

9. TERRESTRIAL ECOLOGY

9.1 Introduction

9.1.1 This chapter assesses the impacts of the Scheme on Terrestrial Ecology and Nature Conservation. Ecological receptors have been identified and assessed within a zone of influence that includes the Limits of Land to be Used or Acquired (LLAU). The ecological baseline has been established through desk studies and appropriate survey work. Surveys include an extended Phase 1 habitat survey and dedicated surveys for terrestrial invertebrates, reptiles, black redstart (*Phoenicurus ochrurus*) and roosting bats.

9.1.2 All drawings referenced within this chapter are presented in Volume 2 of the PEIR and all appendices referenced in this chapter are presented in Volume 3.

9.2 Regulatory and policy framework

9.2.1 This impact assessment has been undertaken in accordance with current international and national legislation, and national, regional and local plans and policies relating to nature conservation in the context of the Scheme. A summary of the relevant legislation and policies, the requirements of these policies and the Scheme response has been provided in Table 9-1 below.

Table 9-1 Terrestrial ecology regulatory and policy framework

Policy/legislation	Summary of requirements	Scheme response
<p>National Policy Statement for National Networks (NN NPS)</p>	<p>NN NPS aims to reduce overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks.</p> <p>It states that applications accompanied by an Environmental Impact Assessment (EIA) applications should show how the project has taken advantage of opportunities to conserve and enhance biodiversity interests.</p> <p>Chapter 5 of the NN NPS has a section on <i>Land use including open space, green infrastructure and Green Belt</i>, where it states:</p> <p><i>‘Where networks of green infrastructure have been identified in development plans, they should normally be protected from development, and, where possible, strengthened by or integrated within it. The value of linear infrastructure and its footprint in supporting biodiversity and ecosystems should also be taken into account when assessing the impact on green infrastructure.’</i></p>	<p>Mitigation has been incorporated into the Scheme design to reduce impacts on significant ecological receptors. Further mitigation is proposed and will be developed with the aim of ensuring no overall net loss of biodiversity and the provision of connected ecological networks.</p>

Policy/legislation	Summary of requirements	Scheme response
<p>Conservation of Habitats and Species (amendment) Regulations 2010, as amended ('Habitats Regulations')</p>	<p>The Habitats Regulations provide for the designation of both Special Protection Areas (SPAs) (first established under the Birds Directive, 1979) and Special Areas for Conservation (SACs) as part of the Natura 2000 network of protected areas across Europe.</p> <p>The Habitats Regulations also provide protection for European Protected Species (EPS) from deliberate capture, killing or disturbance. It is also an absolute offence to destroy or damage the resting site or breeding site of an EPS.</p>	<p>A Habitats Regulations Assessment (HRA) report has evaluated the potential impacts of the Scheme on Natura 2000 sites within 5km of the Scheme (extended to 30km for SACs designated for bats) (Volume 3 of the PEIR, Appendix 9.C: Habitats Regulations Assessment Report) and found there to be no likely significant effect due to the Scheme.</p> <p>A desk study has identified records of European protected species within 2km of the LLAU.</p> <p>On-site surveys have been undertaken to assess the presence/likely absence of EPS on the site. No EPS will be affected by the Scheme.</p>
<p>The Birds Directive 1979 as amended (79/409/EEC)</p>	<p>Bird species listed in Annex I of the Directive regularly occur in Britain but are protected under EU law. The Directive requires member countries to classify as SPAs the most suitable sites for these species and also for all regularly occurring migratory species. It also includes provisions for the maintenance of the favourable conservation status of all wild bird species across their distributional range.</p>	<p>A Habitats Regulations Assessment (HRA) report has evaluated the potential impacts of the Scheme on Natura 2000 sites, including those designated for birds (SPAs), within 5km of the Scheme (Appendix 9.C: Habitats Regulations Assessment Report) and found there to be no likely significant effect due to the Scheme.</p>

Policy/legislation	Summary of requirements	Scheme response
The Habitats Directive 1992	The Habitats Directive 1992 is European Council legislation. Annex II of the Directive lists the European protected species that are afforded special protection under this Directive. The provisions of the Habitats Directive were transposed into English law by the Conservation of Habitats and Species Regulations 2010	
The Wildlife and Countryside Act 1981 (as amended)	<p>The Act provides for the designation of Sites of Special Scientific Interest (SSSI), which are selected as the best national examples of habitat types, sites with notable species and sites of geological importance.</p> <p>Section 1 of the Act provides for the protection of wild birds, their nests and their eggs, with special protection given to those species listed in Schedule 1, which includes black redstart. Full protection is given under Section 9 of the Act to certain animals listed in Schedule 5, including all species of bat. Partial protection under Section 9 is given to certain other species, including all widespread species of reptile. Section 13 of the Act details protection for plants and fungi listed in Schedule 8.</p>	<p>Potential impacts on nationally protected sites (SSSIs) and species have been evaluated as part of this assessment through a desk study to identify all SSSIs and records of nationally protected species within 2km of the LLAU.</p> <p>On-site surveys have been undertaken to assess the presence/likely absence of nationally protected species on the site. Where likely absence cannot be confirmed, specific mitigation has/will be incorporated into the Scheme design.</p>

Policy/legislation	Summary of requirements	Scheme response
Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) Schedule 9 (animals and plants to which section 14 applies)	Schedule 9 of the Wildlife and Countryside Act 1981 provides a list of non-native invasive species. It is an offence, which, under section 14 of the Act, makes it an offence to allow to plant or otherwise cause to grow in the wild any plant which is included in Part II of Schedule 9.	On-site surveys have been undertaken to assess the presence/likely absence of species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) on the site. Where any are recorded, specific mitigation has/will be incorporated into the Scheme design.
Environmental Protection Act 1990 (as amended)	The Act makes it an offence to consign or dispose of Japanese Knotweed (<i>Fallopia japonica</i>) in a way that contravenes the waste regulations.	On-site surveys have been undertaken to assess the presence/likely absence of Japanese Knotweed on the site. Where it is recorded, specific mitigation has/will be incorporated into the Scheme design.
Protection of Badgers Act 1992	The Act consolidates the legislation specific to badgers. The Act makes it an offence to wilfully take, kill, injure or ill-treat a badger; to obstruct, destroy, or damage in any part, a badger's sett; or to disturb badgers within a sett.	On-site surveys have been undertaken to assess the presence/likely absence of badger on the site.
Countryside and Rights of Way Act 2000	The Act gives greater protection to SSSIs and strengthens wildlife enforcement legislation by the introduction of the offence of 'recklessness' in the damage/destruction or obstruction of the places of shelter or rest of protected species and the disturbance of these species within such places.	Potential impacts on nationally protected sites (SSSIs) and species have been evaluated as part of this assessment through a desk study to identify all SSSIs and records of nationally protected species within 2km of the LLAU.

Policy/legislation	Summary of requirements	Scheme response
	<p>The Act also requires Government Departments to have regard to biodiversity and conservation; Section 74 of the Act requires lists of habitats and species of Principal Importance to be produced, for which conservation steps should be taken or promoted. The requirement to prepare such lists of habitats and species was extended by the Natural Environment and Rural Communities (NERC) Act 2006 (see below).</p>	<p>On-site surveys have been undertaken to assess the presence/likely absence of nationally protected species on the site. Where likely absence cannot be confirmed, specific mitigation will be incorporated into the Scheme design.</p>
<p>Natural Environment and Rural Communities (NERC) Act 2006</p>	<p>The NERC Act places a duty upon public bodies to consider enhancement of biodiversity within all of their actions. Sections 40 and 41 of the NERC Act superseded Section 74 of the Countryside and Rights of Way Act 2000. Section 41 lists flora, fauna and habitats considered by the Secretary of State to be of Principal Importance for conserving biodiversity in England.</p> <p>In addition, the NERC Act provides for those species that were previously identified within the UK Biodiversity Action Plan (BAP) and the relevant Local BAPs as biodiversity conservation priorities. The UK BAP has been superseded by</p>	<p>Potential impacts on habitats and species listed under Section 41 of the NERC Act have been evaluated as part of this assessment through a desk study to identify records of these species within 2km of the LLAU.</p> <p>On-site surveys have been undertaken to assess the presence/likely absence of species listed under Section 41 of the NERC Act on the site. Where likely absence cannot be confirmed, specific mitigation will be incorporated into the Scheme design.</p> <p>Measures to enhance the biodiversity value of the Site will be incorporated into the design.</p>

Policy/legislation	Summary of requirements	Scheme response
	Biodiversity 2020: A strategy for England's Wildlife and Ecosystem Services) (see below).	
Birds of Conservation Concern (BoCC) (Based on Eaton <i>et al</i> , 2009) (Ref 9-1)	<p>The UK's birds can be split into three categories of conservation importance – red, amber and green.</p> <p>Red is the highest conservation priority, with species needing urgent action. Amber is the next most critical group, followed by green.</p> <p>The criteria used in assessments are intended to ensure that BoCC listings reflect each species' global and European status as well as that within the UK, and additionally measure the importance of the UK population in international terms.</p>	<p>Potential impacts on amber or red listed birds within the BoCC have been evaluated as part of this assessment through a desk study to identify records of these species within 2km of the LLAU.</p> <p>On-site surveys have been undertaken to assess the presence/likely absence of amber or red listed birds within the BoCC on the site. Where likely absence cannot be confirmed, specific mitigation will be incorporated into the Scheme design.</p>
Red Data Book (Ref 9-2)	The Red Data Book species are a list of species that are at risk of extinction based on Shire, 1997 and International Union for Conservation of Nature (IUCN) criteria	<p>Potential impacts on Red Data Book species have been evaluated as part of this assessment through a desk study to identify records of these species within 2km of the LLAU.</p> <p>On-site surveys have been undertaken to assess the presence/likely absence of Red Data Book species on the site. Where likely absence cannot be confirmed, specific mitigation will be incorporated into the Scheme design.</p>

Policy/legislation	Summary of requirements	Scheme response
<p>National Planning Policy Framework (NPPF)</p>	<p>The NPPF sets out how the planning system should protect and enhance nature conservation interests.</p> <p>Section 11 is concerned with conserving and enhancing the natural environment and states that the planning system should achieve this by <i>'minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity'. When determining planning applications, it states that local planning authorities should aim to conserve and enhance biodiversity and to refuse planning permission 'if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for'</i> with regard to any protection afforded to sites, habitats and species.</p> <p>Planning and mitigation should recognise the wider benefits of ecosystem services and establishment of ecological networks to build in an element of resilience for our native species</p>	<p>The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.</p> <p>The Scheme will aim to ensure that connected green networks that provide a suite of ecosystem services such as flood alleviation and recreation value are created.</p>

Policy/legislation	Summary of requirements	Scheme response
	and habitats. Opportunities to enhance biodiversity are also encouraged.	
National Planning Practice Guidance (NPPG)	NPPG provides that the planning system should contribute to and enhance the natural and local environment, minimise pollution and other adverse effects on the local and natural environment and minimise impacts on biodiversity. NPPG underpins the NPPF.	The Scheme will aim to ensure that connected green networks that provide a suite of ecosystem services such as flood alleviation and recreation value are created. The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.
Biodiversity 2020: A strategy for England's Wildlife and Ecosystem Services	The Strategy aims to halt the loss of biodiversity, support healthy ecosystems and establish coherent ecological networks.	The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.
The London Plan (2011)	Regional planning policy for London is presented in the London Plan: Spatial Development Strategy for Greater London. It contains various policies with regard to nature conservation in London, which include commitments to protect, enhance, create, promote, expand and manage	The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.

Policy/legislation	Summary of requirements	Scheme response
	the extent and quality of green infrastructure and biodiversity and to increase access to nature.	
The Mayor's Biodiversity Strategy (2002)	Connecting with London's Nature: The Mayor's Biodiversity Strategy provides a statutory framework for the delivery of biodiversity policies in London. It seeks to ensure that there is no overall loss of wildlife habitats in London.	The ecological baseline has been assessed through a desk study and specific surveys. Any impacts that the Scheme may have on the wildlife habitats on the Site will be avoided or mitigated.
London Bio-diversity Action Plan (BAP)	Managed by the London Biodiversity Partnership (2006), the London BAP sets out priority habitats and species for the city. London BAP habitats relevant to the Scheme include reedbeds, standing water and wasteland.	The presence/likely absence of habitats and species listed under the London BAP have been evaluated through a desk study and specific surveys. Potential impacts on reedbeds, standing water and wasteland will be mitigated by replacement waterbodies as mitigation.
Newham's Biodiversity Resource: Evidence Base For The Local Development Framework (May 2010)	This is the BAP for the London Borough of Newham. The action plan lists a number of habitats and species within Newham for which targets have been set to increase their range and distribution. Several such species are relevant to the Site, including bees (as a group) and butterflies (as a group).	The presence/likely absence of habitats and species listed under the Newham BAP have been evaluated through a desk study and specific surveys. Potential impacts on invertebrates will be mitigated as part of the Scheme design.

Policy/legislation	Summary of requirements	Scheme response
Greenwich Bio-diversity Action Plan (BAP) (March 2010)	The Greenwich BAP aims to achieve the targets relevant to the Royal Borough of Greenwich identified in both the UK and London BAP. The action plan lists a number of habitats and species within Greenwich for which targets have been set to increase their range and distribution. Species listed that are relevant to the Site include black redstart.	The presence/likely absence of habitats and species listed under the Greenwich BAP have been evaluated through a desk study and specific surveys. Potential impacts on invertebrates will be mitigated as part of the Scheme design.
London Invasive Species Initiative (LISI)	Also managed by the London Biodiversity Partnership, LISI lists non-native invasive species that should be controlled in London.	The presence/likely absence of plants and animals listed by LISI have been taken account when assessing the potential impacts of the Scheme. Where present, appropriate mitigation to control the species has/will be incorporated into the Scheme.
London Borough of Newham Core Strategy (2013) Policy SC4	Biodiversity will be protected and enhanced, with developments providing net gains in Newham's natural environment. Developments will have help to achieve Newham's BAP targets and avoid adverse impacts on species and habitats. Sites of importance for Nature Conservation (SINCs) will be protected, and green infrastructure such as living roofs, landscaping and tree planting will be incorporated.	The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through a desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.

Policy/legislation	Summary of requirements	Scheme response
<p>Royal Borough of Greenwich Core Strategy (2014)</p> <p>Policy OS4</p> <p>Policy OS(f)</p>	<p>Biodiversity will be protected, restored and enhanced, including Greenwich BAP species and habitats. Designated sites will be protected.</p> <p>Biodiversity enhancements will be encouraged, especially in areas already deficient in biodiversity.</p> <p>Development proposals will need to take into account ecological factors including the biodiversity of the site and surrounding area.</p>	<p>The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity. The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.</p> <p>An arboricultural survey will be undertaken to evaluate the arboricultural impact of the Scheme and to ensure retained trees are protected appropriately throughout the Scheme.</p> <p>The Scheme will aim to use native species planting and provide connected green infrastructure.</p>
<p>Tower Hamlets Core Strategy (2010)</p> <p>Policy SO12</p> <p>Policy SP04</p>	<p>Policy SO12 aims to create a high-quality, well-connected and sustainable natural environment of green and blue spaces that are rich in biodiversity and promote active and healthy lifestyles.</p> <p>Policy SP04 looks to deliver a network of green spaces by protecting and safeguarding open</p>	<p>The Scheme aims to conserve and enhance the biodiversity value of the Site by identifying all potential ecological impacts, through a desk study and on-site survey, and either avoid or mitigate them, and to build in additional features to benefit biodiversity.</p>

Policy/legislation	Summary of requirements	Scheme response
	green space, ensuring there is no net loss and to create, enhance and connect publicly accessible open space.	

9.3 Methodology

General approach

- 9.3.1 The impact on Terrestrial Ecology is being assessed in accordance with the 2006 Guidelines on Ecological Impact Assessment in the United Kingdom produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) (Ref 9-3). These determine which ecological receptors are significant within a geographical context before the assessment of the impacts of the Scheme on significant receptors is undertaken.

Consultation

- 9.3.2 Consultation has been undertaken with Natural England, the Environment Agency and the London Wildlife Trust. The purpose of the consultation has been to agree ecological survey requirements and the assessment methodology to be used (including the mitigation measures proposed).

Biological records

- 9.3.3 A data request was sent to Greenspace Information for Greater London (GiGL) to obtain records of any important sites, habitats and species in the study area. In addition, Natural England's online tool, the Multi-Agency Geographical Information System (MAGIC) (www.magic.gov.uk) was used to further check for statutory designated sites within 2km of the Site (extended to 5km for Natura 2000 sites).

The study area - zone of influence

- 9.3.4 The zone of influence is defined as the area in which there may be receptors subject to impact as a result of the Scheme. Such receptors could be affected directly, e.g. works affecting a receptor within the Site such as removal of a building occupied by bats, or indirectly, e.g. a designated site downriver of a development being affected by sediment deposition, etc.
- 9.3.5 The zone of influence is ascertained through considerations of the likely construction and operation phase impacts, taking into account the desk study, an examination of mapping data, responses from consultees and records of protected species, and from the findings of the survey work.

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- 9.3.6 The CIEEM 'Guidelines for Ecological Impact Assessment' (2006) (Ref 9-3) require the assessment to be focussed on 'the zone of influence' specific to individual habitats or species. Therefore, while the majority of impacts will be experienced directly as a result of land take within the LLAU (i.e. habitat loss); indirect effects could be experienced further afield. The predicted zone of influence is stated in Section 9.4.

Potential indirect effects on the River Thames and Tidal Tributaries SINC (e.g. through impacts on local water quality) on receptors from the Scheme will be evaluated in Chapter 10: Marine Ecology.

The Greenwich Peninsula Ecology Park, Bow Creek Ecology Park, East India Dock Basin and the Royal are not likely to be directly affected as they are separated from the site by at least 0.2km, are isolated from the Site by non-ecological infrastructure such as roads and buildings and are not hydrologically connected.

Methodology for establishing baseline conditions

Desk study

- 9.3.7 The existing baseline has been established through both desk study data analyses and field surveys.
- 9.3.8 A desk study has been undertaken to determine likely ecological issues associated with the Scheme. This has included:
- a review of aerial photographs to identify valuable habitats such as mudflats and ponds close to or within the LLAU.
 - a web-based desk-review for the Scheme area and surrounding area up to a distance of 2km from the boundary of the Scheme (extended to 5km for Natura 2000 sites was undertaken. The requirement to extend the study to 30km for SACs designated for bats is solely for the Habitats Regulations Assessment (Volume 3, Appendix 9.C) and has been addressed in that document). MAGIC was used to search for statutory designated sites of nature conservation value within 2km of the Site (5km for Natura 2000 sites). In addition, the Local Biodiversity Action Plan (LBAP) for London (London Biodiversity Partnership BAP), for Newham (Newham Biodiversity Action Plan) and for Greenwich (Greenwich Biodiversity Action Plan) were reviewed with reference to the potential value of habitats and species present, or likely to be present, within or adjacent to the Site.

- data was purchased from GiGL for non-statutory sites, protected species and species of conservation concern within 2km of the most up-to-date LLAU at the time.
- the review of reports from previous stages of the Scheme development, that include some ecological baseline analysis.

Field survey

9.3.9 An extended Phase 1 habitat survey of the Site (Silvertown and Greenwich) (JNCC, 2010) was undertaken on 6th November 2013 and 17th March 2014. This comprised a walkover search of the Site to identify any habitats likely to be of conservation value, and to investigate the presence (or likely presence) of protected species of plants and/or animals. Target Notes of important ecological features are shown on the Phase 1 Habitat Survey Sheets 1 and 2 (Drawing 9.3) and descriptions and further detail are provided in Appendix 9.A to this report. This survey identified the following further surveys that have now been undertaken:

- targeted reptile surveys at selected locations within the Site (Silvertown and Greenwich);
- targeted black redstart surveys within the Site (Silvertown and Greenwich);
- dusk emergence bat survey at a selected location (Silvertown); and
- targeted terrestrial invertebrate surveys at selected locations within the Site (Silvertown and Greenwich).

Reptile survey methods

9.3.10 The presence of reptiles was investigated in May and June 2014 by the placing of artificial refuges (sheets of roofing felt, approximately 1m x 1m) at 10m intervals in selected locations within the Site (Silvertown and Greenwich). The refuges were placed at a density of at least ten per hectare, following the guidance of Reptile Survey Methods (Ref 9-4).

9.3.11 Twenty refuges were placed adjacent to the Docklands Light Railway (DLR) line, north of Scarab Close, Silvertown, in suitable habitat at the edge of Bramble scrub and within tall ruderal herbs. Ten refuges were placed on a road verge adjacent to the Blackwall Tunnel Approach/A102 in suitable habitat which comprised unmanaged grassland. Silvertown refuges were checked in suitable weather conditions on six occasions

between May and mid-July 2014. Greenwich refuges were checked in suitable weather conditions on three occasions throughout May 2014. A June visit to Greenwich revealed that the vegetation along the road verge adjacent to the Blackwall Tunnel Approach/A102 had been cut to a uniform sward height of approximately 10cm, rendering this location unsuitable for use by reptiles. Therefore, no additional surveys were undertaken at Greenwich in June 2014.

- 9.3.12 Due to the time of year, refuge checks were carried out early in the mornings when any reptiles present were likely to be basking. On each occasion, surveyors also searched for basking reptiles whilst moving between the artificial refuges.

Black redstart survey methods

- 9.3.13 The entire Site at Silvertown was considered suitable for use by breeding black redstarts. Suitable black redstart breeding habitat at Greenwich was confined to the gas works structure and The O2, and therefore survey effort was concentrated at these selected locations.
- 9.3.14 Targeted black redstart surveys were undertaken which followed the methodology of Gilbert et al. (1998). This stipulates that five survey visits are undertaken during the breeding season (mid-April to late-June) during the hours after sunrise and/or the hours before sunset. These surveys were intended to identify black redstart breeding territories and locate nesting sites (if present).
- 9.3.15 During each survey, a predetermined route was walked at Silvertown and the selected locations at Greenwich, alternating the direction of the route on each visit to ensure that surveyors were not always starting and ending at the same location. Transects were walked slowly, taking time to stop and listen for singing birds or to observe any suspected sightings through binoculars. Any black redstarts heard or seen were further investigated to ascertain their precise location.

Bat survey methods

- 9.3.16 A dusk emergence bat survey was undertaken in suitable weather conditions on 12 May 2014 at ASD Metals, Silvertown. Features suitable for use by roosting bats had been previously identified; crevices in the brick work and fascia boarding on the south-west and south-east side of the main building on the Site.

9.3.17 The survey was undertaken in accordance with Bat Conservation Trust (BCT) guidelines (Ref 9-5) by two experienced bat surveyors using broadband (time expansion) bat detectors, allowing bat calls to be recorded for subsequent identification. Surveyors were in place half an hour before sunset, remaining until it was too dark to determine whether bats were emerging from the building (by this time any bats present are likely to have emerged). Activity surveys are ongoing and impacts on bats will be evaluated in the ES.

Invertebrate survey methods

9.3.18 Terrestrial invertebrate surveys, which included sweep-netting, beating and suction sampling were undertaken in targeted locations at Silvertown and Greenwich. The use of pitfall traps was considered but was physically impractical for multiple reasons including likelihood of damage to traps, treacherous or unavailable access, no soft ground to install etc. The techniques are described below:

- sweep-netting: A stout hand-held net is moved vigorously through vegetation to dislodge resting insects. The technique may be used semi-quantitatively by timing the number of sweeps through vegetation of a similar type and counting selected groups of species.
- beating trees and bushes: A cloth tray, held on a folding frame, is positioned below branches of trees or bushes and these are sharply tapped with a stick to dislodge insects. Black or white trays are used depending upon which group of invertebrates has been targeted for search. Insects are collected from the tray using a pooter – a mouth-operated suction device.
- suction sampling consists of using a converted leaf blower to collect samples from grass and other longer ground vegetation. The sample is then everted into a net bag and the invertebrates removed with a pooter. The advantage of suction sampling is that it catches species, which do not fly readily or which live in deep vegetation. It is particularly productive for Coleoptera, some Diptera and Arachnida.

Forecasting the future baseline ('Without Scheme' scenario)

9.3.19 The future baseline is assessed through analysing the potential impact that consented developments (listed in Table 9-5 Cumulative Impacts) might have on the Site, as well as reviewing published sources on

possible future changes to populations through changes in climate or other causes.

- 9.3.20 This is combined with inferred natural ecological changes that are likely to occur, such as succession.

Impact assessment methodology

- 9.3.21 The CIEEM (2006) Guidelines (Ref 9-3), in combination with DMRB Volume 11 Section 2, Part 5, Volume 11 Section 3 Part 4 (Highways Agency, 1993) (Ref 9-6) and Interim Advice Note 130/10 (Highways Agency, 2010) (Ref 9-7) form the basis of the ecological assessment methodology which has been agreed with statutory bodies via the EIA scoping process.

Zone of influence

The Zone of Influence (Zol) describes the area over which the activities associated with the Scheme could influence ecological resources. This will be established on the basis of a desk-based review of ecological resources in the general vicinity of the application site, together with the results of field surveys, a review of the likely impact parameters associated with the Scheme, and the outcomes of the consultation exercise. As with the study area, the Zol varies with each species/species group identified as a potential Key Ecological Receptor.

Evaluation

- 9.3.22 There are many components considered when evaluating an ecological receptor. Table 9-2 and Table 9-3 below outline the factors taken into consideration for both habitats and species, adapted from Ratcliffe (1977) (Ref 9-8). A review of legislation, policy and sensitivity of the receptor is undertaken and the value of the receptor is assessed within a geographical context using the criteria provided in Table 9-2.
- 9.3.23 In order to determine the likelihood of a significant effect, it will first be necessary to identify whether a receptor is sufficiently valuable for any impact upon it to be able to generate a significant effect. To achieve this, where possible, habitats, species and populations will be valued on the basis of a combination of their rarity, status and distribution, using contextual information where it exists. The following frame of reference for the valuation of ecological resources will be used:

- International;

- UK;
- National (England);
- Regional (south east England);
- County (Greater London);
- District/borough (Newham, Greenwich, Tower Hamlets);
- Local (Silvertown area); and
- Site (within the LLAU).

9.3.24 Table 9-2 (taken from DMRB Interim Advice Note 130/10) provides an indication of the types of receptor that would be classified in each category.

Table 9-2 Assessing value of receptors

Category	Receptors
<p>International or European Value</p>	<p>Natura 2000 sites including: Sites of Community Importance (SCIs); Special Protection Areas (SPAs); potential SPAs (pSPAs); Special Areas of Conservation (SACs); candidate or possible SACs (cSACs or pSACs1); and Wetlands of International Importance (Ramsar sites).</p> <p>Biogenetic Reserves, World Heritage Sites and Biosphere Reserves.</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p> <p>Resident, or regularly occurring, populations of species which may be considered at an International or European level where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; or • the population forms a critical part4 of a wider population at this scale; or

	<ul style="list-style-type: none"> the species is at a critical phase⁵ of its life cycle at this scale.
<p>UK or National Value (England)</p>	<p>Designated sites including: Sites of Special Scientific Interest (SSSIs); Marine Protected Areas (MPAs) including Marine Conservation Zones (MCZs); and National Nature Reserves (NNRs).</p> <p>Areas which meet the published selection criteria (e.g. JNCC (1998)) for those sites listed above but which are not themselves designated as such.</p> <p>Areas of key/priority habitats identified in the UK Biodiversity Action Plan (BAP), including those published in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principal importance for the conservation of biodiversity.</p> <p>Areas of Ancient Woodland (e.g. woodland listed within the Ancient Woodland Inventory).</p> <p>Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level where:</p> <ul style="list-style-type: none"> the loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or the population forms a critical part of a wider population at this scale; or the species is at a critical phase of its life cycle at this scale.
<p>Regional Value (south east England)</p>	<p>Areas of key/priority habitats identified in the Regional BAP (where available); areas of key/priority habitat identified as being of Regional value in the appropriate Natural Area Profile (or equivalent); areas that have been identified by regional plans or strategies as areas for restoration or re-creation of priority habitats (for example, South West Nature Map); and areas of</p>

	<p>key/priority habitat listed within the Highways Agency's BAP.</p> <p>Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level and key/priority species listed within the HABAP where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or • the population forms a critical part of a wider population; or • the species is at a critical phase of its life cycle.
<p>County or District/Borough Value (Greater London/ Newham, Greenwich, Tower Hamlets</p>	<p>Designated sites including: Sites of Importance for Nature Conservation (SINCs); County Wildlife Sites (CWSs); and Local Nature Reserves (LNRs) designated in the county or district/borough area context.</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p> <p>Areas of key/priority habitats identified in the Local BAP; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent).</p> <p>Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species across the County or district/borough; or • the population forms a critical part of a wider population; or • the species is at a critical phase of its life cycle.

<p>Local Value (Greenwich Peninsula, Canning Town and Silvertown)</p>	<p>Trees that are protected by Tree Preservation Orders (TPOs).</p> <p>Areas of habitat; or populations/communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees, scrub/grassland mosaic, etc.), including features of value for migration, dispersal or genetic exchange.</p>
<p>Site level (within the LLAU)</p>	<p>Sites that retain habitats and/or species of limited ecological importance due to their size, species composition or other factors.</p>

Amended from: Ratcliffe (1977) A Nature Conservation Review. Cambridge University Press, Cambridge (Ref 9-8).

- 9.3.25 In addition to the above criteria, for breeding birds the BoCC (2009) (Ref 9-9) traffic light system of highlighting species of nature conservation concern is also considered. This system was derived from the review of the population status of 247 bird species that are regularly found breeding within the United Kingdom. The review used data from national monitoring schemes by the leading governmental and non-governmental conservation organisations in the UK. Bird population in the UK is then allocated into the red, amber or green list criteria.
- 9.3.26 In the process of Ecological Impact Assessment (EclA) it is important to select the appropriate features for inclusion in the assessment. In this case, a threshold of site level value has been set as this is an urban location with little semi-natural greenspace. Therefore, even habitats and species valued at the site level are relevant to the Scheme assessment.

Characterising the potential impact

- 9.3.27 Based on an understanding of the baseline conditions and of the Scheme, potential impacts to valuable receptors have been considered, taking into account both the construction and operational phases. Impacts have been assessed against the predicted future baseline and have been characterised with reference to ecological structure and function of the feature in question, for instance the fragility/stability of an ecosystem and its connectivity to other features or resources.
- 9.3.28 The impact section (Section 9.6) will only concern habitats, protected species or species of conservation concern that have the potential to be affected by the Scheme. Those features to be retained, receptors with no risk of impact and receptors that were evaluated as being of no ecological

value will be scoped out of the assessment and will not be discussed further in the document, except with regard to generic mitigation.

9.3.29 The following parameters have been referred to in assessing impacts on ecological structure and function. Should any of these parameters be unknown, this has been clearly stated.

- positive or negative;
- sensitivity
- magnitude;
- extent;
- duration;
- reversibility; and
- timing and frequency.

Assigning significance

9.3.30 For the purposes of this assessment, ecologically significant impact is defined as an adverse or beneficial impact on the integrity of a defined site, ecosystem and/or the conservation status of habitats or species within a given geographical area. It may be that an impact is found not to be significant at the level at which the resource or feature has been valued. It may, however, still be significant at a smaller geographical scale e.g. a receptor valued as being of local value is significantly impacted, but the impact only reduces its value to site level.

9.3.31 An impact that is of significance below site level, or is deemed to be not significant, has been scoped out of the impact assessment chapter, unless there are legal implications associated with the impact (such as impacts on legally protected species), in which case these will be clearly stated.

Confidence in prediction of impact on sensitive receptor

9.3.32 The following four-point scale has been adopted to describe the degree of confidence in the assessment of the impact on ecological structure and function. This confidence level relates to the likelihood, based on expert judgement, that a construction, or operational, event or activity will lead to the described ecological impact on a sensitive receptor.

- certain/near-certain - probability estimated at 95% chance or higher;
- probable - probability estimated above 50% but below 95%;
- unlikely - probability estimated above 5% but below 50%; or
- extremely unlikely - probability estimated at less than 5%.

Significance criteria

- 9.3.33 The significance of an effect will be determined on the basis of an analysis of the factors that characterise the effect, irrespective of the value of the receptor. A significant effect is defined as one which is considered likely to affect the integrity or conservation status of a Key Ecological Receptor (KER). Where a significant effect is identified, the value of the receptor will be used to help determine the geographical scale at which the effect is significant. Thus, any negative effect which is considered to significantly affect the integrity of a receptor of, for example, national value will be identified as being a nationally significant effect.
- 9.3.34 The significance of the likely effects upon the KERs will be assessed both before and after consideration of the additional mitigation measures. The latter will represent the assessment of the residual effects of the Scheme.
- 9.3.35 Table 9-3 below illustrates an approach to relating significant impacts on receptors at different levels of value, taken from Table 9-2 above, to the overall 'significance categories' used by other topic areas. This approach (which is set out in DMRB IAN 130/10 (Ref 9-7)) takes account of other sources of references, but does not specifically align with any single published methodology.

Table 9-3 Nature conservation assessment - significance of effects

Significance category	Typical descriptors of effect (nature conservation)
Very Large	A significant impact on one or more receptor(s) of International, European, UK or National Value. [NOTE: only adverse effects are normally assigned this level of significance. They should be considered to represent key factors in the decision-making process.]
Large	A significant impact on one or more receptor(s) of Regional Value.

	[NOTE: these effects are considered to be very important considerations and are likely to be material in the decision-making process.]
Moderate	A significant impact on one or more receptor(s) of County or Unitary Authority Area Value. [NOTE: these effects may be important, but are not likely to be key decision-making factors.]
Slight	A significant impact on one or more receptor(s) of Local or Site Value. [NOTE: these effects are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.]
Neutral	No significant impacts on key nature conservation receptors. [NOTE: absence of effects, or those that are beneath levels of perception.]

Limitations and assumptions

- 9.3.36 The extended Phase 1 habitat survey was undertaken on 6th November and 17th March. The optimal season for habitat survey according to the JNCC Handbook for Phase 1 Survey (Ref 9-10) starts in late March/early April until October. The two survey visits were undertaken within a week of the optimal period during suitable weather conditions given the nature of the habitats on site this is not considered to be a significant limitation to the survey as the habitats and potential ecological constraints could be appropriately assessed.
- 9.3.37 Some areas of the Site have not been surveyed (see Volume 3 of the PEIR, Drawing 9.3) due to changes in the LLAU since the original surveys were undertaken. Only relatively small areas of the Site have not been subject to Phase 1 survey and the surveys to date are considered to be robust enough to evaluate likely ecological impact at this stage. Boundary changes will be addressed by further survey in 2015, and will be incorporated into the ES prior to submission of the DCO application.
- 9.3.38 Additional bat activity surveys have been undertaken during the core 2015 bat survey season (April to September inclusive) and an arboricultural survey will be undertaken in autumn 2015; the results of which will be incorporated into the ES prior to submission of the DCO application.

9.4 Existing baseline conditions

Zone of influence

9.4.1 As described in Section 9.3, the maximum extent of the potential 'zone of influence' for terrestrial ecology (i.e. the Study Area) extends to 2km from the LLAU (extended to 5km for Natura 2000 sites, with the exception of and 30km for SACs designated for bats) for the desk study element. However the actual zone of influence has been determined on a receptor by receptor basis (by professional judgement) due to the nature of the proposals, whereby impacts and receptors will be largely within the Site boundaries.

Designated sites

9.4.2 No Natura 2000 sites were recorded within 5km of the Scheme during the desk study and are screened out of the assessment. All other potentially significant effects on Natura 2000 sites within 30km were screened out. Further detail regarding scoping and screening of sites is presented in Volume 3 of the PEIR, Appendix 9.C: Habitats Regulations Assessment (HRA).

9.4.3 The Site is not situated within or immediately adjacent to any nationally designated sites for nature conservation. Although the Scheme lies within 2km of one Geological SSSI, one Local Nature Reserve (LNR) and 27 non-statutory SINC, none of these sites will be directly affected by construction or operation of the Scheme. These sites have been mapped on Drawings 9.1 and 9.2. The closest of these sites to the Scheme are as follows:

- The River Thames and Tidal Tributaries SINC (this includes the areas of mudflat within the study area, under which the tunnel would be bored) is directly adjacent to the Scheme at Silvertown. The potential effects on the SINC will be discussed within the Marine Chapter.
- Royal Docks SINC (an area of open water linked to the River Thames and its tidal creeks, located approximately 0.2km east of the northern part of the Site).
- Greenwich Ecology Park and Southern Park SINC (an area of freshwater habitat with native tree planting and wildflower meadows approximately 0.5km south-east of the Greenwich site).

- East India Dock Basin SINC (an area of mud and saltmarsh habitat approximately 0.5km west of the Silvertown site).
- Bow Creek Ecology Park SINC (an area of created wetlands which include ponds, reedbeds and ditches approximately 0.8km north-west of the Silvertown site).

9.4.4 Further information and assessment on River Thames and Tidal Tributaries and the East India and Royal Docks SINC is presented within Chapter 10: Marine Ecology and are not discussed further within this Chapter.

Habitats

Overview

9.4.5 The Site is located within a highly developed area. It is necessarily divided into two parcels either side of the River Thames. The northern parcel is in Silvertown and the southern parcel in Greenwich; the parcels are herewith referred to as northern and southern or north and south.

9.4.6 Overall, the Phase 1 Habitat Survey confirmed that the Site comprises habitat typical of the built environment, mostly buildings and hard standing, with some areas of relatively poor quality vegetation. The habitats on Site are described below and their locations are shown on the Phase 1 Habitat Survey Plan (see Drawing 9.3). The habitats on Site are fully described with descriptions of target notes in Volume 3 of the PEIR, Appendix 9.A.

9.4.7 The Scheme is directly adjacent to the River Thames to the north. The boundary of the Scheme with the River Thames at Silvertown is represented by hard infrastructure such as sheet piling, wharfs and walls. There is no saltmarsh vegetation in the study area; however, there is a small amount of exposed mud at low tide. Rivers are listed as London, Greenwich and Newham BAP Priority Habitats. Riparian habitats are dealt with in Chapter 10: Marine Ecology.

9.4.8 The over-ground proposed construction works to the south in the Greenwich area are set back from the River Thames by approximately 200m.

9.4.9 The area of each terrestrial habitat recorded within the LLAU of Silvertown and Greenwich during the extended Phase 1 habitat survey is provided in Table 9-4 and Table 9-5 respectively below.

Table 9-4 Total area of habitats within LLAU – Silvertown

Existing habitat	Area m²
Mixed plantation woodland	3,040
Broad-leaved scattered trees	18
Dense/continuous scrub	7,890
Scattered scrub	100
Species-poor semi-improved grassland	6,090
Standing water	2,330
Scattered bracken	8
Tall ruderal vegetation	880
Amenity grassland	1400
Ephemeral/short perennial vegetation	0
Scattered introduced shrub	30
Buildings	6350
Hard standing and other habitats with negligible biodiversity potential	83,000
Not Surveyed for this submission	42,990
Total	154,126

Table 9-5 Total area of habitats within LLAU – Greenwich

Existing habitat	Area m²
Mixed plantation woodland	1640
Broad-leaved scattered trees	50
Dense/continuous scrub	10,140
Scattered scrub	40
Species-poor semi-improved grassland	5580
Standing water	0

Existing habitat	Area m ²
Scattered introduced shrub	90
Tall ruderal vegetation	280
Amenity grassland	4250
Ephemeral/short perennial vegetation	0
Buildings	1210
Hard standing and other habitats with negligible biodiversity potential	99,860
Not surveyed for this submission	0
Total	123,140

Buildings and hard standing

9.4.10 South: The area required for the construction of the southern (Greenwich) end of the Scheme is largely comprised of paved areas including the Blackwall Tunnel Approach to the west, Millennium Way and The O2 car parking to the east, and an industrial site to the north. A number of buildings, predominantly small industrial structures, are present on Site and a gasholder structure is located immediately outside the LLAU to the east (see Drawing 9.3). Some areas of hard standing have become colonised by ephemeral/short perennial vegetation.

9.4.11 North: The northern part of the Scheme area (Silvertown) is dominated by industrial infrastructure of limited nature conservation importance. Buildings occur across the whole area, one of which is a brick-construction structure with crevices in brickwork and in a fascia board. As in the south section, ephemeral/short perennial vegetation has colonised the hard standing in some areas.

Woodland and scrub

9.4.12 South: The southern area includes mature and young scattered broadleaved trees throughout. There is also a pocket of derelict land that supports successional communities, a mixture of small trees and scattered scrub (see Target Note G1 on Figure 9.3 located in Volume 3 of the PEIR, Appendix 9.A). This is one of the only patches of such habitat on the Greenwich Peninsula. A parcel of mature plantation woodland (see Target Note G2 on Drawing 9.3) contains species such as Sycamore (*Acer pseudoplatanus*) and Silver Birch (*Betula pendula*) as well as the

Schedule 9 non-native invasive Virginia Creeper (*Parthenocissus quinquefolia*) (see Target Note G3 on Drawing 9.3). A large patch of dense/continuous scrub south of the planted woodland (see Target Note G6 on Drawing 9.3) is dominated by Bramble (*Rubus fruticosus* agg.), Butterfly-bush (*Buddleja davidii*) and some Grey Willow (*Salix cinerea*) to the south. Scattered bracken was recorded in the north of this part of the Site.

- 9.4.13 North: Areas of dense/continuous scrub occur throughout the Site, occasionally occurring along the Site boundary. One dense/continuous scrub parcel, located adjacent to the DLR track towards the south-west of the Silvertown site, surrounds an outlet pipe (see Target Note S6 on Drawing 9.3). It is comprised of very dense Butterfly-bush, Elder (*Sambucus nigra*), and Bramble. Two areas of mixed plantation occur in the north of the Site, one planted onto the Tidal Basin Road Roundabout. Scattered bracken was recorded in the north and west of this part of the Site.

Grassland

- 9.4.14 South: There is a stretch of unmanaged poor semi-improved grassland in the north of the Greenwich site (see Target Note G1 on Drawing 9.3). Species include False Oat-grass (*Arrhenatherum elatius*), Canadian Fleabane (*Conyza canadensis*), Prickly Ox-tongue (*Picris echioides*) and Yarrow (*Achillea millefolium*). There are patches of amenity grassland and tall ruderal vegetation throughout this part of the Site.
- 9.4.15 North: Areas of poor semi-improved grassland are located across the Silvertown site. One area in the north of the Silvertown site is bordered to the east and west by dense scrub and is interspersed with patches of bare ground and ephemeral/short perennial vegetation (see Target Note S2 on Figure 9.3). Species include False Oat-grass, Mugwort (*Artemisia vulgaris*) and Broad-leaved Dock (*Rumex obtusifolius*). Another area of poor semi-improved grassland borders a settling pond (described below) and extends south forming the DLR track embankment (see Target Notes S5, S7 and S8 on Drawing 9.3). There are patches of amenity grassland and tall ruderal vegetation throughout this part of the Site.

Wetland habitats

- 9.4.16 North: A settling pond for silt and a channel connecting the pond to the River Thames are located within the industrial area. This supports a dense growth of Common Reed (*Phragmites australis*) and some Willow

(*Salix* sp.) scrub. The pond is an isolated feature and choked with deep silt. Standing water is listed as a London, Greenwich and Newham BAP Priority Habitat although this pond may not be of a quality to qualify as a BAP habitat.

Species

- 9.4.17 The desk study and extended Phase 1 Habitat Survey confirmed the potential for the habitats on Site to support notable plants, invertebrates, birds (including nesting and foraging black redstarts), roosting and foraging bats, and common species of reptiles. Very little exposed mud was present adjacent to the Scheme area at low tide. Wading birds were not therefore considered likely to be present in significant numbers in this location and are therefore not considered to be a significant ecological receptor.

Plants

- 9.4.18 GiGL held a large number of records for notable plant species (including nationally scarce species and local species of conservation concern) within 2km of the most up-to-date LLAU at the time. The closest of these included Creeping Willow (*Salix repens*), Sea-Buckthorn (*Hippophae rhamnoides*), Golden Dock (*Rumex maritimus*), Meadow Crane's-bill (*Geranium pratense*) and Common Cudweed (*Filago vulgaris*), all of which are listed as local species of conservation concern. Common Cudweed could occur within the habitats recorded at Silvertown as it is associated with ephemeral plant communities and these are present within the Site.
- 9.4.19 GiGL held a number of records for invasive plant species located within 2km of the Site, these included Montbretia (*Crocasmia x crocosmiiflora*), Giant Hogweed (*Heracleum mantegazzianum*), Himalayan Balsam (*Impatiens glandulifera*), Japanese Knotweed, Floating Pennywort (*Hydrocotyle ranunculoides*), Three-cornered Garlic (*Allium triquetrum*), Rhododendron (*Rhododendron ponticum*) and Wall Contoneaster (*Cotoneaster horizontalis*).
- 9.4.20 No notable plant species were recorded during the extended Phase 1 habitat survey, but it was confirmed that the Site contained areas of Japanese Knotweed (see Target notes G4 and S1 on Drawing 9.3) and Virginia Creeper (see Target Note G3 on Drawing 9.3).

Invertebrates

- 9.4.21 GiGL held a number of notable invertebrate records within 2km of the Site including, wall (*Lasiommata megera*), stag beetle (*Lucanus cervus*) and ear moth (*Amphipoea oculatea*). Stag beetles are protected under the Wildlife and Countryside Act 1981 (as amended) and listed as a London, Greenwich and Newham BAP Priority Species. However, none of these records were located within 0.5km of the Site.
- 9.4.22 The extended Phase 1 Habitat Survey confirmed that there were areas of suitable habitat for notable invertebrates such as areas of poor semi-improved grassland in Silvertown (see Target Notes S3 and S5 on Drawing 9.3).
- 9.4.23 An invertebrate survey of the Site undertaken in June-August 2014 recorded 311 species, including two Red Data Book species (a list of species that are at risk of extinction based on Shreeve, 1997 and IUCN criteria) (toadflax brocade moth (*Calophasia lunula*) and the ground bug (*Stictopleurus punctatonevrosus*), though both of these have become widespread and common in the Thames corridor since the designation was applied. In addition, seventeen Nationally Scarce species were recorded including the long-winged cone-head (*Conocephalus discolor*) and a myrmecophilous ladybird, (*Platynaspis luteorubra*). Further detail can be found in Appendix 9.B.

Amphibians and reptiles

- 9.4.24 GiGL held one common toad (*Bufo bufo*) record located 1.6km from the Site and one slow-worm (*Anguis fragilis*) record located 1.8km from the Site. Amphibians are listed as a Newham BAP Priority Species and reptiles are listed as London and Newham BAP Priority Species.
- 9.4.25 The extended Phase 1 Habitat Surveys confirmed that the Site supports habitat suitable for use by the widespread species of reptiles, such as areas of semi-improved grassland interspersed with dense/continuous scrub (see Target Notes G1, G5, S2, S3, S5 and S7 on Drawing 9.3), but was not considered suitable for use by amphibians.
- 9.4.26 No reptiles were recorded during the targeted reptile surveys.

Breeding birds

- 9.4.27 GiGL held a number of records for red-listed bird species, typical of urban and wetland habitats, located within 2km of the Site, including lapwing (*Vanellus vanellus*), dunlin (*Calidris alpina*), yellow-legged gull (*Larus michahellis*), starling (*Sturnus vulgaris*) and lesser spotted woodpecker (*Dendrocopos minor*).
- 9.4.28 GiGL held a large number of confidential black redstart (*Phoenicurus ochruros*) records located within 2km of the Site. Black redstarts are listed as a London and Greenwich BAP Priority Species. Both the River Thames and tidal tributaries and East India Dock Basin SINC are known to support foraging black redstarts.
- 9.4.29 The extended Phase 1 Habitat survey confirmed that the Site (Greenwich and Silvertown) supports habitat suitable for use by nesting birds including dense/continuous scrub, mixed plantation, scattered broadleaved trees, buildings (comprised of a range of building materials) and an area of fraying concrete with ephemeral herbs and scrub, which was considered suitable for breeding and foraging black redstart (see Target Note S11 on Drawing 9.3).
- 9.4.30 The small amount of intertidal mud recorded along the River Thames at Silvertown is considered suitable for wading birds.
- 9.4.31 Habitat beyond Dock Road in Silvertown and around the gas holders at Greenwich is considered suitable for foraging and nesting black redstart. However, no black redstarts were seen/heard during the course of the targeted black redstart surveys (Silvertown and Greenwich).

Bats

- 9.4.32 GiGL held a number of bat species records within 2km of the Site including, Daubenton's bat (*Myotis daubentonii*), noctule bat (*Nyctalus noctula*) and soprano pipistrelle (*Pipistrellus pygmaeus*). However, none of these records was located within 0.5km of the Site. Bats are listed as London, Greenwich and Newham BAP Priority Species.
- 9.4.33 The Site (Silvertown and Greenwich) supports habitats suitable for use by commuting and foraging bats and in the case of Silvertown, habitat suitable for use by roosting bats, though no bats were recording during the dusk emergence survey. Additional surveys (bat activity) in accordance with BCT guidelines are being undertaken in order to evaluate

how bats are currently using the Site. The results will be incorporated into the EIA.

Value of receptors

9.4.34 Table 9-6 shows the level of importance attributed to the ecological receptors of the Scheme, with justifications.

Table 9-6 Value of Receptors

Receptor	Value / importance	Evaluation statement
Habitats		
Bow Creek Peninsula Ecology Park SINC	Borough	An area of meadow, pond and stream habitat approximately 0.8km north west of the northern part of the application site in Newham
Greenwich Peninsula Ecology Park SINC	Borough	An area of open water linked to the River Thames and its tidal creeks, located approximately 0.2km east of the northern part of the application site in Greenwich
Mixed plantation woodland	Local	Mixed plantation woodland in the south area of the Site (see Target Note G2 on Drawing 9.3) provides multiple ecosystem service benefits and good examples in the local area are scarce
Dense/continuous scrub	Local	Dense scrub provides multiple ecosystem service benefits and good examples in the local area are scarce
Scattered scrub	Site	Scattered species-poor scrub has some ecological value but other examples in the local area are common
Immature planted and scattered broad-leaved trees	Site	Immature planted and scattered broad-leaved trees have some ecological value but other examples in the local area are common

Receptor	Value / importance	Evaluation statement
Mature broad-leaved planted trees	Local	Mature broad-leaved trees are scarce in this urban environment and difficult to replace
Species-poor semi-improved grassland	Local	Semi-improved grassland is uncommon and has biodiversity value in a highly developed area
Scattered bracken	Site	Limited ecological value
Tall ruderal	Site	Has biodiversity value but other examples occur in the local area
Standing water/sludge lagoon	Local	Standing water is listed as a London BAP; however, this lagoon has become degraded with silt washed in from the adjacent industrial sites. The lagoon did have some notable features including a stand of Common Reed also a London BAP feature and provides a range of ecosystem services uncommon in the area.
Amenity grassland	Site	Other examples of this habitat, which is readily replaceable, occur in the local area
Ephemeral/short perennial	Site	Has biodiversity value but other examples occur in the local area; is a transient habitat that is readily replaceable
Scattered introduced shrub	Site	Has biodiversity value but non-native and readily replaceable
Buildings	Negligible	Buildings are of negligible value although their value with regards to nesting birds and roosting bats will be assessed in the relevant sections
Species		
Breeding birds	Local	Other nesting opportunities for common breeding birds occur in the local area. However, there is potential for Priority Species such as herring gull (<i>Larus argentus</i>)

Receptor	Value / importance	Evaluation statement
		<i>argentus</i>), house sparrow (<i>Passer domesticus</i>), hedge accentor (<i>Prunella modularis</i>) and common starling (<i>Sturnus vulgaris</i>) to be breeding on Site.
Black redstart	County	Black redstart is a Schedule 1 (WCA, 1981, as amended) species and is listed on the London BAP. No black redstart were recorded during the targeted survey; however, the Site is within a key area for this species and the habitat on Site has high potential to support it, particularly while under construction and particularly for foraging as recently turned bare earth in proximity to water are their preferred foraging habitat.
Terrestrial invertebrates	Local	Nineteen noteworthy invertebrate species were recorded on the Site, 5.7% of the total number recorded. However, many sites in the Borough have a greater proportion of notable invertebrate species.

Future ‘do nothing’ baseline

- 9.4.35 In the absence of the Scheme a minor change in the ecological structure of the Site would be predicted as a result of natural succession, resulting in a progressive trend towards scrub and woodland habitats.
- 9.4.36 There are two developments (land to the south of Phoenix Avenue and to the West of Olympian Way (known as Plots NO207, NO404, NO405, MO106-MO110 & MO118 of the Greenwich Peninsula Masterplan) and 26 To 34 Tidal Basin Road) included in the base case (future baseline) adjacent to the Site. In the absence of the Scheme, these developments could impact on the ecological integrity of the Site through disturbance of breeding birds.
- 9.4.37 In addition, long-term climatic predictions suggest that warmer, wetter winters and drier summers will become more frequent in England, with

more extreme weather events (Ref 9-11). This is likely to have an effect on the ecological composition of the Site, most significantly invertebrates, which are often highly mobile and sensitive to climate. Plant communities are also likely to be influenced by climate change, potentially including an increase in non-native species adapted to higher temperatures colonising the Site.

9.5 Scheme design and mitigation (in-built Scheme mitigation)

9.5.1 All impacts are assessed with the assumption that the mitigation which is embedded in the scheme design (i.e. Volume 1, Chapter 4 – Scheme Description and the Preliminary Engineering Report) is included and will be implemented. This includes construction and operation mitigation. Temporary habitat loss and the potential for direct mortality or disturbance due to construction is considered under the construction headings, whereas the effect of permanent habitat loss is considered under operation headings.

Confirmed construction mitigation

9.5.2 Generic construction mitigation for all receptors (with the exception of replacement of temporarily lost ecologically valuable habitats) (see Volume 5, Drawing 9.4 and Table 9-9), will be presented in detail within the Preliminary Code of Construction Practice (CoCP), a draft of which is included in Volume 3, Appendix 4.A. In addition to good practice construction approaches, there is a requirement for bespoke mitigation, which is presented below.

All receptors

9.5.3 As set out in the Preliminary CoCP, a Construction Environmental Management Plan (CEMP) will be prepared prior to construction, which will detail how ecological receptors are to be protected during construction.

Direct mortality during construction

9.5.4 To prevent direct mortality of breeding birds and minimise effects on notable terrestrial invertebrates during construction any clearance of vegetation suitable for breeding birds and invertebrates (namely scrub and trees) would be undertaken outside of the breeding bird season (end of February to mid-August) or following a check for active bird nests by a

suitably qualified ecologist in order to mitigate any potential impact on breeding birds.

9.5.5 There is potential for direct mortality of black redstart which may be nesting on site during construction. Disturbance to Breeding Birds during Construction

9.5.6 Site hoardings will be erected surrounding the works which will reduce adjacent disturbance although birds will be temporarily displaced from the area.

9.5.7 There is potential for disturbance of black redstart which may be nesting on site during construction.

Degradation of adjacent habitats during construction

9.5.8 There is potential for degradation to habitat adjacent to the development due to ground-breaking works, vehicle movement and dust.

9.5.9 Habitats of value with potential to be affected beyond the LLAU will be demarcated and avoided. For example, where there are sensitive habitats such as trees adjacent to the Site, an appropriate barrier e.g. Herras fencing would be put in place to ensure that the trees and their roots would be protected throughout the construction phase.

9.5.10 Tree Survey to 'British Standard 5837: 2012 Trees in relation to design, demolition and construction – Recommendations' (Ref 9-12) will be undertaken in autumn 2015 to determine the Root Protection Areas (RPAs) of individual trees and demarcate the working corridor allowing it to be fenced where necessary to prevent damage.

9.5.11 In order to to mitigate impacts on sensitive ecological receptors such as breeding birds and notable invertebrates the Preliminary CoCP, Volume 3, Appendix 4.A includes dust attenuation measures to prevent pollution, (as described in Chapter 6: Air Quality), timing recommendations to avoid core activity periods and pollution prevention measures following Environment Agency guidelines, (as described in Chapter 16: Water Environment).

Confirmed operational mitigation

9.5.12 Areas available for mitigation to replace the permanent loss of ecologically valuable habitats have been incorporated into the design, as shown on Drawing 9.5 in Volume 2 of the PEIR. The habitats to be created and their

areas are provided in Table 9-7 and 9-8 below. Design principles have been provided for these habitats (presented in the Preliminary Design and Access Statement) and will be further developed for the ES submission and potentially implemented via a project specific BAP.

Table 9-7 Areas of permanent replacement habitat – Silvertown

Proposed habitat	Area (m²)
Shrubs / trees / understorey planting	1,190
Total	1,190

Table 9-8 Areas of permanent replacement habitats – Greenwich Peninsula

Proposed habitat	Area (m²)
Grass area	9,750
Meadow area	1,170
Tree zone	60
Total	10,980

9.5.13 As Table 9-7 and Table 9-8 show, there is currently a total of **12,170m²** of permanent habitat creation across the two sites incorporated into the Scheme design.

9.6 Assessment of impacts (after in-built Scheme mitigation)

Receptors scoped out of the assessment

Terrestrial designated sites including SINCs

9.6.1 Designated sites are scoped out of the assessment due to their distance. The most closely associated SINC

s (Bow Creek Peninsula Ecology Park and Greenwich Peninsula Ecology Park) will not be directly affected by the development, nor are they hydrologically linked. They are not discussed further within the assessment.

Wading and wintering birds

9.6.2 The Scheme at Silvertown is directly adjacent to the river Thames. There is no saltmarsh vegetation in the study area; however there is a small

amount of exposed mud at low tide suitable for wading birds. The available habitat for wintering and wading birds is negligible to that along the less urbanised areas of the River Thames. None of this habitat will be lost to the development. It is considered unlikely that the Scheme would cause any significant disturbance to wading birds as the area of mud appears to be very limited and the current baseline situation includes a lot of industrial activity, boat and vehicle movements adjacent to the river in this location. Therefore wintering and wading birds have been scoped out of this assessment.

Amphibians

9.6.3 The extended Phase 1 Habitat Survey determined that the habitat on Site was not suitable for amphibians.

Reptiles

9.6.4 The extended Phase 1 habitat survey identified areas of habitat suitable for reptiles. However, no reptiles were recorded during the targeted reptile survey. The Site has been evaluated as having limited habitat connectivity to the wider area for reptiles.

Construction impacts

9.6.5 These construction impacts are temporary impacts with the potential to result in significant effects, including temporary loss of habitats solely for construction purposes, as shown in Table 9-9 and Table 9-10 below. Impacts such as permanent habitat loss that would potentially be permanent effects are discussed in Operational Impacts.

Table 9-9 Areas of temporary semi-natural habitat loss - Silvertown

Existing habitat	Area to be lost (m²)
Mixed plantation woodland	550
Broad-leaved scattered trees	0
Dense/continuous scrub	5,790
Scattered scrub	60
Species-poor semi-improved grassland	2,940
Standing water	160
Scattered bracken	0

Existing habitat	Area to be lost (m ²)
Tall ruderal vegetation	720
Amenity grassland	50
Ephemeral/short perennial vegetation	0
Scattered introduced shrub	4
Total	10,274

Table 9-10 Areas of temporary semi-natural habitat loss - Greenwich

Existing habitat	Area to be lost (m ²)
Mixed plantation woodland	1,590
Broad-leaved scattered trees	14
Dense/continuous scrub	0
Scattered scrub	35
Species-poor semi-improved grassland	930
Standing water	0
Tall ruderal vegetation	25
Amenity grassland	0
Ephemeral/short perennial vegetation	1,370
Scattered introduced shrub	0
Total	3,964

9.6.6 Prior to additional mitigation there are potential adverse effects due to temporary habitat loss (i.e. net loss of habitat of biodiversity value). In addition to the effects of temporary habitat loss, due to the additional protection afforded to black redstart as a Schedule 1 species of the WCA (1981, as amended) (protected from disturbance while nesting) and due to their differing nesting and foraging habitat (nesting on structures on construction sites and foraging over recently turned earth) there is potential for direct mortality and disturbance while nesting to this species.

9.6.7 The potential construction effects of the Scheme set out below have been assessed based on the construction mitigation set out above and in the Preliminary CoCP.

Table 9-11 Potential construction impacts

Duration	Receptor(s) affected/Value	Impact description	Significance of impact	Confidence
Short to mid term	Mixed plantation/Site	Direct habitat loss	Slight Adverse	Certain
	Dense/continuous scrub/Local	Direct habitat loss	Slight Adverse	Certain
	Scattered scrub/Site	Direct habitat loss	Slight Adverse	Certain
	Broad-leaved scattered trees/Site	Direct habitat loss	Slight Adverse	Certain
	Mature broad-leaved planted trees/Local	Direct habitat loss	Slight Adverse	Certain
	Species-poor semi-improved grassland/Local	Direct habitat loss	Slight Adverse	Certain
	Tall ruderal/Site	Direct habitat loss	Slight Adverse	Certain
	Standing water (sludge lagoon)/Local	Direct habitat loss	Slight Adverse	Certain
	Scattered introduced shrub/Site	Direct habitat loss	Slight Adverse	Certain
	Buildings/Site	Direct habitat loss	Slight Adverse	Certain
	Non-native invasive species	Direct habitat loss	Slight Beneficial	Certain
Short term	Black redstart	Direct habitat loss, direct mortality and disturbance	Slight Adverse	Probable to unlikely

Proposed additional construction mitigation

9.6.8 Should development commence later than two years after the current 2015 updated surveys then a pre-construction survey should be undertaken to update the potential ecological constraints. This should include an extended Phase 1 habitat survey followed by targeted surveys

for protected species that may be using the Site. This will prevent impacts on mobile species in the unlikely event that new species move into the area.

- 9.6.9 Within the areas of temporary land take for construction (totalling 119,000m² over both sites), as shown on Volume 3 of the PEIR, Drawing 9.4, there is scope to provide mitigation for the adverse effects of temporary habitat loss, as shown in Table 9-11 and quantified in Tables 9-9 and Table 9-10, this would deliver as a minimum like for like replacement in terms of area and quality.
- 9.6.10 It is not clear in the long term what the development proposals are for the areas cleared solely for construction purposes. However, it is likely that the areas of temporary land take would be returned to their previous condition post-construction. There is potential for this mitigation to be secured via the mechanism of a Scheme specific BAP which can be conditioned in principle.
- 9.6.11 Therefore there will be no adverse residual effects due to temporary habitat loss.
- 9.6.12 Black redstart monitoring will be undertaken annually during the construction period from April to July. If black redstart is recorded, liaison will be undertaken between the ecologist and the contractors to determine whether there is a need for additional mitigation, demarcation of exclusion zones or whether works are required to stop temporarily until the birds have left the area (i.e. following the breeding period). Requirements would depend on the scale of the potential impact but options include initial weekly monitoring during the breeding season and during construction with bespoke recommendations from the ecologist such as temporary protection of the area from construction and the provision of additional areas of black redstart foraging habitat and/or additional black redstart nesting boxes/ledges and or singing posts.
- 9.6.13 Therefore no adverse residual effects are predicted due to direct mortality or disturbance of black redstart.

Operational impacts

- 9.6.14 Table 9-12 and Table 9-13 below set out the overall potential permanent habitat loss (m²) following the in-built mitigation.

Table 9-12 Permanent habitat loss following confirmed mitigation - Silvertown

Total existing semi-natural habitat (m ²)	Permanent removal	Permanent replacement	Potential habitat loss
21,630	11,240	1,190	10,050

Table 9-13 Permanent habitat loss following confirmed mitigation - Greenwich

Total existing semi-natural habitat (m ²)	Permanent removal	Permanent replacement	Potential habitat loss
22,070	17,160	10,980	6,180

9.6.15 Following mitigation currently confirmed there will be a net permanent deficit of **16,230m²** of semi-natural habitat across both sites. Proposals for how this deficit can be mitigated are made below.

9.6.16 Table 9-14 below sets out the detailed ecological impacts likely to be caused during the operational phase of the Scheme and their relative significance; this is an overall assessment of the residual operational effects of the current Scheme.

Table 9-14 Operational impacts

Duration	Receptor(s) affected/value	Impact description	Significance of impact	Confidence
Long Term	Mixed plantation/Site	Direct habitat loss	Slight Adverse	Certain
	Dense/continuous scrub/Local	Direct habitat loss	Slight Adverse	Certain
	Scattered scrub/Site	Direct habitat loss	Slight Adverse	Certain
	Broad-leaved scattered trees/Site	Direct habitat loss	Slight Adverse	Certain
	Mature broad-leaved planted trees/Local	Direct habitat loss	Slight Adverse	Certain
	Species-poor semi-improved grassland/Local	Direct habitat loss	Slight Adverse	Certain

Duration	Receptor(s) affected/value	Impact description	Significance of impact	Confidence
	Tall ruderal/Site	Direct habitat loss	Slight Adverse	Certain
	Standing water (sludge lagoon)/Local	Direct habitat loss	Slight Adverse	Certain
	Amenity grassland/Site	Direct habitat loss	Slight Adverse	Certain
	Ephemeral/short perennial/Site	Direct habitat loss	Slight Adverse	Certain
	Scattered introduced shrub/Site	Direct habitat loss	Slight Adverse	Certain
	Buildings/Site	Direct habitat loss	Slight Adverse	Certain
	Breeding birds/Local	Direct habitat loss	Slight Adverse	Certain
	Terrestrial invertebrates/Local	Direct habitat loss	Slight Adverse	Certain
	Black redstart/County	Direct habitat loss	Slight Adverse	Probable – no black redstarts were recorded during the targeted survey; however, the Site offers suitable habitat in a key area for this species which are notoriously difficult to find.
Mid term	Japanese Knotweed and other non-native	Direct habitat loss	Slight Beneficial	Probable – Japanese Knotweed

Duration	Receptor(s) affected/value	Impact description	Significance of impact	Confidence
	invasive species	(removal)		and other non-native invasive species will be treated and removed during construction providing an operational benefit for the Site (although these species may return).

Proposed additional operational mitigation

- 9.6.17 For mitigating the slight adverse effects of permanent habitat loss as shown in Table 9-12 and Table 9-13 there are two secured areas of land totalling **7,920m²** and **3000m²** of buildings (that could potentially have brown roofs) that will primarily be used for these purposes (see Volume 3, Drawing 9.5). These would be replaced with trees, shrubs, brownfield habitat, species rich grasslands and at least two waterbodies. The mitigation would also include suitable foraging and sheltering habitat for terrestrial invertebrates and foraging and nesting habitat for black redstart. Parameters for delivering operational mitigation for breeding birds and invertebrates will also be developed and clearly presented within the ES.
- 9.6.18 There are design principles for these habitats presented in the DAS; the design of these habitats and their interface with the Scheme will be developed further for the EIA submission.
- 9.6.19 This will leave a shortfall of habitat to be replaced of at least **6000m²**. Any shortfall in required habitats after this mitigation will be addressed via compensation if mitigation is not possible within the Order limits. This would include, as a minimum, like for like replacement in terms of area and quality but potentially more. Currently work is underway to address this shortfall through additional mitigation and compensation measures. The Scheme would seek to maximise the functionality of these habitats and their location and design to be aligned with general greenspace objectives in the wider area. This provides an excellent opportunity to

engage the local community with the Scheme and to achieve some real benefits for biodiversity. There is also an opportunity to provide additional high-quality habitat using the excavated material produced as part of the Scheme, options for which are being explored.

- 9.6.20 The quantum of habitat required and the design principles for these measures, as before, will be carried through the planning process for the overall area to be delivered by the appropriate planning authority. There is potential for this mechanism to include a Scheme specific BAP which can be conditioned in principle.
- 9.6.21 Therefore there will be no adverse residual effects due to permanent habitat loss for any receptor. At present there is uncertainty around the delivery of this mitigation but the design and mechanism for delivery will be clearly presented in the ES submission.
- 9.6.22 There will be a probable long term slight operational benefit due to the removal of non-native invasivespecies. There is also potential for beneficial effects from maximising the functionality and community engagement for the replacement habitat.

9.7 Cumulative impacts

- 9.7.1 Ten proposed developments located within or adjacent to the Site have been considered with regards to cumulative assessment. Table 9-15 below summarises these.
- 9.7.2 Any developments not adjacent to the site, including the Thames Tideway Tunnel, which runs under the Thames, but not in the vicinity of the Scheme, have been scoped out, as impacts on terrestrial ecological receptors are unlikely.

Table 9-15 Cumulative impacts

Planning application reference	Development summary	Potential cumulative effects
Newham Strategic Site S8	Proposed release from Strategic Industrial Location (see Policy J2). There is scope to reconfigure the safeguarded wharf on the site to the adjacent site (Carlsberg-Tetley) or to remove the wharf safeguarding at Thames Wharf if a consolidated	Mixed use development The proposed development could cause minor additional disturbance to breeding birds through visual and noise disturbance.

Planning application reference	Development summary	Potential cumulative effects
	<p>wharf can be delivered at Thameside West, subject to there being no net loss of functionality or wharf capacity. If it can be demonstrated that either scheme can be delivered, this could provide the opportunity to develop new employment, leisure/tourism and residential uses grouped around a potential new DLR station, where passive provision is in place, subject to addressing the constraints on the site, including the Silvertown Crossing safeguarding area, and the removal of the wharf safeguarding by the Secretary of State. Indicative residential typology - medium density, medium family.</p>	
Greenwich (N/A)	Parking	<p>Mixed use development The proposed development could cause minor additional disturbance to breeding birds through visual and noise disturbance.</p>
Greenwich (N/A)	Film studio	<p>Mixed use development The proposed development could cause minor additional disturbance to breeding birds through visual and noise disturbance.</p>
Greenwich (N/A)	Transport interchange (planned)	<p>Mixed use development The proposed development could cause minor additional disturbance to breeding birds through visual and noise disturbance.</p>
Greenwich (N/A)	Dwelling houses/ serviced apartments (planned) x3	<p>Mixed use development The proposed development could cause minor additional disturbance to breeding</p>

Planning application reference	Development summary	Potential cumulative effects
		birds through visual and noise disturbance.
Greenwich (N/A)	Design districting comprising A, B, C and D classes	Mixed use development
Greenwich (N/A)	Shops/food//financial services	Mixed use development The proposed development could cause minor additional disturbance to breeding birds through visual and noise disturbance.

9.7.3 Overall, the cumulative effects of all proposed developments would be a possible slight adverse additional disturbance to breeding birds through visual and noise disturbance. However, the area is already highly developed and therefore any change in impact is likely to be minimal. Therefore the potential cumulative impacts on breeding birds are unlikely to be significant.

9.8 Further work to be done

9.8.1 Further development of the design and delivery of the required mitigation will be undertaken for both construction and operation, as discussed in Section 9.6.

9.8.2 The results of the following additional surveys are to be incorporated into the EIA submission:

- the results of the updated extended Phase 1 habitat survey will be incorporated into the assessment due to new areas added to the Scheme;
- the results of the arboricultural survey will be incorporated into the assessment to confirm the required mitigation for trees; and
- the results of bat activity transects to confirm the assessment for bats.

9.9 NN NPS compliance

9.9.1 There would be no anticipated effects on designated sites which have been assessed with the PEIR. Figure 9.1 shows statutory designated sites within 2km and Figure 9.2 shows non-statutory designated sites

within 2km of the Site. The results for potential impacts on international sites within 5km (30km for sites designated for bats) of the Site have been confirmed via the HRA (Volume 3 of the PEIR, Appendix 9.C).

- 9.9.2 The National Policy Statement for National Networks (NN NPS) aims to reduce overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks.
- 9.9.3 The existing ecological baseline of the Site has been evaluated effectively, mitigation elements have been incorporated into the design both in terms of construction and operational requirements and the likely ecological potential additional impacts assessed. Habitats cleared for temporary construction purposes will be re-instated. The quantum of additional mitigation required for the permanent habitat loss has been calculated and will be delivered two secured areas totalling **7,920m²** of land and **3000m²** of buildings (that could have brown roofs) (see Volume 3, Drawing 9.5) with any shortfall being addressed via additional mitigation to be agreed with relevant stakeholder to ensure no net loss of biodiversity and enhancements were possible.
- 9.9.4 Providing the construction and operational adverse impacts shown in Table 9-11 and Table 9-14 in Section 9.7 are mitigated using the available areas of temporary land-take shown on Drawing 9.5, full compliance with the NN NPS will be ensured. The detail and mechanism for this mitigation will be presented in the ES for the DCO submission.

9.10 Summary

- 9.10.1 The impact assessment on Terrestrial Ecology has been assessed under 2006 Guidelines on Ecological Impact Assessment in the United Kingdom produced by CIEEM (Ref 9-3) with reference to DMRB guidance. These determine which ecological receptors are significant within a geographical context before the assessment of the impacts of the Scheme on significant receptors is undertaken.
- 9.10.2 A desk study and extended Phase 1 habitat survey followed up by targeted ecological surveys were undertaken in order to establish the ecological baseline, from which the ecological receptors of the Scheme could be identified.
- 9.10.3 The Site was found to be industrial in nature and predominantly comprised hard standing and buildings, with scattered semi-natural habitats that have value within this highly urbanised environment. A full

description of the results of the ecological baseline is provided in the main body of the report.

- 9.10.4 Most of the habitats on the Site have been evaluated as having little ecological value in less urbanised environments; however this Site is based in a heavily developed and industrial area with little alternative provision for biodiversity and have been considered with regards to current policy regarding no net loss. Other receptors included breeding birds, black redstart (protected under Schedule 1 of the Wildlife and Countryside Act and listed on the London Biodiversity Action Plan) and notable terrestrial invertebrates as suitable habitat for these species/species groups occurred on the Site.
- 9.10.5 A total of 16 receptors were assigned levels of value/importance under a geographical scale. Most were evaluated as being of site-level value, with mixed plantation, dense/continuous scrub, mature broad-leaved planted trees, species-poor semi-improved grassland, standing water/sludge lagoon, breeding birds and terrestrial invertebrates given local value. Based on the potential for it to occur on site, black redstart was assigned as being of county level.
- 9.10.6 The potential/likely beneficial or adverse impacts on the receptors following mitigation that has been built into the scheme design were evaluated and broken down into construction (temporary) impacts and operational (permanent) impacts, with the magnitude of the impact was assessed at a scale comparable with the DMRB methods. Eleven potential construction impacts were identified, ten of these were adverse and one beneficial (due to non-native invasive species removal). All of these were slight and as a result of temporary habitat loss.
- 9.10.7 Sixteen operational (long-term) impacts were identified. Fifteen of these were slight adverse effects due to direct habitat loss, with one slight beneficial effect due to non-native species removal.
- 9.10.8 Proposals for mitigation of all receptors, including general habitat loss and effects on breeding birds, black redstart and invertebrates and at least like-for-like replacement of ecologically valuable habitat are being developed. There are areas available from the temporary construction land take within the LLAU for bespoke mitigation, and biodiversity offsetting within the wider area which would achieve at least like-for like mitigation of likely impacts and potentially deliver enhancements. These requirements could be delivered via a project-specific BAP incorporating the quantum of habitat required and providing detailed guidance on the

design principles for the high-quality replacement habitats. Community and LPA engagement would be part of this process.

- 9.10.9 Any other proposed developments in the surrounding area were researched in order to evaluate whether there would be likely to be any cumulative effects on the Scheme's receptors as a result. There are proposed developments adjacent to the Site around most of its boundary, which could result in an additional long-term minor impact on breeding birds through noise and visual disturbance. However, the area is already highly developed and therefore any additional impact is unlikely to be significant.
- 9.10.10 Results of an arboricultural survey and bat activity surveys will be incorporated into the ES submission in order to confirm the required mitigation requirements along with the results of an updated extended Phase 1 habitat survey to confirm habitat replacement requirements.
- 9.10.11 There are no predicted adverse residual effects from the Scheme and the potential for beneficial effects.

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