.

- 12.94 The total number of species recorded was 93, of which 29 were listed on either the Amber list of Birds of Conservation Concern, or 17 on the Red list. Most notable was a range of wetland species present within Botany Marsh, the Channel Tunnel Rail Link (CTRL) Wetland and Black Duck Marsh. In Botany Marsh West, greylag geese, shelduck, lapwing, gadwall (*Mareca strepera*), mallard, greenshank (*Tringa nebularia*), teal (*Anas crecca*), shoveler and tufted duck (*Aythya fuligula*) were all recorded. Black Duck Marsh supports a pair of marsh harriers (*Circus aeruginosus*) and a small heronry, and there are a small number of pairs of bearded tit (*Panurus biarmicus*) spread between the central CTRL Wetland and Black Duck Marsh. A single spotted crane (*Porzana porzana*) was also recorded crossing a track near Black Duck Marsh in early June.
- 12.95 In addition to the aforementioned peregrine, spotted crane, bearded tit, marsh harrier and Cetti's warbler, other WCA Schedule 1 species recorded within the Kent Project Site were Mediterranean gull, greenshank, redwing and kingfisher.
- 12.96 The scrubland across the peninsula, and to a lesser extent the chalk pits to the south, supports a range of scrubland specialists, including grasshopper warbler (*Locustella naevia*), nightingale (*Luscinia megarhynchos*), cuckoo, as well as the aforementioned whitethroats and other more common species. Dunnock are particularly abundant, with a peak count of 45 singing individuals recorded.
- 12.97 Overall, the breeding bird assemblage found within the Kent Project Site is considered to be of County level significance.

Passage Birds

- 12.98 A single ringed plover (*Charadrius hiaticula*), the only species listed as a qualifying feature of the Thames Estuary and Marshes SPA during passage, was recorded during the high tide survey. Abundance and diversity were significantly reduced from that found along the estuary front throughout winter, with the most abundant birds being black-headed gulls and mallard.

Bats

Bat Roosting – Trees

12.99 During the visual assessment for roosting bats on 04 June 2020, no bats or evidence of bats was found from ground level. However, a total of 19 trees were identified as offering potential to support roosting bats. Fifteen trees were identified as having high potential, two with moderate potential and two as low potential.

Bat Roosting – Buildings

12.100 A total of 150 buildings were identified from maps/aerial photographs within the Project Site. A preliminary 'rapid assessment' of these buildings from public footpaths and roads, was undertaken on 01 May 2020. The purpose of this survey was to determine whether any buildings could be scoped out as having negligible potential to support roosting bats, in order to focus the efforts of further external and internal inspections and presence/absence surveys as required. The assessment was undertaken by two Natural England licensed bat workers. Further visits to the Project Site were made on 07 July 2020, 15 July 2020 and 17 July 2020 to complete external building assessment.

12.101 Following these assessments 101 buildings were assessed as having negligible potential to support roosting bats, due to their construction, or were no longer present. These buildings were therefore not subject to any further level of survey.

12.102 A total of 24 buildings were found to have some level of potential to support roosting bats during the rapid assessment, with 10 assessed as having *Low potential*, 10 assessed as having *Moderate potential* and four assessed as having *High potential*. There were a further 25 buildings that could not be adequately surveyed during the assessment undertaken to date.

12.103 Subject to receipt of the necessary landowner permission to survey the above buildings in greater detail, further internal/external inspections will be undertaken along with presence/absence surveys (comprising emergence/re-entry surveys) as required. Due to the 'lockdown' restrictions on movement and socially distancing measures imposed as part of the Government's response to the COVID-19 global pandemic, it may not be possible to undertake further inspections of many of these buildings, in which case a precautionary approach to the assessment of potential effects and mitigation, using professional judgement, will be adopted.

Bat Foraging/Commuting Activity

12.104 Based on the surveys undertaken to date, a bat assemblage of at least nine species has been recorded within the Kent Project Site. This assemblage includes two nationally rare bats; barbastelle (*Barbastella barbastellus*) and Nathusius' pipistrelle and three Kent Red Data Book species; noctule, Leisler's and Serotine (the latter also being a Kent BAP species); however, recordings from these rare species are few with 84-89.2% of activity

resulting from common pipistrelle. The other species recorded to date include long eared bat (*Plecotus sp.*), *Myotis sp.*, and soprano pipistrelle (*Pipistrellus pygmaeus*).

12.105 Based on the findings summarised above, the bat assemblage is considered to be of at least Local level importance, subject to the findings of further bat surveys to be conducted.

Dormouse

12.106 During the 2020 update desk study KMBRC has returned 12 records of dormouse, including three records dated from 2017 from near the Bluewater Shopping Centre. The closest of these was 250m west of the Kent Project Site. Another record from 2011 originated from a similar area between the Bluewater Shopping Centre and the A296. The other records were all over ten years old, none of which originated within the Project Site. EFC returned one 2009 record from Tilbury Marshes.

12.107 Nest tube surveys are taking place within suitable habitat throughout the Kent Project Site. During the deployment of the tubes in April 2020, three individual dormice were found in old tubes that had remained on the Kent Project Site from previous surveys. Following this, during the May visit, a total of six individual dormice were found in addition to five nests.

12.108 The dormouse population present within the Kent Project Site is considered to be of at least district level importance, subject to the findings of further surveys.

Harvest Mouse

12.109 In 2020, one record was returned by KMBRC dating from 1963 located within the peninsula on the Kent Project Site. Three records were returned from EFC records with only one from the last 10 years and none from the Project Site.

12.110 It is considered likely that a small population of harvest mouse is present on the Swanscombe peninsula and that, on a precautionary basis at this stage, this population will be of at least Local level value. It is therefore anticipated that harvest mouse will therefore be taken forward as an IEF, subject to the findings of surveys to take place in 2020.

Badger

12.111 In 2020, KMBRC and EFC returned many records of badger. None of the records originate from within the Project Site. No evidence of badger has been found during the Extended Phase 1 Survey or any other survey visits so far in 2020. It is not considered likely that badgers are using the Project Site and they will not be taken forward as an IEF.

Otter and Water Vole

12.112 In 2020, KMBRC returned 25 records for water vole, the most recent record originates from 2016 for a location 5.0km east of the Kent Project Site. The other records all predate 2005 with the majority originating from within the marshes in the north of the Kent Project Site. EFC returned six records of water vole with the most recent from 2009 from Thurrock Park. No otter records were returned.

12.113 Following the first water vole check, latrines and feeding were found in Botany Marsh East and West. This would imply that there is a breeding population present in this area. A breeding population of water vole would meet the criteria for designation as an LWS in Kent¹¹. However, the small amount of evidence gathered suggests that the population is of no greater value than at the local to district level, subject to the findings of further survey work.

12.114 An otter was sighted within Blackduck Marsh during the March 2020 wintering bird survey, and the habitat within the reedbeds, marshes and River Ebbsfleet is suitable. Subject to the findings of further surveys, the population is considered likely to be of at least Local value.

Other Mammals

12.115 KMBRC returned 62 records for hedgehog (*Erinaceus europaeus*) of which ten records dated from within the last decade and EFC returned seven records with only three from the last decade. None originated from within the Project Site.

12.116 Ten records for common shrew (*Sorex araneus*) were returned by KMBRC with the majority originating from within the Project Site. Three old records were returned from EFC not from within the Project Site. Six records for pygmy shrew (*Sorex minutus*) were returned by KMBRC of these one originated from within the Project Site dating from 1975.

12.117 Four records of stoat (*Mustela erminea*) and five records of weasel (*Mustela nivalis*) were returned by KMBRC. Three of the weasel records originate from within the Project Site on the Swanscombe Peninsula. EFC returned a single weasel record from Tilbury.

12.118 Two records of brown hare (*Lepus europaeus*) were returned by KMBRC, and one from EFC. All originated from locations outside of the Project Site and the records were old. Whilst all of the above species could potentially be supported by the Kent Project Site, populations are considered likely to be of less than local importance. None of these species are likely to be supported by the Essex Project Site. Other mammals will not be taken forward as an IEF.

¹¹ Local Wildlife Sites in Kent (Formerly called Sites of Nature Conservation Interest) Criteria for Selection and Delineation Version 1.5, August 2015, Kent Wildlife Trust on Behalf of the Kent Nature Partnership

Great Crested Newt

12.119 KMBRC returned 29 records of great crested newts of which only one was from within the last decade. EFC returned seven records with only two from the last decade. That record dated from 2012 and was from 800m south of the Kent Project Site, to the south of Bean. No records were returned from within the Project Site.

12.120 All eDNA results were returned negative. Therefore, great crested newts are considered unlikely to be present and breeding within the Project Site and will not be taken forward as an IEF.

Other Amphibian Assemblage

12.121 In 2020, KMBRC and EFC returned many amphibian records: for palmate newts (*Lissotriton helveticus*), smooth newt (*Lissotriton vulgaris*) common toad (*Bufo bufo*), marsh frog (*Pelophylax ridibundus*) and common frog (*Rana temporaria*). Only one smooth newt record was from the Project Site; however, there were incidental records of smooth newt and marsh frog from the Swanscombe Peninsula, smooth newt from Botany Marsh East and smooth newt and common toad from Bamber Pit during the 2015 surveys.

12.122 The extent of the wetland habitat and waterbodies within the Kent Project Site has the potential to support large numbers of amphibians and records suggest that smooth and palmate newt, common toad and common frog are present. Even with low populations of these species, if all four were present, this would mean Swanscombe peninsula could be designated as a LWS on grounds of its amphibian assemblage. Large numbers of marsh frog have been heard/seen throughout the Peninsula during the course of ecological surveys.

12.123 Collectively, the amphibian assemblage considered likely to be present across the Kent Project Site is valued at local to district level.

Reptiles

12.124 In 2020, KMBRC returned many reptile records. The majority of records were from the Old Malbeon Hospital which is located 1.5km west of the Kent Project Site. There were 189 records for common lizard (nine of which were from within the Kent Project Site), 104 records of slow worm (two from within the Kent Project Site) and 22 records of grass snake (three from within the Kent Project Site) returned.

12.125 KMBRC returned 53 records of adder but none of these were from the Project Site. EFC returned less records of all four species, none of which were from the Project Site.

12.126 So far, two reptile refugia checks have taken place. During the May check counts of 10 common lizard, 15 slow worm and two grass snake were recorded. During the June check counts of 42 common lizard, 10 grass snake and 42 slow worm were recorded.

12.127 This count qualifies the Kent Project Site as a LWS on reptile grounds. Subject to the findings of the remaining surveys, the reptile population is considered likely to be of at least district value and will be taken forward as an IEF. Reptiles are not considered to be present on the Essex Project Site due to the paucity of suitable habitat.

Terrestrial Invertebrates

Previous Surveys

12.128 The 2015 invertebrate survey¹² concluded that:

“The entire site should be considered as 2 different ecological systems:

- a) A dry, well-drained habitat, predominately grassland with a scrub element and patches of intermittent disturbance (substantially present both north and south of Manor Way)*
- b) A wetland habitat, with varying water flow through individual areas. Mostly north of Manor Way, although there are small examples to the south.*

Both these systems are of high (National) ecological importance. This means that the entire site is of high (National) ecological importance. It is also of high importance when considered among local sites for which there is information.”

2020 Surveys

12.129 In 2020, KMBRC returned records of the following species within 2km of the Project Site: 51 lepidoptera records (four butterfly, 51 moth); 10 Hymenoptera; two diptera and three coleoptera. EFC returned records of 215 different beetle species; 10 butterfly species; four dragonfly species; 154 hymenoptera species; 125 moth species; six orthoptera species; 48 hemiptera species; and 485 diptera species. None were from the Essex Project Site.

Spiders

12.130 The 2012 invertebrate survey¹³, focusing specifically on spiders (*Aranea*), concluded that:

*“The site is of most importance for its thermophilic spider fauna. Based on the presence of most of the species of conservation concern, two or three sparsely vegetated areas were considered to be of **National Importance** for their spider fauna. There may be other areas of similar quality not surveyed. Three other areas were surveyed but all supported a limited spider fauna and were considered to be of **Negligible** or **Local Importance**.”*

¹² Chris Blandford Associates (2015) ‘Invertebrate Survey and Assessment of the London Paramount Entertainment Resort’.

¹³ Chris Blandford Associates (2012) ‘2012 Terrestrial Invertebrate Survey Supplementary Report (Spiders (*Aranea*) and related groups)’

12.131 In 2020, the desk study returned one record of the elusive distinguished jumping spider (*Sitticus distinguendus*) from Swanscombe Marshes.

12.132 The 2020 survey data is still being gathered and processed but so far 22 species of conservation concern have been recorded and 262 species in total. The distinguished jumping spider has not been recorded to date. It is considered likely that the Project Site will remain of National importance for terrestrial invertebrates.

Aquatic Invertebrates

Previous Surveys

12.133 The 2015 aquatic macroinvertebrate survey¹⁴ confirmed that *“A total of 199 species of aquatic macroinvertebrate were recorded amongst approximately 70,000 individuals. Amongst these, several species of conservation concern were recorded; one Vulnerable, three Near Threatened, 11 Nationally Scarce and 51 with a Local distribution within the UK. Of the wetland and aquatic plants recorded in and around the waterbodies eight had a Local distribution. A total of five ponds, of the seven surveyed, were of the quality necessary for Priority Habitat Pond status.*

Both Botany and Swanscombe Marshes combined could tentatively be categorised as being at least of County value, if not Regional.”

2020 Surveys

12.134 The 2020 survey data is still being gathered and processed but it is considered likely that the Project Site will remain of County to Regional importance for aquatic invertebrates.

12.135 Aquatic invertebrates recorded on the River Ebbsfleet in isolation are considered to be of less than Local importance as they represent only moderate water quality and a heavily modified water course.

Summary of Important Ecological Features

12.136 Based on the baseline ecological information described above (and presented in full in **Appendix 12.1**), a number of IEFs have been identified and are summarised in **Table 12.3**. Further IEFs may be identified following completion of the remaining surveys.

¹⁴ Aseda (2016) ‘An ecological survey of the waterbodies and wetlands on and around the Swanscombe Peninsula, Kent’

Table 12.3: Important Ecological Features to be Considered Within the EclA

Important Ecological Feature	Key Attributes	Nature Conservation Value
Designations		
Thames Estuary and Marshes SPA/Ramsar	Extensive intertidal mudflats with saltmarsh and channel systems. Internationally importance assemblage of birds and wintering populations of many wader species.	International
Medway Estuary and Marshes SPA/Ramsar/SSSI	Single tidal system with the Swale and joins the southern part of the Thames Estuary between the Isle of Grain and Sheerness. Internationally importance of assemblage of birds and wintering populations of many wader species.	International
Darenth Woods SSSI	Some of the most valuable areas of ancient semi-natural woodland in north-west Kent with rare woodland types.	National
Inner Thames Marshes SSSI	Largest remaining expanse of wetland bordering the upper reaches of the Thames Estuary. Diverse bird interest especially the variety of breeding birds and the numbers of wintering wildfowl, waders, finches and birds of prey.	National
South Thames Estuary and Marshes SSSI	Extensive mosaic of grazing marsh, saltmarsh, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes. Freshwater pools and some areas of woodland provide additional variety and complement the estuarine habitats. Supports outstanding numbers of waterfowl, total counts regularly over 20,000.	National
West Thurrock Lagoon and Marshes SSSI	One of the most important sites for wintering waders and wildfowl on the Inner Thames Estuary. Extensive intertidal mudflats together with a large and secure high tide roost, attracts waders in nationally important numbers, with significant populations of other bird species. The adjacent Stone Ness saltmarsh is noted for the size and character of its high marsh plant community.	National
Botany Marshes LWS	Reedbed and potential for ditch & grazing marsh restoration. Reedbed and grazing marsh are of principal importance in England. Also supports three species of reptile, water vole (<i>Arvicola amphibius</i>), otter (<i>Lutra lutra</i>) and is of value to birds	County

Important Ecological Feature	Key Attributes	Nature Conservation Value
Ebbsfleet Marshes, Northfleet LWS	Range of habitats including reedbed, calcareous stream, lake, scrub, woodland, calcareous and neutral grassland. Protected species have been recorded including reptiles and great crested newts (<i>Triturus cristatus</i>).	County
Alkerden Lane Pit LWS	Contains nationally scarce plants and Kent's largest population of green-flowered helleborine (<i>Epipactis phyllanthos</i>). Also contains round leaved wintergreen (<i>Pyrola rotundifolia</i>) and several species of nationally rare and scarce invertebrates.	County
Tilbury Marshes LWS	Diverse saltmarsh flora. Good grazing-marsh flora. An important invertebrate habitat destroyed by development, but some of the key species may survive on these remaining fragments.	County
Habitats/ Flora		
Rare plants	Populations of 13 nationally scarce species were found in 2016. Eight species were recorded in 2020, along with an additional 2 species not recorded previously.	National
Broad leaved Semi Natural Woodland	Woodland with good canopy species and ground flora species diversity. Connects to other woodlands in wider area	Local
Scrub	Extensive mature and colonising scrub forming a corridor of woody habitats between the A2 and the River Thames	Local
Semi-improved grassland	Including areas of species-poor semi-improved grassland and areas of semi-improved neutral, and calcareous grassland (with relict areas of more species-rich grassland of NVC MG1d and CG2 but not extensive or fine examples)	Local to District
Coastal/Floodplain Grazing Marsh	Botany Marsh West - Priority Habitat ¹⁵ coastal/floodplain grazing marsh	District
Open mosaic on previously developed land	Discrete areas within the Kent Project Site that fulfil the Priority Habitat description.	District

¹⁵ UK Biodiversity Action Plan Priority Habitat Descriptions Coastal and Floodplain Grazing Marsh From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008

Important Ecological Feature	Key Attributes	Nature Conservation Value
Waterbodies (ponds, standing water and ditches)	Extensive ditch network around the peninsula with associated ponds. Ditch network forms part of a large marsh area including Botany Marshes LWS and adjacent grazing marsh and is considered of district level. Some ponds, within Broadness Grassland particularly, are contaminated by leachate from the nearby cement production facility and are of negligible ecological value.	District
Swamp (reedbed)	Three main areas in Black Duck Marsh, Channel Tunnel Rail Link (CTRL) Wetland and Botany Marsh, the latter of which is partially designated as a LWS. Priority habitat.	County
River Ebbsfleet	Acts as a wildlife corridor and is linked to reed bed and woodland habitats. Moderate water quality.	Local
Species		
Wintering waterfowl and wading bird assemblage	Supports many of the species associated with the nearby SPA/Ramsars.	International
Wintering terrestrial bird assemblage	28 species of conservation concern recorded in low to moderate numbers	County
Breeding Bird Assemblage	91 species recorded so far of which 28 were listed on either the Amber list of Birds of Conservation Concern, or 16 on the Red list.	County
Bat Assemblage	Assemblage of at least nine species, including one Kent BAP species. However, the activity is predominantly of common pipistrelle bats. One tree Roost confirmed, and a further three possible tree roosts found in 2016. 2020 data in progress.	Local
Dormouse	Confirmed presence within the Kent Project Site. Considered to be using the Kent Project Site for dispersal, foraging and breeding. Likely to be a meta population with that close to the Bluewater shopping centre	District
Otter	Confirmed present within Blackduck Marsh, and suitable habitat throughout the ditch network. Reedbeds, marshes and on the River Ebbsfleet.	Local
Water Vole	Latrines and feeding sign found in Botany Marsh East and West – likely breeding and therefore meets LWS selection criteria	Local to district
Harvest Mouse	Considered likely to be present	Local

Important Ecological Feature	Key Attributes	Nature Conservation Value
Amphibian assemblage	Likely to support four species and meets criteria for LWS selection	Local to district
Reptile assemblage	Three species supported. Likely to be exceptional populations of common lizard and slow worm. Meets criteria for LWS selection	District
Terrestrial Invertebrates	Current data in process but 22 species of conservation concern so far recorded and a total of 262 species. Considered likely to remain of National importance	National
Aquatic Invertebrates	Current data in process but previous data suggests an assemblage of County to Regional importance	County to regional

12.137 In accordance with the assessment methodology described earlier, all other habitats and species/species groups are deemed to be of only Site level nature conservation importance or less, and will not be taken forward for detailed assessment, since effects upon such features are unlikely to be 'significant' in EIA terms.

Future Baseline Conditions

12.138 It is anticipated that, in the absence of development, the Kent Project Site would continue to be neglected resulting in further scrub encroachment and natural succession through to woodland. As a result, it is anticipated that some species confirmed present, which are dependent on woody/scrub habitats, would flourish, whilst others, reliant on open grassland/marsh habitats, would diminish.

12.139 There is also evidence of fly tipping, littering, illegal camping, and fires across the Kent Project Site, which has a negative impact on the existing biodiversity, and can reasonably be expected to continue if the site remains undeveloped.

12.140 In the absence of development, the biodiversity value of the Essex Project Site, being predominantly developed land with little ecological interest, is considered unlikely to change.

12.141 Furthermore, it is not considered that the species or habitats identified would be significantly affected by, or vulnerable to, climate change in the future. The important habitats and species identified are not considered to be susceptible to such changes and the Project Site is not near the edge of any of their ranges.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Inherent Mitigation Measures

12.142 The key inherent mitigation measures included within the Illustrative Masterplan (see PEIR Chapter 5), and on the 'Green Infrastructure Strategy', including the 'Ecology and Landscape Initiatives', enclosed as **Appendix 12.2**, include:

- Retention of areas of ecological value including Blackduck Marsh, Botany Marsh East LWS, Broadness grasslands and saltmarsh, Bamber Pit and areas of semi-natural habitat throughout the Ebbsfleet Valley;
- Retention of large areas of saltmarsh and inter-tidal mudflats around the edge of the Swanscombe Peninsula; and
- Provision of a large area managed primarily for biodiversity including Blackduck Marsh, Broadness grassland and Botany Marsh East LWS, comprising a mixture of reedbed, open grassland, scrub, ditches, ponds and wetland/SuDS features.

Construction Impacts and Effects

12.143 The assessment of likely potential significant environmental effects considers those construction activities related to the Project, as well as those related to its operation.

12.144 Without mitigation, the potential effects of the Proposed Development during the construction phase on the IEFs identified above are summarised below:

- Direct habitat loss, damage or degradation;
- Habitat fragmentation/loss of flight paths/dispersal routes;
- Habitat disturbance;
- Killing, injuring and disturbance of wild animals;
- Increased collision risk to birds and bats;
- Increased dust, and noise, vibration, visual and light disturbance;
- Hydrological effects, including changes to water quality/quantity;
- Pollution/contamination incidents; and
- Spread of invasive species.

12.145 Further details, including which IEFs these potential effects relate to, are provided within **Table 12.4**.

Operational Impacts and Effects

12.146 Without mitigation, the potential effects of the proposed development on the IEFs identified above during the operational phase could include:

- Habitat fragmentation/loss of flight paths/dispersal routes;
- Increased lighting, noise and traffic leading to disturbance of species within retained and newly created habitats;
- Increased collision risk to birds and bats;
- Hydrological effects, including changes to water quality/quantity; and
- Damage or degradation to habitats and disturbance of wildlife through increased recreational pressure and trampling; and
- Potential positive effects/benefits through provision of habitats with greater biodiversity value than those currently present, and implementation of appropriate management of the retained and created habitats to maximise their biodiversity potential.

12.147 Further details, including which IEFs these potential effects relate to, are provided within **Table 12.4**.

Biodiversity Net Gain Assessment

12.148 The extent of important ecological habitats within the Project Site and the quantities retained, lost and proposed have been assessed using the 'beta test' version of the Biodiversity Metric 2.0, developed by Natural England¹⁶ with reference to the biodiversity net gain requirement specified within the National Planning Policy Framework (NPPF) (Paragraph 170. d). Within the current draft of the Environment Bill, as submitted to Parliament, Nationally Significant Infrastructure Projects (NSIPs) are exempt from the requirement to deliver 10% net gain. The Applicant is submitting the biodiversity metric on a voluntary basis to demonstrate a commitment to delivering net gain in accordance with the NPPF. These biodiversity net gain assessment calculations, which are provided in **Appendix 12.3**, have been used to objectively provide an overall biodiversity score for the project.

12.149 It should be noted that the calculations are based on the London Resort Masterplan and additional detail regarding landscape treatment as shown on the Green Infrastructure

¹⁶ <http://publications.naturalengland.org.uk/publication/5850908674228224>

Strategy (**Appendix 12.2**), and therefore may be subject to a degree of variance as the resort design progresses. However, subject to the delivery of appropriate habitat provision and management, this is considered to be sufficient for assessing the overall biodiversity impact of the Proposed Development at this stage.

12.150 As shown in detail in **Appendix 12.3**, and summarised below, overall, the Proposed Development is considered likely to result in a net loss in habitat units:

- Net biodiversity units (habitat units) = - 335 units (- 15% net loss)

12.151 To achieve a net gain, the Applicant is committed to the funding and delivery of an offsite compensation scheme involving habitat creation and enhancement sufficient to deliver the necessary credits to achieve a net gain, in line with the current requirements of the NPPF (Paragraph 170. d). The applicant will be working with local landowners, consultees, stakeholders and delivery partners to devise an appropriate biodiversity offsetting scheme.

PROPOSED MITIGATION

12.152 The preceding section of this PEIR provides an overview of the inherent mitigation measures incorporated into the Proposed Development. However, not all likely significant negative effects can be avoided or reduced in severity through inherent mitigation alone. This section therefore identifies those additional mitigation measures required to avoid, reduce or offset the likely significant negative impacts.

12.153 The key mechanisms to deliver mitigation will include measures to:

- Conform with relevant and pertinent legislative requirements, particular those associated with legally protected species; and
- Deliver and, where possible, maximise opportunities for biodiversity enhancement and gain through the Proposed Development.

12.154 The mitigation strategy will be developed in full following completion of further technical work to establish the ecology baseline, completion of the Green Infrastructure Strategy, and in response to consultee comments.

12.155 Provisionally, it is considered that the key mechanisms to deliver mitigation will be implemented through:

- A Construction Environmental Management Plan (CEMP), to include (but not limited to):
 - Restricted working hours and sensitive lighting strategy to minimise impacts on nocturnal wildlife;

- Suppression of construction noise and dust;
- Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy; and
- Adherence to pollution prevention guidelines
- An Ecological Mitigation and Management Framework (EMMF), to include:
 - A series of Ecological Construction Method Statements (ECMS), to include (but not limited to):
 - Provision of an Ecological Clerk of Works (ECoW) to supervise construction activities in sensitive areas for habitats and species;
 - Provision of 'toolbox talks' to relevant site contractors;
 - Method statements for the delivery of works in sensitive areas, including controls over timing/duration of works to avoid sensitive times of year (e.g. the bird breeding season);
 - Precautionary methods of working and sensitive vegetation/site clearance (under a European Protected Species where necessary), e.g. 'soft-felling' trees with bat roost potential or removal of suitable dormouse habitat;
 - Translocation of protected species prior to construction works commencing (under a European Protected Species where necessary);
 - Sensitive lighting strategy to minimise impacts on nocturnal wildlife, where possible;
 - Establishment of Ecological Protection Zones (EPZs), through use of protective fencing, to prevent construction activities damaging retained habitats; and
 - Update ecology surveys prior to commencement of works;
 - A Landscape and Ecology Management Plan (LEMP), to include (but not limited to):
 - Prescriptions for the ongoing management, maintenance and monitoring of the IEFs and of those newly created habitats to maximise opportunities for biodiversity enhancement and gain;

- Management of open spaces for biodiversity, with controlled/restricted recreational use within sensitive areas;
 - Objectives and principles for the long-term management of ecology interests; and
 - Compliance checks and monitoring to ensure the success of the implemented measures against the objectives and principles, with interventions carried out as necessary.
- Ecological mitigation, enhancement and compensation measures, including habitat- or species-specific measures, including a biodiversity net gain assessment;
- Green Infrastructure Strategy (GIS) and subsequent detailed Soft Landscaping Scheme (SLS) providing full details of new habitat creation and the necessary infrastructure to provide controlled/restricted access for recreation in the open space;
 - A Sustainable Drainage System to both avoid or mitigate any potential effects on water quality and flow within sensitive habitats, and to provide suitable hydrological conditions for new wetland habitats of ecological value to become established; and
 - Detailed Lighting Strategy providing details/specifications of lighting design in key locations to avoid/minimise light spill on habitats used by sensitive/nocturnal species, where possible.

12.156 Further detail on these measures, including which IEFs they relate to, is provided within **Table 12.4.**

RESIDUAL ENVIRONMENTAL EFFECTS

12.157 The residual effects are the likely effects occurring following implementation of the design measures, construction phase and operational phase mitigation measures described above. The residual effects are detailed within **Table 12.4.**

CUMULATIVE AND IN-COMBINATION EFFECTS

12.158 Those cumulative impacts that can be foreseen as a result of the Proposed Development in conjunction with the identified schemes, and any possible mitigation measures required, will be assessed and fully reported in the ES.

CLIMATE CHANGE

- 12.159 Potential climate change projections have been calculated for the Proposed Development and are detailed within PEIR Chapter 20. In summary, the projections estimate an increase in winter and summer mean and mean daily maximum/minimum temperatures, an increase in winter mean precipitation, a decrease in summer mean precipitation, and rising sea levels.
- 12.160 Given that the valued habitats and species within the Project Site are largely widespread and the Project Site is largely not near the edge of any of their ranges; the projected change in temperatures is not anticipated to result in any significant impacts on the designated site, habitat and species IEFs.
- 12.161 However, the projected changes in precipitation may have impacts on the aquatic habitats within the Kent Project Site, including the reedbed, grazing marsh, waterbodies and watercourse, and consequently the species associated with them, such as otter, water vole, amphibians and invertebrates. It is considered that the generous provision of greenspace within the Proposed Development, which will be managed to promote biodiversity, the large area of varied SuDs/attenuation features proposed throughout the scheme and the large buffer afforded to the watercourse corridor (with additional aquatic features incorporated within it), will provide sufficient resilience to any likely effects of future climate change.
- 12.162 Furthermore, future monitoring of the new and retained habitats within the Project Site recommended to be detailed within the LEMP, as described above in the mitigation section, will allow an opportunity for management prescriptions to be reviewed and amended to reflect any impacts as a result of climate change. This will further safeguard the habitat and species interests at the Project Site over the long term.

SUMMARY AND CONCLUSIONS

- 12.163 This chapter provides an assessment of the significance and consequences of likely ecological impacts upon identified Important Ecological Features (IEFs) arising from the Proposed Development for the London Resort. It has been prepared as part of a Preliminary Environmental Impact Report (PEIR) for the Project Site.
- 12.164 Preliminary impact avoidance, mitigation and compensation measures have been prepared as part of a holistic ecology strategy for the Proposed Development, as far as they have been prepared at this stage in the project, to address any likely significant effects that may arise during construction and after completion (operation) of the Proposed Development. Additional measures to mitigate and compensate for potentially significant effects have been provided.
- 12.165 Further baseline information in support of this chapter and subject to pre-consultation discussions with Statutory Consultees is included within the Ecological Baseline (**Appendix**

12.1) and is referred to throughout the assessment. The approach taken in this assessment is made with reference to the guidelines published in 2018 by the Chartered Institute of Ecology and Environmental Management (CIEEM).

12.166 The baseline survey work has identified the following IEFs pertinent to the Proposed Development:

Designated Sites

- Thames Estuary and Marshes SPA/Ramsar;
- Medway Estuary and Marshes SPA/Ramsar/ SSSI;
- Darenth Woods SSSI;
- Inner Thames Marshes SSSI;
- South Thames Estuary and Marshes SSSI;
- West Thurrock Lagoon and Marshes SSSI;
- Botany Marshes LWS;
- Ebbsfleet Marshes, Northfleet LWS;
- Alkerden Lane Pit LWS; and
- Tilbury Marshes LWS.

Habitats/Flora

- Rare plants;
- Broad leaved Semi Natural Woodland;
- Scrub;
- Semi-improved grassland;
- Coastal/Floodplain Grazing Marsh;
- Open mosaic on previously developed land;
- Waterbodies (ponds, standing water and ditches);

- Swamp (reedbed); and
- River Ebbsfleet.

Species

- Wintering waterfowl and wading bird assemblage;
- Wintering terrestrial bird assemblage;
- Breeding Bird Assemblage;
- Bat Assemblage;
- Dormouse;
- Otter;
- Water Vole;
- Harvest Mouse;
- Amphibian assemblage;
- Reptile assemblage;
- Terrestrial Invertebrates; and
- Aquatic Invertebrates.

12.167 The impact assessment has identified that certain actions could result in significant negative impacts on these IEFs without mitigation. Inherent avoidance, mitigation and compensation measures and the implementation of an Ecological Mitigation and Management Framework, including construction methods statements and long term habitat management principles, are considered to ameliorate to some degree those significant impacts identified. Much of the mitigation measures proposed at this stage rely on the provision of a significant area of off-site compensation land in order to deliver the necessary wetland habitat creation required to avoid significant residual effects.

12.168 However, at this stage, and subject to further development of the ecological mitigation and enhancement strategy, it is predicted that some significant residual negative effects will remain to the following on-site features during the construction phase: habitats, including scrub, semi-improved grassland, and open mosaic on previously developed land; and species/species assemblages, including the wintering waterfowl and wading bird assemblage, wintering terrestrial bird assemblage, breeding bird assemblage, otter, water vole, harvest mouse, reptiles, and terrestrial invertebrates. Subject to further refinement

of the off-site compensation land strategy, there is scope that many of these effects can be reduced to non-significant levels.

12.169 During the operational phase, it is currently anticipated that there will be a minor negative residual effect significant at the local level to the Botany Marshes LWS and its associated flora and fauna as a result of increased visual and aural disturbance, and a minor negative residual effect significant at the local level to the local bat assemblage as a result of increased artificial lighting.

12.170 Overall, despite the residual effects identified above it is considered that the scheme is capable of delivering an overall net biodiversity gain subject to the creation of an extensive biodiversity offsetting scheme involving the creation of new wetland habitat, including floodplain grazing marsh, ditches, reedbeds, and delivery on-site of a suite of habitat creation and enhancement measures to create/maintain a mosaic of habitats as currently present on site, along with their long term management and maintenance.

12.171 A summary of those activities during the construction and operational phases of the Proposed Development impacting upon identified IEFs, including the proposed mitigation, enhancement and, where necessary, compensation mechanism, should any residual impacts remain, are provided within **Table 12.5**.

Table 12.5: Ecology Impact Assessment Summary

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Construction Phase								
Designations								
Thames Estuary and Marshes SPA/Ramsar	International	Direct loss of functionally linked land	Permanent, moderate magnitude and extent	Significant negative at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through Green Infrastructure Strategy (GIS) and Ecological Mitigation and Management Framework (EMMF)	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
		Indirect chemical and dust pollution of functionally linked land	Temporary, minor magnitude and extent	Significant negative at district level	Production of EMMF including an Ecological Construction Method Statement (ECMS) detailing creation of Ecological Protection Zones (EPZs) and sensitive working practices; and production of CEMP detailing sensitive working practices, dust suppression measures, materials storage to reduce risk of pollution events, and adherence to pollution prevention guidelines.	Negligible	Not significant	Certain, subject to strict adherence to control measures
		Visual and aural disturbance of birds using functionally linked land	Temporary, reversible, moderate magnitude and extent	Significant negative at district level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/ time periods and provision of visual and sound screening where possible. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Negligible	Not significant	Certain, subject to strict adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Medway Estuary and Marshes SPA/Ramsar/SSSI	International	Direct loss of functionally linked wetland habitat	Permanent, moderate magnitude and extent	Significant negative at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
		Indirect chemical and dust pollution of functionally linked land	Temporary, minor magnitude and extent	Significant negative at district level	Production of EMMF detailing creation of EPZs and sensitive working practices; production of CEMP detailing sensitive working practices, dust suppression measures and materials storage to reduce risk of pollution events, and adherence to pollution prevention guidelines.	Negligible	Not significant	Certain, subject to strict adherence to control measures
		Visual and aural disturbance of birds using functionally linked land	Temporary, reversible, moderate magnitude and extent	Significant negative at district level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/time periods and provision of visual and sound screening where possible. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Negligible	Not significant	Certain, subject to strict adherence to control measures
Darenth Woods SSSI	National	Indirect disturbance by construction traffic along A2	Temporary, reversible, minor magnitude and extent	Not significant	No additional mitigation	Negligible	Not significant	Certain
		Dust and air pollution	Temporary, reversible, minor magnitude and extent	Not significant	No additional mitigation	Negligible	Not significant	Certain
		Light pollution	Temporary, reversible, minor magnitude and extent	Not significant	No additional mitigation	Negligible	Not significant	

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Inner Thames Marshes SSSI	National	Visual and aural disturbance of birds using functionally linked land	Temporary, reversible, moderate magnitude and extent	Significant negative at district level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/time periods and provision of visual and sound screening where possible. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Negligible	Not significant	Certain, subject to strict adherence to control measures
		Direct loss of functionally linked wetland habitat	Permanent, moderate magnitude and extent	Significant negative at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat, enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats, including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
South Thames Estuary and Marshes SSSI	National	Direct loss of functionally linked wetland habitat	Permanent, moderate magnitude and extent	Significant negative at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
		Indirect chemical and dust pollution of functionally linked land	Temporary, minor magnitude and extent	Significant negative at district level	Production of EMMF detailing creation of EPZs and sensitive working practices; production of CEMP detailing dust suppression measures and materials storage to reduce risk of pollution events	Negligible	Not significant	Certain, subject to strict adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Visual and aural disturbance of birds using functionally linked land	Temporary, reversible, moderate magnitude and extent	Significant negative at district level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/time periods and provision of visual and sound screening where possible. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Negligible	Not significant	Certain, subject to strict adherence to control measures
West Thurrock Lagoon and Marshes SSSI	National	Visual and aural disturbance of birds using functionally linked land	Temporary, reversible, moderate magnitude and extent	Significant negative at district level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/time periods and provision of visual and sound screening where possible. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Negligible	Not significant	Certain, subject to strict adherence to control measures
		Direct loss of functionally linked wetland habitat	Permanent, moderate magnitude and extent	Significant negative at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
Botany Marshes LWS	County	Dust and chemical pollution	Temporary, major magnitude and extent	Significant at local level	Production of EMMF detailing creation of EPZs and sensitive working practices; production of CEMP detailing sensitive working practices, dust suppression measures, materials storage to reduce risk of pollution events, and adherence to pollution prevention guidelines.	Negligible	Not significant	Certain, subject to strict adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Alteration of hydrological regime through destruction of adjoining wetland	Permanent, major magnitude and extent	Significant at county level	Development of a sustainable drainage and hydrological strategy to maintain water at current/favourable levels	Negligible	Not significant	Certain, subject to design and implementation of suitable drainage and hydrological strategy
		Aural and visual disturbance	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/time periods and provision of visual and sound screening where possible.	Negligible	Not significant	Certain, subject to strict adherence to control measures
		Degradation of habitat through deposition of materials	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the EMMF, detailing EPZs where no materials or site facilities may be situated.	Negligible	Not significant	Certain, subject to strict adherence to control measures
Ebbsfleet Marshes, Northfleet LWS	County	Direct loss of habitat through Station Quarter South	Permanent, moderate magnitude and extent	Significant at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
		Chemical and dust pollution of River Ebbsfleet and adjoining floodplain	Temporary, moderate magnitude and extent	Significant at local level	Production of EMMF detailing creation of EPZs and sensitive working practices; production of CEMP detailing dust suppression measures and materials storage to reduce risk of pollution events. Development of a sustainable drainage and hydrological strategy to maintain water quality at current/favourable level	Negligible	Not significant	Certain, subject to strict adherence to control measures, and development and implementation of suitable drainage and hydrological strategy
		Degradation of habitat through deposition of materials	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the EMMF, detailing EPZs where no materials or site facilities may be situated.	Negligible	Not significant	Certain, subject to strict adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Alteration of hydrological regime	Permanent, moderate magnitude and extent	Significant at local level	Development of a sustainable drainage and hydrological strategy to maintain water at current/favourable levels.	Negligible	Not significant	Certain, subject to design and implementation of suitable drainage and hydrological strategy
Alkerden Lane Pit LWS	County	Loss of part of plant and invertebrate meta-population	Permanent, minor magnitude and extent	Significant at local level	Enhancement of retained habitats and creation of new habitats for notable species, delivered through the GIS and EMMF.	Negligible	Not significant	Certain, subject to design and implementation of suitable ecology mitigation and enhancement strategy
Tilbury Marshes LWS	County	Dust and chemical pollution	Temporary, moderate magnitude and extent	Not significant	Production of EMMF and CEMP detailing sensitive working practices and materials storage to reduce risk of pollution events	Negligible	Not significant	Certain
		Visual and aural disturbance of birds using functionally linked land	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/ time periods and provision of visual and sound screening where possible.	Negligible	Not significant	Certain, subject to strict adherence to control measures
Habitats/Flora								
Populations of nationally scarce plants	National	Direct loss of plants, and part of population	Permanent, major magnitude and extent	Significant at regional level	Enhancement of retained habitats and creation of new habitats for notable species, delivered through the EMMF. Transplanting of nationally scarce plants/seed bank.	Negligible	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Air pollution	Temporary, minor magnitude and extent	Significant at local level	Production of the EMMF, including details of clean air strategy to avoid nitrogen deposition on sensitive habitats.	Negligible	Not significant	Certain, subject to design and implementation of suitable clean air strategy
		Temporary loss of habitat through deposition and storage of materials	Temporary, minor magnitude and extent	Significant at regional level	Sensitive construction strategy detailed within the EMMF, detailing EPZs where no materials or site facilities may be situated.	Negligible	Not significant	Certain, subject to strict adherence to control measures
Broad leaved Semi Natural Woodland	Local	Dust and air pollution	Temporary, minor magnitude and extent	Significant at local level	Production of the EMMF, including details of clean air strategy to avoid nitrogen deposition on sensitive habitats, and dust suppression measures.	Negligible	Not significant	Certain, subject to design and implementation of suitable clean air strategy

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Scrub	Local	Direct loss of habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained scrub habitats and commencement of rotational management to avoid excessive encroachment and to maintain varied structure and open mosaic habitat, delivered through the EMMF. Habitat loss partially offset through provision of biodiversity offsetting scheme	Minor negative	Significant at local level	Certain
		Disturbance/ degradation of habitat through deposition of materials in root protection area	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs where no materials or site facilities may be situated.	Negligible	Not significant	Certain, subject to strict adherence to control measures
		Air and dust pollution	Temporary, minor magnitude and extent	Significant at local level	Production of the EMMF, including details of clean air strategy to avoid nitrogen deposition on sensitive habitats, and dust suppression measures.	Negligible	Not significant	Certain, subject to design and implementation of suitable clean air strategy
Semi-improved grassland	Local to District	Direct loss of habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained grassland habitats and commencement of rotational management to avoid scrub encroachment and to maintain varied structure, delivered through the GIS and EMMF. Habitat loss partially offset through provision of biodiversity offsetting scheme	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Physical disturbance	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs.	Negligible	Not significant	Certain, subject to adherence to control measures
		Degradation through deposition and storage of materials	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs where no materials or site facilities may be situated.	Negligible	Not significant	Certain, subject to adherence to control measures
		Air and dust pollution	Temporary, minor magnitude and extent	Significant at local level	Production of an EMMF, including details of clean air strategy to avoid nitrogen deposition on sensitive habitats, and dust suppression measures.	Negligible	Not significant	Certain, subject to adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Coastal/ floodplain grazing marsh	District	Direct loss of habitat	Permanent, major magnitude and extent	Significant at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
Open mosaic on previously developed land	District	Direct loss of habitat	Permanent, major magnitude and extent	Significant at district level	Enhancement of retained equivalent habitats in Bamber Pit and commencement of rotational management to avoid scrub encroachment and to maintain varied structure and open mosaic habitat, delivered through the GIS and EMMF. Habitat loss partially offset through provision of biodiversity offsetting scheme	Moderate negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Physical disturbance	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs.	Negligible	Not significant	Certain, subject to adherence to control measures
		Degradation through deposition and storage of materials	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs where no materials or site facilities may be situated.	Negligible	Not significant	Certain, subject to adherence to control measures
		Air and dust pollution	Temporary, minor magnitude and extent	Significant at local level	Production of an EMMF, including details of clean air strategy to avoid nitrogen deposition on sensitive habitats, and dust suppression measures.	Negligible	Not significant	Certain, subject to adherence to control measures, design and implementation of suitable clean air strategy

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Waterbodies (ponds, standing water and ditch network)	District	Direct loss of habitat	Permanent, major magnitude and extent	Significant at county level	Enhancement of retained waterbodies, creation of new boundary ditch around resort connecting to existing ditch network and linking to Botany Marsh. Removal of or separation from contaminants where possible to increase water quality. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Minor positive	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Physical disturbance	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs.	Negligible	Not significant	Certain, subject to adherence to control measures
		Changes to hydrological regime	Permanent, major magnitude and extent	Significant at local level	Development of a sustainable drainage and hydrological strategy to maintain water at current/favourable levels.	Negligible	Not significant	Certain, subject to design and implementation of suitable drainage and hydrological strategy
		Chemical and dust pollution	Temporary, minor magnitude and extent	Significant at local level	Production of a CEMP and EMMF detailing creation of EPZs, sensitive working practices, dust suppression measures and materials storage to reduce risk of pollution events.	Negligible	Not significant	Certain, subject to adherence to control measures
Swamp (reedbed)	County	Direct loss of habitat	Permanent, major magnitude and extent	Significant at county level	Enhancement of retained reedbed and commencement of management regime to reduce scrub encroachment and ensure an ecotone from drier reedbed and open water, delivered through the EMMF and GIS. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat	Moderate positive	Significant at district level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Physical disturbance	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction strategy detailed within the CEMP and EMMF, detailing EPZs.	Negligible	Not significant	Certain, subject to adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Changes to hydrological regime	Permanent, major magnitude and extent	Significant at local level	Development of a sustainable drainage and hydrological strategy to maintain water at current/favourable levels	Negligible	Not significant	Certain, subject to design and implementation of suitable drainage and hydrological strategy
		Chemical and dust pollution	Temporary, minor magnitude and extent	Significant at local level	Production of a CEMP and EMMF detailing creation of EPZs, sensitive working practices, dust suppression measures and materials storage to reduce risk of pollution events.	Negligible	Not significant	Certain, subject to adherence to control measures
River Ebbsfleet	Local	Direct loss of connected floodplain habitat	Permanent, moderate magnitude and extent	Significant at local level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
		Chemical and dust pollution	Temporary, minor magnitude and extent	Significant at local level	Production of a CEMP and EMMF detailing creation of EPZs, sensitive working practices, dust suppression measures and materials storage to reduce risk of pollution events.	Negligible	Not significant	Certain, subject to adherence to control measures
		Changes to hydrological regime	Permanent, moderate magnitude and extent	Significant at local level	Development of a sustainable drainage and hydrological strategy to maintain water at current/favourable levels	Negligible	Not significant	Certain, subject to design and implementation of suitable drainage and hydrological strategy

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Species								
Wintering Waterfowl and Wading Bird Assemblage	International	Visual and aural disturbance	Temporary, moderate magnitude and extent	Significant at district level	Sensitive construction methodology delivered through the CEMP and EMMF, including: avoidance of most sensitive habitats where possible, visual and sound screening, works near sensitive habitats timed for late Summer/early Autumn to avoid key periods of dependence on on-site habitats and along the estuary. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Minor negative	Significant at local level	Certain, subject to adherence to control measures
		Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at district level	Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat; enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new on-site wetland habitats including saltmarsh and reedbed, delivered through the GIS and EMMF.	Moderate positive	Significant at district level	Uncertain at this stage, subject to securing the correct compensation land
Wintering terrestrial bird assemblage	County	Visual and aural disturbance	Temporary, moderate magnitude and extent	Significant at district level	Sensitive construction methodology delivered through the EMMF, including: avoidance of most sensitive habitats/time periods and provision of visual and sound screening where possible. Schedule 1 disturbance licence to permit otherwise unlawful activities for works near habitats supporting Schedule 1 birds	Minor negative	Significant at local level	Certain, subject to adherence to control measures
		Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at district level	Enhancement of retained grassland and scrub habitats. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat including reedbed suitable for marsh harrier and Cetti's warbler, delivered through the EMMF.	Moderate positive	Significant at district level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Breeding Bird Assemblage	County	Visual and aural disturbance	Temporary, moderate magnitude and extent	Significant at district level	Sensitive construction methodology delivered through the CEMP and EMMF, including: EPZs formed around sensitive habitat features and areas used by WCA Schedule 1 species, works timed for outside of the peak breeding season or under supervision of a Suitably Qualified Ecologist (SQE).	Minor negative	Significant at local level	Certain, subject to adherence to control measures
		Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at district level	Enhancement of retained grassland and scrub habitats. Provision of nesting features within the fabric of the development. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat including reedbed suitable for marsh harrier, bearded tit and Cetti's warbler, scrapes and grazing marsh, delivered through the EMMF.	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
Bat Assemblage	Local	Direct loss and fragmentation of foraging and roosting habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained grassland and scrub habitats, creation of linear landscape features. Provision of roosting features within the fabric of the development. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat. Delivered through the EMMF	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Light pollution of retained roosts and commuting routes	Temporary, moderate magnitude and extent	Significant at local level	Sensitive lighting strategy developed and delivered through the EMMF.	Minor negative	Not significant	Certain, subject to adherence to control measures
Dormouse	District	Visual, physical and aural disturbance	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the CEMP and EMMF, including: EPZs formed around sensitive habitat features and areas used by dormice, works timed for outside of the active season or under supervision of an SQE.	Minor negative	Not significant	Certain, subject to adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Direct loss and fragmentation of scrub habitat	Permanent, major magnitude and extent	Significant at district level	Enhancement of retained scrub habitats to include greater species diversity and structure. New landscape planting to maintain and enhance links with wider landscape, primarily along Pilgrim's Way. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Otter	Local	Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained wetland habitats, creation of new reedbed, ditches and saltmarsh. Provision of holt building opportunities or artificial holts. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat. Delivered through the EMMF and GIS.	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Visual and aural disturbance	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the CEMP and EMMF, including: EPZs formed around sensitive habitat features and areas used by otters.	Negligible	Not significant	Certain, subject to adherence to control measures
		Light pollution	Temporary, minor magnitude and extent	Significant at local level	Sensitive lighting strategy developed and delivered through the EMMF.	Negligible	Not significant	Certain, subject to adherence to control measures
Water Vole	Local to district	Direct loss and fragmentation of habitat	Permanent, moderate magnitude and extent	Significant at local level	Enhancement of retained wetland habitats (including Botany Marsh where core population exists), creation of new reedbed and ditches connecting retained wetlands. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat. Delivered through the EMMF and GIS	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Visual and aural disturbance	Temporary, minor magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the CEMP and ECMS, including: EPZs formed around sensitive habitat features and areas used by water voles.	Negligible	Not significant	Certain, subject to adherence to control measures

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Harvest Mouse	Local	Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained scrub and grassland habitats and commencement of management regime. Creation of new seed, fruit and invertebrate rich scrub and grassland habitat around the development periphery. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat. Delivered through the EMMF and GIS.	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy; off-site compensation land uncertain at this stage
		Visual, physical and aural disturbance	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the CEMP and EMMF, including: EPZs formed around sensitive habitat features and areas used by harvest mouse.	Negligible	Not significant	Certain, subject to adherence to control measures
Amphibian assemblage	Local to district	Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained wetland features, creation of new periphery ditch and reedbed, creation of new ponds and remediation of contaminated waterbodies. Creation of additional open water areas within retained reedbed. Provision of biodiversity offsetting scheme providing compensation for loss of wetland habitat. Delivered through EMMF and GIS.	Minor positive	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy
		Visual, physical and aural disturbance	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the CEMP and EMMF, including: EPZs formed around sensitive wetland habitat features.	Negligible	Not significant	Certain, subject to adherence to control measures
Reptile assemblage	District	Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at local level	Enhancement of retained grassland scrub features, creation of new reedbed, saltmarsh and hibernation features. Commencement of sensitive management regime. Delivered through the EMMF.	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Visual, physical and aural disturbance	Temporary, moderate magnitude and extent	Significant at local level	Sensitive construction methodology delivered through the CEMP and EMMF, including: EPZs formed around sensitive habitat features and areas used by reptiles.	Negligible	Not significant	Certain, subject to adherence to control measures
Terrestrial Invertebrates	National	Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at national level	Enhancement of retained grassland scrub features, creation of new reedbed, saltmarsh and species-specific habitat features. Commencement of sensitive management regime. Delivered through the EMMF.	Moderate negative	Significant at county level	Certain, subject to further developed Green Infrastructure Strategy
		Habitat degradation	Temporary, minor to major magnitude and extent, reversible	Significant at district level	Commencement of sensitive management regime, and appropriate recreational management. Delivered through the EMMF.	Negligible	Not significant	Certain, subject to adherence to control measures
		Light pollution	Temporary, moderate magnitude and extent	Significant at local level	Sensitive lighting strategy developed and delivered through the EMMF.	Minor negative	Not significant	Certain, subject to adherence to control measures
Aquatic Invertebrates	County to regional	Direct loss and fragmentation of habitat	Permanent, major magnitude and extent	Significant at county level	Enhancement and remediation of retained wetland, creation of new reedbed, ponds, saltmarsh and species-specific habitat features. Commencement of sensitive management regime. Delivered through the EMMF.	Minor positive	Significant at district level	Certain, subject to further developed Green Infrastructure Strategy
		Habitat degradation	Temporary, minor to major magnitude and extent, reversible	Significant at district level	Commencement of sensitive management regime, and appropriate recreational management. Delivered through the EMMF.	Negligible	Not significant	Certain, subject to adherence to control measures
Operational Phase								
Designations								
Thames Estuary and Marshes SPA/Ramsar	International	Increased visual and aural disturbance of functionally linked ecosystems by increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Minor negative	Not significant	Uncertain

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Increased recreational disturbance of functionally linked ecosystems	Permanent, minor magnitude and extent	Significant at district level	Re-routing and screening of existing PRoW to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Delivered through the GIS	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Medway Estuary and Marshes SPA/Ramsar/ SSSI	International	Increased visual and aural disturbance of functionally linked ecosystems by increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Minor negative	Not significant	Uncertain
		Increased recreational disturbance of functionally linked ecosystems	Permanent, minor magnitude and extent	Significant at district level	Re-routing and screening of existing PRoW to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Delivered through the GIS	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Darenth Woods SSSI	National	Increased air pollution from increased traffic along A2	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Negligible	Not significant	Certain
Rainham Marshes SSSI	National	Increased visual and aural disturbance of functionally linked ecosystems by increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Minor negative	Not significant	Uncertain
		Increased recreational disturbance of functionally linked ecosystems	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRoW to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Delivered through the GIS	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
South Thames Estuary and Marshes SSSI	National	Increased visual and aural disturbance of functionally linked ecosystems by increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Minor negative	Not significant	Uncertain

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Increased recreational disturbance of functionally linked ecosystems	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRoW to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Delivered through the GIS	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
West Thurrock Lagoon and Marshes SSSI	National	Increased visual and aural disturbance of functionally linked ecosystems by increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Minor negative	Not significant	Uncertain
		Increased recreational disturbance of functionally linked ecosystems	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRoW to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Delivered through the GIS	Negligible	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Botany Marshes LWS	County	Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Educational boards placed to increase public awareness, maintenance of defined routes. Delivered through the GIS	Negligible	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased visual and aural disturbance from resort	Permanent, moderate magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Significant at local level	Certain, subject to further developed Green Infrastructure Strategy
Ebbsfleet Marshes, Northfleet LWS	County	Increased visual and aural disturbance from new road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen habitat from road, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Alkerden Lane Pit LWS	County	Increased recreational disturbance	Permanent, minor magnitude and extent	Not significant	Appropriate management of onsite recreational activity. Delivered through the GIS and EMMF	Negligible	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Tilbury Marshes LWS	County	Increased visual and aural disturbance by increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Negligible	Not significant	Uncertain

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Habitats/Flora								
Populations of nationally scarce plants	National	Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at district level	Maintenance of defined routes through retained habitats, installation of educational boards, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP
Broad leaved Semi Natural Woodland	Local	Increased air pollution due to increased traffic along A2	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Negligible	Not significant	Certain
Scrub	Local	Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Maintenance of defined routes through retained habitats, installation of educational boards, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP
Semi-improved grassland	Local to district	Litter pollution	Permanent, minor magnitude and extent	Significant at local level	Installation of adequate litter disposal along defined routes, regular litter removal during maintenance, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP
		Recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Maintenance of defined routes through retained habitats, installation of educational boards, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP
Open mosaic on previously developed land	District	Recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Maintenance of defined routes through retained habitats, installation of educational boards, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Waterbodies (ponds, standing water and ditch network)	District	Litter and chemical pollution	Permanent, minor magnitude and extent	Significant at local level	Installation of adequate litter disposal along defined routes, regular litter removal during maintenance, delivered through the GIS and EMMF. Development of sustainable drainage strategy to avoid road run-off passing directly into waterbodies.	Minor negative	Not significant	Certain, subject to adherence to control measures
Swamp (reedbed)	County	Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRow to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP
		Litter and chemical pollution	Permanent, minor magnitude and extent	Significant at local level	Installation of adequate litter disposal along defined routes, regular litter removal during maintenance, delivered through the GIS and EMMF. Development of sustainable drainage strategy to avoid road run-off passing directly into waterbodies.	Minor negative	Not significant	Certain, subject to adherence to control measures
River Ebbsfleet	Local	Increased visual and aural disturbance due to new road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen habitat from road, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy, and adherence to control measures in LEMP
		Litter and chemical pollution	Permanent, minor magnitude and extent	Significant at local level	Installation of adequate litter disposal along defined routes, regular litter removal during maintenance, delivered through the GIS and EMMF. Development of sustainable drainage strategy to avoid road run-off passing directly into waterbodies.	Minor negative	Not significant	Certain, subject to adherence to control measures
Species								
Wintering waterfowl and wading bird assemblage	International	Increased visual and aural disturbance from increased river traffic	Permanent, minor magnitude and extent	Not significant	No additional mitigation	Minor negative	Not significant	Uncertain

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at district level	Re-routing and screening of existing PRow to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Wintering terrestrial bird assemblage	County	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRow to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Breeding Bird Assemblage	County	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRow to avoid sensitive areas for birds, creation of new bird hides at key observation locations to reduce visual impact. Creation of defined routes through terrestrial habitats. Provision of educational boards. Delivered through the GIS and EMMF	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Bat assemblage	Local	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Light pollution	Permanent, minor magnitude and extent	Significant at local level	Development of sensitive lighting scheme, including the use of low-level lighting, louvres etc. and avoiding lighting on sensitive habitat features.	Minor negative	Significant at local level	Uncertain, subject to design/extent of lighting at night

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Dormouse	District	Increased visual and aural disturbance from resort and new road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Creation of defined routes through retained habitats. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Light pollution	Permanent, minor magnitude and extent	Significant at local level	Development of sensitive lighting scheme, including the use of low-level lighting, louvres etc. and avoiding lighting on sensitive habitat features.	Minor negative	Not significant	Uncertain, subject to design/extent of lighting at night
Otter	Local	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRoW from estuary and Black Duck Marsh to avoid sensitive areas for otters, creation of new hides at key observation locations to reduce visual impact. Creation of defined routes through terrestrial habitats. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Light pollution	Permanent, minor magnitude and extent	Significant at local level	Development of sensitive lighting scheme, including the use of low-level lighting, louvres etc. and avoiding lighting on sensitive habitat features.	Minor negative	Not significant	Uncertain, subject to design/extent of lighting at night
Water Vole	Local to district	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Maintenance of defined routes through Botany Marsh and new wetland habitat and provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Harvest Mouse	Local	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Creation of defined routes through retained habitats. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Amphibian assemblage	Local to district	Increased visual and aural disturbance from resort	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Re-routing and screening of existing PRoW from Black Duck Marsh to avoid key sensitive areas, creation of new hides at key observation locations to reduce visual impact on wetland. Creation of defined routes through terrestrial habitats. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Chemical pollution of habitat	Permanent, minor magnitude and extent	Significant at local level	Development of sustainable drainage strategy to avoid road run-off passing directly into waterbodies.	Minor negative	Not significant	Certain, subject to adoption and implementation of suitable drainage strategy
Reptile assemblage	District	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Increased recreational disturbance	Permanent, minor magnitude and extent	Significant at local level	Creation of defined routes through retained habitats. Provision of educational boards. Delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
Terrestrial Invertebrates	National	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Aquatic Invertebrates	County to regional	Increased visual and aural disturbance from resort and road	Permanent, minor magnitude and extent	Significant at local level	New landscape planting to screen from the development, delivered through the GIS and EMMF.	Minor negative	Not significant	Certain, subject to further developed Green Infrastructure Strategy
		Chemical pollution of habitat	Permanent, minor magnitude and extent	Significant at local level	Development of sustainable drainage strategy to avoid road run-off passing directly into waterbodies.	Minor negative	Not significant	Certain, subject to adoption and implementation of suitable drainage strategy