



YOUR LONDON AIRPORT
Gatwick

*Our northern runway:
making best use of Gatwick*

Preliminary Environmental Information Report
Chapter 9: Ecology and Nature Conservation
September 2021

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9 Ecology and Nature Conservation

9.1. Introduction

9.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of the Environmental Impact Assessment (EIA) work undertaken to date concerning the potential effects of the proposal to make best use of Gatwick's existing runways (referred to within this report as 'the Project') on ecology and nature conservation.

9.1.2 This chapter identifies the potential effects of the Project on the ecology and nature conservation interest of the Project site and surrounding receptors.

9.1.3 In particular, this PEIR chapter:

- sets out the existing and future environmental baseline conditions, established from desk studies, surveys and consultation to date;
- presents the potential environmental effects on ecology and nature conservation arising from the Project, based on the information gathered and the analysis and assessments undertaken to date;
- identifies any assumptions and limitations encountered in compiling the environmental information; and
- highlights any necessary monitoring and/or mitigation measures that could prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process.

9.1.4 This chapter is accompanied by the following appendices:

- Appendix 9.3.1: Summary of Stakeholder Consultation;
- Appendix 9.2.1: Ecology and Nature Conservation Legislation;
- Appendix 9.2.2: Summary of Local Planning Policy;
- Appendix 9.6.1: Ecological Desk Study;
- Appendix 9.6.2: Ecology Survey Report;
- Appendix 9.6.3: Bat Trapping and Radio Tracking Surveys; and
- Appendix 9.9.1: Habitats Regulations (No Significant Effects) Report.

9.1.5 The PEIR will inform pre-application consultation. Following consultation, comments on the PEIR will be reviewed and taken into account in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate for development consent.

9.2. Legislation and Policy

Legislation

9.2.1 A range of legislation provides protection to habitats and species at an international, national and local level. Full details of the legislation relevant to this Project are provided in Appendix 9.2.1.

9.2.2 Key legislation relevant to ecology and nature conservation includes:

- The Conservation of Habitats and Species Regulations 2017, as amended;
- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- Countryside and Rights of Way (CRoW) Act 2000;

- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act 1992;
- Wild Mammals Protection Act 1996; and
- The Hedgerow Regulations 1997.

Planning Policy Context

National Policy Statements

- 9.2.3 The Airports National Policy Statement (NPS) (Department for Transport, 2018), although primarily concerned with a new runway at Heathrow Airport, remains a relevant consideration for other applications for airport infrastructure in London and the south east of England.
- 9.2.4 The 'Biodiversity and Ecological Conservation' section of the Airports NPS summarises the UK Government's biodiversity strategy (paragraph 5.84). The aim of the strategy is to *'halt biodiversity loss, support healthy, well-functioning ecosystems, and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.'*
- 9.2.5 This strategy is followed through the Airports NPS by reference to the National Planning Policy Framework (NPPF) which supports a movement from net loss of biodiversity, through an interim stage of no net loss and on to achieving net gains for nature (paragraph 5.85).
- 9.2.6 The NPS for National Networks (Department for Transport, 2015)¹ sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks and the policy against which decisions on major road and rail projects will be made. This has been taken into account in relation to the highway improvements proposed as part of the Project.
- 9.2.7 Table 9.2.1 provides a summary of the relevant requirements of the Airports NPS and NPS for National Networks and how these are addressed within the PEIR.

Table 9.2.1: Summary of NPS Information Relevant to this Chapter

Summary of NPS Requirement	How and Where Considered in the PEIR
Development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort appropriate compensation measures should be sought (Airports NPS Para. 5.96 and NPS for NN Para. 5.25).	Relevant baseline data have been collected to determine ecology features of concern, and to inform the assessment of effects, which sets out effects on designated sites, protected species and habitats and other species identified as being of principal importance for the conservation of biodiversity. The Project has taken into account the need to protect biodiversity and prevent significant harm. Mitigation measures described in this chapter and adopted as part of the Project include measures to protect and minimise the potential for effects on biodiversity. Details of compensation

¹It is noted that the Transport Decarbonisation Plan published by Department for Transport (DfT) on 14 July 2021 announced DfT's intention to review the NPS for National Networks in due course once demand patterns post-pandemic become clearer. It is understood DfT intends to commence the review by the end of 2021 and complete it by Spring 2023. In the interim and whilst the review is undertaken, DfT has confirmed the NPS for National Networks remains relevant government policy and has full force and effect for the purposes of the Planning Act 2008.

Summary of NPS Requirement	How and Where Considered in the PEIR
	<p>measures are provided where they are required as a last resort.</p> <p>Biodiversity losses will be calculated based on the design of the Project (including ancillary services, temporary works areas and linked transport infrastructure). All terrestrial and freshwater habitats that would be lost to development will be included within the biodiversity offsetting calculations that will be provided in the ES.</p> <p>Mitigation measures proposed as part of the Project are set out within this chapter and include habitat creation around the Project site, which would contribute to the overall effect in relation to biodiversity (Section 9.8).</p>
<p>Appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment (Airports NPS Para. 5.97 and NPS for National Networks Para. 5.25).</p>	<p>The ecology and nature conservation value of sites, species and habitats identified within the Project site boundary and within the relevant study area has been assessed and are explained in this chapter (Section 9.6). The value of each feature has informed the assessment of effects for the Project (Section 9.9).</p>
<p>The Secretary of State will ensure that the applicant's proposals to mitigate the harmful aspects of the development on Sites of Special Scientific Interest (SSSI) and, where possible, to ensure the conservation and enhancement of a SSSI's biodiversity or geological interest, are acceptable. Where necessary, requirements and / or planning obligations should be used to ensure these proposals are delivered (Airports NPS Para. 5.101 and NPS for National Networks Para. 5.29).</p>	<p>The Project would have no direct effect on SSSIs. Mitigation measures adopted as part of the Project for ecology and nature conservation are described in this chapter (Section 9.8). Measures include following best practice guidelines to ensure there is no significant effect on SSSIs.</p>
<p>Sites of regional and local biodiversity interest (which include Local Nature Reserves, Local Wildlife Sites and Nature Improvement Areas) have a fundamental role to play. The Secretary of State will give due consideration to such regional or local designations. Adequate compensation should always be considered, and ecological corridors and their physical processes should be maintained as a priority to mitigate widespread impacts (Airports NPS Para. 5.102 and NPS for National Networks Para. 5.31).</p>	<p>The Project would have no direct effect on Local Nature Reserves or Local Wildlife Sites due to the mitigation measures that would be put in place. Where practicable, opportunities to enhance the Project site for the benefit of biodiversity have been included in the design of the Project and are set out in this chapter (Section 9.8). These have been informed by baseline surveys (Section 9.6 and Appendix 9.6.2).</p> <p>The loss or covering of lengths of rivers and streams will be accounted for within the biodiversity offsetting metric described above. Due to the nature of rivers and</p>

Summary of NPS Requirement	How and Where Considered in the PEIR
	<p>streams, the potential to create multiple lengths of new channel is limited due to the hydrological effects that this would create in other areas of the catchment. Therefore, biodiversity gains for rivers and streams include restoration of existing watercourses, as well as any relevant channel creation. Restoration, where possible, would be targeted within the same rivers and streams in both upstream and downstream sections.</p>
<p>Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this (Airports NPS Para. 5.103 and NPS for National Networks Para. 5.32).</p>	<p>A series of species and habitat surveys have been undertaken in order to inform this assessment of effects. These are reported in Section 9.6 and Appendix 9.6.2.</p> <p>Opportunities to avoid effects on these features and habitats have been taken during the site selection process and mitigation measures have been designed into the Project to avoid effects on ancient woodland. These are reported in the Section 9.8.</p>
<p>The Secretary of State will consider whether the applicant has maximised opportunities for building in beneficial biodiversity as part of good design in and around developments, and particularly to establishing and enhancing green infrastructure (Airports NPS Para. 5.104 and NPS for National Networks Para. 5.33).</p>	<p>Where practicable, opportunities to enhance the Project site for the benefit of biodiversity have been included in the design of the Project and are set out in this chapter (Section 9.8). These have been informed by baseline surveys (Section 9.6 and Appendix 9.6.2). Opportunities for building in beneficial biodiversity in the Project design have been sought and these have included opportunities to establish and enhance green infrastructure.</p>
<p>In addition to the habitats and species that are subject to statutory protection or international, regional or local designation, other habitats and species have been identified as being of principal importance for the conservation of biodiversity in England and Wales and therefore requiring conservation action. The Secretary of State will ensure that the applicant has taken measures to ensure that these other habitats and species are protected from the adverse effects of development. Where appropriate, requirements or planning obligations may be used in order to deliver this</p>	<p>The assessment provided in this chapter considers designated sites, habitats and protected and otherwise notable species throughout the chapter, including species and habitats identified as being of principal importance.</p>

Summary of NPS Requirement	How and Where Considered in the PEIR
protection (Airports NPS Para. 5.105 and NPS for National Networks Para. 5.35).	
Appropriate mitigation measures should be included as an integral part of a proposed development, including identifying where and how these will be secured. The Secretary of State should consider what appropriate requirements should be attached to any consent and/or in any planning obligations entered into in order to ensure that mitigation measures are delivered (NPS for National Networks Para. 5.35).	This assessment provides details of the mitigation measures that have been designed into the Project (Section 9.8).

National Planning Policy Framework

- 9.2.8 The National Planning Policy Framework (NPPF) (Ministry of Housing, Community and Local Government, 2021) sets out the planning policies for England and is a material consideration in planning decisions.
- 9.2.9 The principle of sustainable development in the NPPF acknowledges the environmental role of planning in protecting and enhancing the natural environment and helping to improve biodiversity. The NPPF recognises that achieving sustainable development involves pursuing positive improvements in the natural environment.
- 9.2.10 Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' contains provisions for ensuring that planning can be sustainable from an environmental perspective. Specifically, paragraph 174 states that:

'...Planning policies and decisions should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.'*

9.2.11 Paragraph 180 goes on to state that:

'When determining planning applications, local planning authorities should apply the following principles:

- *if significant harm to biodiversity 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, then planning permission should be refused;*
- *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
- *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.'*

9.2.12 The NPPF also states (paragraph 182) that *'the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.'*

9.2.13 The NPPF is supported by the Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Effect within the Planning System, jointly issued by the Office of the Deputy Prime Minister and the Department for Environment, Food and Rural Affairs (Defra) (ODPM, Defra, 2005). This joint circular aims to provide *'guidance on the application of the law in relation to planning and nature conservation as it applies in England.'*

9.2.14 The Government Circular makes reference to the UK Biodiversity Action Plan (BAP), England Biodiversity Strategy and Local Biodiversity Partnerships. These documents outline strategic actions for biodiversity at both the national and local level and are considered further below under Wildlife Legislation.

9.2.15 In June 2021, the government published a proposed amendment to the Environment Bill to include a biodiversity net gain requirement for nationally significant infrastructure projects (NSIPs). It is likely that the requirement to deliver biodiversity net gain will be through the relevant NPS or through separate sector-specific statements.

National Planning Practice Guidance

9.2.16 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities and Local Government, 2019) supports the NPPF and provides guidance across a range of topic areas.

9.2.17 The guidance states that the planning system should conserve and enhance the natural and local environment and requires local planning authorities to consider the opportunities that proposed developments may provide to conserve and enhance biodiversity and contribute to habitat connectivity in the wider area.

Local Planning Policy

9.2.18 Gatwick Airport is located in the county of West Sussex and immediately adjacent to the bordering county of Surrey. Gatwick Airport lies within the administrative area of Crawley Borough Council and adjacent to the boundaries of Mole Valley District Council to the north west, Reigate and Banstead Borough Council to the north east and Horsham District Council to the south west. The administrative area of Tandridge District Council is located approximately 1.9 km to the east of Gatwick Airport, while Mid Sussex District Council lies approximately 2 km to the south east.

9.2.19 The relevant local planning policies applicable to ecology and nature conservation based on the extent of the study area for this assessment are summarised in Table 9.2.2, with further details provided in Appendix 9.2.2.

Table 9.2.2: Local Planning Policy

Administrative Area	Plan	Policy
Adopted Policy		
Crawley	Crawley 2030: Crawley Borough Local Plan 2015-2030 (2015)	ENV2: Biodiversity
Reigate and Banstead	Reigate and Banstead Local Plan: Core Strategy 2014	CS2: Valued Landscapes and the Natural Environment
	Reigate and Banstead Local Plan Development Management Plan 2018-2027 (2019)	NHE2: Protecting and Enhancing Biodiversity and Areas of Geological Importance
		NHE3: Protecting Trees, Woodland and Natural Habitats
		NHE4: Green and Blue Infrastructure
Tandridge	Tandridge District Core Strategy 2008	CSP17: Biodiversity
	Tandridge District Core Strategy 2008. Tandridge Local Plan. Part 2: Detailed Policies 2014-2029 (2014)	DP19: Biodiversity, Geological Conservation and Green Infrastructure
Mid Sussex	Mid Sussex District Plan 2014-2031 (2018).	DP17: Ashdown Forest SPA and SAC
		DP36: Historic Parks and Gardens
		DP37: Trees, Woodland and Hedgerows
		DP38: Biodiversity
		C5: Areas of Importance for Nature Conservation

Administrative Area	Plan	Policy
	Mid Sussex Local Plan 2004 (saved policies)	C6: Trees, Hedgerows and Woodlands
Horsham	Horsham District Planning Framework (2015)	Policy 25: The Natural Environment and Landscape Character
		Policy 31: Green Infrastructure & Biodiversity
Mole Valley	Mole Valley Core Strategy 2009	CS15: Biodiversity and Geological Conservation
	Mole Valley Local Plan 2000	ENV11: Local and non-statutory nature reserves
		ENV12: Sites of Nature Conservation Importance and Potential Sites of Nature Conservation Importance
		ENV13: Features of Local Importance for Nature Conservation
		ENV14: Enhancement, management and creation of nature conservation features
ENV15: Species Protection		
Emerging Policy		
Crawley	Draft Crawley Borough Local Plan 2021-2037 (2021)	G11: Green Infrastructure
		G12: Biodiversity Sites
		G13: Biodiversity and Net Gain
		SD1: Presumption in Favour of Sustainable Development
Mole Valley	Future Mole Valley 2018-2033 Consultation Draft Local Plan (2020)	EN9: Enhancing Biodiversity EN11: Green Infrastructure and Play Space
Horsham	Draft Horsham District Local Plan 2019-2036 (2020)	Strategic Policy 27 - The Natural Environment and Landscape Character Strategic Policy 31 - Green Infrastructure and Biodiversity
Tandridge	Our Local Plan 2033 (2019)	TLP35: Biodiversity, Ecology & Habitats
		TLP36: Ashdown Forest SPA

9.3. Consultation and Engagement

- 9.3.1 In September 2019, Gatwick Airport Limited (GAL, 2019) submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects and, where necessary, to determine suitable mitigation measures for the construction and operational phases of the Project. It also described those topics or sub-topics which are proposed to be scoped out of the EIA process and provided justification as to why the Project would not have the potential to give rise to significant environmental effects in these areas.

- 9.3.2 Following consultation with the statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on 11 October 2019 (Planning Inspectorate, 2019).
- 9.3.3 Key issues raised during the scoping process specific to ecology and nature conservation are listed in Table 9.3.1, together with details of how these issues have been addressed within the PEIR.

Table 9.3.1: Summary of Scoping Responses

Details	How/Where Addressed in PEIR
Planning Inspectorate	
Notes the potential need to carry out an assessment under The Conservation of Habitats and Species Regulations 2017 (now amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) (the Habitats Regulations). This assessment must be coordinated with the EIA in accordance with Regulation 26 of the EIA Regulations. The Applicant's ES should therefore be coordinated with any assessment made under the Habitats Regulations	The need for assessment under the Habitats Regulations has been considered throughout the EIA process. The findings of this are presented in Appendix 9.9.1: Habitats Regulations (Non-significant Effects) Report.
The Scoping Report includes no evidence relating to wintering birds, amphibians and terrestrial mammals. For the avoidance of doubt the ES should assess the impacts to these ecological receptors where a likely significant effect could occur.	Surveys have been undertaken for wintering birds, amphibians and terrestrial mammals and survey results are reported in Section 9.6. Effects are reported in Section 9.9.
The Scoping Report does not provide information demonstrating an absence of hydrological pathways from the Proposed Development to European Designated sites. In absence of such information the Inspectorate cannot agree to scope this matter out. The ES should include an assessment of the impacts from dust or changes in water quality at European Designated sites where significant effects are likely to occur.	An assessment of effects on European designated sites is provided within Section 9.9 of this chapter and within the Habitats Regulations (Non-significant Effects) Report included in Appendix 9.9.1, which considers the potential for effects on European designated sites.
Biodiversity Opportunity Areas (BOAs) and Sites of Nature Conservation Importance (SNCIs) are not listed as locally designated sites to be included in the ES assessment. The ES should include these sites as potential ecological receptors in the assessment of significant effects	SNCIs are included as locally designated sites within this assessment (see Appendix 9.6.1 and Table 9.6.1). No details of BOAs were provided as part of the desk study exercise. Further information has been requested which will be included within the ES.
The ES should include an assessment of the potential impacts to ecology from changes in watercourse flows and drainage systems during the construction and operation of the Proposed Development.	The ecological assessment provided in this chapter has taken into consideration the hydrological

Details	How/Where Addressed in PEIR
<p>The Inspectorate recognises the degree of overlap between the ecological and hydrological assessment in this regard and therefore that there will need to be a degree of overlap and cross referencing between these aspects.</p>	<p>assessment set out in Chapter 11: Water Environment.</p>
<p>It remains unclear whether fish species are scoped in or out of the ES as the Scoping Report determines that fish surveys are only to be undertaken should the Proposed Development warrant direct works or changes to watercourses. The ES should scope fish species in to the assessment and assess both indirect impacts and direct impacts on such species; this should cross refer to other assessments in the ES such as the Water Environment.</p>	<p>Fish surveys of the River Mole have been undertaken and are reported in Appendix 9.6.2, with an assessment of effects in Section 9.9.</p>
<p>The Scoping Report omits ancient and veteran trees as sensitive habitats that should be assessed. However, the Scoping Report does not provide evidence to suggest they are not present within the study area. Figures 5.2.1(e and f) indicate potential areas for flood compensation and construction compounds respectively adjacent to ancient woodland areas as identified by the Forestry Commission. The ES should consider the potential impacts and disturbance within the buffer zone of the ancient woodland and consider appropriate mitigation. Site investigations should be carried out to determine whether they are present within the study area of the Proposed Development and if so, impacts to ancient and veteran trees and ancient woodland should be assessed where significant effects are likely to occur and mitigation measures proposed where necessary.</p>	<p>No ancient or veteran trees that would be affected by the Project were identified during the Phase 1 habitat survey. Ancient woodland was identified within the Project site boundary and is reported in the desk study report at Appendix 9.6.1 and summarised in Section 9.6. Mitigation measures designed into the Project to avoid effects on ancient woodland are described in Table 9.8.1 and potential effects are described in Section 9.9. Opportunities to avoid effects on these features and habitats have been taken during the site selection process (see Chapter 3: Need and Alternatives).</p>
<p>The assessment of ecological effects in the ES should be undertaken in accordance with the new, updated CIEEM Ecological Impact Assessment Guidelines published in September 2019.</p>	<p>The assessment is based on the 2019 guidance.</p>
<p>The definitions of notable species and habitats should be refined in the ES and include 'priority' species and habitats in line with the NERC Act 2006. Additionally, any mitigation and monitoring measures considered should account for the identified priority habitats and species where appropriate.</p>	<p>Priority habitats and species have been identified as Important Ecological Features in Table 9.6.2 and any potential effects on them are described in Section 9.9.</p>
<p>The Scoping Report doesn't explain in detail how the Proposed Development's Zone of Influence (ZoI) has been determined and how it relates to the study areas applied in the ecological assessments (2 km for protected species, 500 metres up and downstream for aquatic fauna). Potential impacts to the Thames Basin Heaths Special Protection Area (SPA) have also apparently been omitted. The</p>	<p>The ZoI for the Project was determined based on the Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019) combined with that adopted in previous studies in relation to expansion at Gatwick, work</p>

Details	How/Where Addressed in PEIR
<p>Applicant should ensure that any assessments in the ES relate to the extent of the Zol and ensure that all potential impacts with a likely significant effect on sensitive receptors are assessed.</p>	<p>undertaken by the Airports' Commission in respect of a second runway, in particular. However, as noted in the Scoping Report (para 7.3.8), the study area (and hence Zol) for both protected species (bats, in particular) and designated sites responds to the findings of both survey work and other modelling of traffic flows with the Zol adjusted accordingly. Impacts to the Thames Basin Heaths SPA have been considered and are reported within Appendix 9.9.1: Habitats Regulations (Non-significant Effects) Report.</p>
<p>The Scoping Report proposes that anticipated change in traffic flows on routes serving the site, will be an indicator of impacts for the purposes of the assessment. Ecologically designated sites within 200 metres of these routes will be included within the study area. In the ES assessment, this should also include habitats and protected species.</p>	<p>The effects of changes in traffic flows on sites and habitats/species they support are considered in Section 9.9.</p>
<p>The ES should explain which species are regarded as being 'mobile' for the purposes of the assessment. Surveys are proposed for bats, aquatic mammals and potentially fish but surveys for other relevant mobile species should be undertaken, particularly in relation to birds located within the Proposed Development's Zol.</p>	<p>Surveys have been undertaken for a range of species that could potentially be affected by the Project, if present. This includes surveys for mobile species and include wintering and breeding bird surveys. The survey findings are provided in Section 9.6.</p>
<p>The Scoping Report provides sparse detail on the mitigation proposed and uses vague wording such as 'may' meaning it remains unclear what mitigation is proposed where. The ES should clearly present the mitigation required to address significant effects and ensure this is secured appropriately, eg as part of a landscaping and ecological management plan to be secured by requirements in the DCO. Draft or finalised management plans should be provided with the ES.</p>	<p>Details of mitigation measures designed into the Project at this stage are described in Table 9.8.1. This will be developed further for the ES (including the provision of draft/outline management plans where appropriate).</p>
<p>Impacts resulting from implementation of proposed mitigation should be assessed where significant effects may occur. This is particularly relevant to proposed bird mitigation measures and the potential for collision risk. The Applicant should make efforts to ensure that mitigation areas do not result in increased hazards to air traffic.</p>	<p>Details of mitigation measures designed into the Project at this stage are described in Table 9.8.1. These have been designed in consultation with the airport's Bird Hazard</p>

Details	How/Where Addressed in PEIR
	Management team to ensure no increased risk to air traffic.
Monitoring of the effects of nitrogen deposition should be included in the proposed/ongoing surveys to inform the assessment of likely significant effects and any subsequent remedial measures for the ES, particularly for receptors sensitive to such changes including (but not limited to) Ashdown Forest Special Area of Conservation (SAC) and Special Protection Area (SPA), Mole Gap and Reigate escarpment SAC, botanical receptors and areas of ancient woodland/notable trees.	Effects on European designated sites are provided within Section 9.9 of this chapter and within the Habitats Regulations (Non-significant Effects) Report included in Appendix 9.9.1. Effects on ancient woodland and notable trees are assessed in Section 9.9.

9.3.4 Key issues raised during consultation and engagement with interested parties specific to ecology and nature conservation are listed in Table 9.3.2, together with details of how these issues have been addressed within the PEIR.

Table 9.3.2: Summary of Consultation

Consultee	Date	Details	How/where addressed in PEIR
Natural England meetings via Discretionary Advice Service	15/04/2019	Proposed survey methodology with respect to protected species with particular focus on bats discussed.	The survey methodologies were devised considering advice provided by Natural England. The methodologies are described in paragraphs 9.4.14 to 9.4.61.
		Potential scope of Habitats Regulations Assessment (HRA), including with respect to effects of changes to air quality on sites in surrounding landscape and effects on SACs designated for bat interest.	The scope of the No-Significant Effects Report considered the advice provided by Natural England. The report is provided in Appendix 9.9.1.
	28/01/2020	Scope of HRA with respect to air quality	The scope of the No-Significant Effects Report considered the advice provided by Natural England. The report is provided in Appendix 9.9.1.
	13/02/2020	Survey results in 2019 and approach to pre-commencement surveys. Agreed ES would be based on data collected in 2019 and updated as necessary pre-commencement.	Surveys will be updated pre-commencement, as required.

Consultee	Date	Details	How/where addressed in PEIR
	24/05/2021	Project re-start and re-engagement with NE	N/A
	21/06/2021	Scope of HRA with respect to which designated sites to include, following expansion of traffic modelling.	The scope of the No-Significant Effects Report considered the advice provided by Natural England. The report is provided in Appendix 9.9.1.

9.4. Assessment Methodology

Relevant Guidance

9.4.1 The following guidance has been used to inform the assessment of likely effects, where relevant:

- British Standards Institution (2013) Biodiversity – Code of Practice for Planning and Development: BS 42020:2013;
- Chartered Institute of Ecology and Environmental Management (2019) Guidelines for Ecological Impact Assessment in the United Kingdom;
- Ministry of Housing, Communities and Local Government (2019b) Planning Practice Guidance: Natural Environment – Biodiversity, Ecosystems and Green Infrastructure;
- Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment; and
- Civil Aviation Authority (CAA) (2017) Wildlife Hazard Management at Aerodromes.

9.4.2 Guidance relevant to other specific species groups has also been considered and is set out in the relevant sections of this chapter.

Scope of the Assessment

9.4.3 The scope of this PEIR has been developed in consultation with relevant statutory and non-statutory consultees as detailed in Table 9.3.1 and Table 9.3.2.

9.4.4 Taking into account the scoping and consultation process, Table 9.4.1 summarises the issues considered as part of this assessment.

Table 9.4.1: Issues Considered within the Assessment

Activity	Potential Effects
Construction Phase (including Demolition)	
Construction and	Effects on designated sites and habitats as a result of construction activity including habitat severance and loss of ecological connectivity, habitat disturbance (eg light, noise pollution/ introduction of toxic pollutants), changes to water quality/flow and changes in air quality

Activity	Potential Effects
demolition activities	(emissions from traffic and dust). Effects on species valued as important features of designated sites.
	Effects on habitats (set out above) as a result of construction activity eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/introduction of toxic pollutants), through changes to air and water quality/flow.
	Effects on species as a result of construction activity within airport boundary (eg direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species, changes to water quality).
Construction of highways improvements	Effects on habitats as a result of construction of upgraded highway junctions (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/introduction of toxic pollutants), changes to air and water quality/flow).
	Effects on species as a result of construction of upgraded highway junctions (eg direct killing/injury through activity/pollution, disturbance by increased noise/light, loss of foraging/commuting habitat).
Use of construction compounds and creation of mitigation areas	Effects on habitats, including ancient woodland, as a result of use of construction compounds and creation of mitigation areas beyond the airport boundary (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/ introduction of toxic pollutants), introduction or spread of invasive species (in particular along the water courses within the airport and surrounding land), changes to air/water quality/flow).
	Effects on species as a result of use of construction compounds and creation of mitigation areas beyond the airport boundary (eg direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species)
Operational Phase	
Use of airport, including upgraded highway junctions	Effects on designated sites (set out above) as a result of changes to air quality both from airport operations and traffic emissions.
	Effects on habitats as a result of operational activity, including light and noise, as well as from changes to air quality both from airport operations and traffic emissions (air traffic movements and surface access) (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/introduction of toxic pollutants)).
	Effects on species as a result of operational activity (including light and noise) (eg direct killing or injuring of fauna (including bird/bat strike from increased air traffic movements and road traffic collisions), disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species).

9.4.5 Effects which are not considered likely to be significant have been scoped out of the assessment. A summary of the effects scoped out are presented in Table 9.4.2.

Table 9.4.2: Issues Scoped Out of the Assessment

Issue	Justification
Effects on designated sites arising from direct habitat loss.	No habitat loss would occur within any of the identified designated sites, at European, national or local level. Therefore, no impact pathway would exist.

Study Area and Zone of Influence

- 9.4.6 For the majority of surveys, the study area was the Project site boundary. However, surveys for more mobile and sensitive species such as bats, birds and otters have been extended beyond the Project site boundary.
- 9.4.7 The study area for the desk study for this assessment included a 20 km buffer for European designated sites and 5 km buffer for nationally and locally designated sites. A 10 km buffer was used to gather records for bats and otter. Records of other protected and notable species were gathered from within a 2 km buffer.

Designated Sites

- 9.4.8 The initial search area for European designated sites (including SACs, SPAs and Ramsar sites) was 20 km from the Project site boundary to allow for effects arising from vehicle emissions. This buffer was extended for SACs designated for bats within 30 km of the Project site.
- 9.4.9 An initial buffer of 5 km for other sites (SSSIs, National Nature Reserves (NNRs), Local Nature Reserves (LNRs) and locally-designated sites) was used for the data search to allow for effects arising from works at the Project site and effects arising from changes to surface access arrangements. An initial 5 km buffer is considered appropriate since this recognises that effects due to surface access arrangements may occur at some distance from the Project site.

Protected and Notable Species

- 9.4.10 Records of protected or otherwise notable species were requested from the local records centres within a 2 km radius of the Project site boundary, except for otters and bats where a larger 10 km radius was used.
- 9.4.11 The survey area for the majority of surveys was within the Project site boundary. However, it is recognised that effects on ecological receptors can occur beyond such limits, especially for mobile species such as bats and birds. Barriers to dispersal have been considered in survey designs, for example where great crested newt (GCN) ponds have been discounted due to them being separated from the Project site by major roads. Additional surveys are planned to further assess any potential effects where land access was not available or due to the knowledge gained during the earlier surveys and as the Project design has evolved.
- 9.4.12 The survey area has included the major watercourses that flow through the Project site to identify any potential sign of otters/water voles. For the ES, this is proposed to be extended to include up to 500 metres both upstream and downstream of the watercourses, where access permits.

Zone of Influence

- 9.4.13 The study areas for both designated sites and species have been used to determine the Zol for the assessment of effects. This means that the Zol has also adapted and responded as survey/modelling data are collected.

Methodology for Baseline Studies

Desk Study

- 9.4.14 Information on ecology and nature conservation within the desk study search area was collected through a data gathering exercise in 2019 to obtain information relating to statutory and non-statutory nature conservation sites, priority habitats and species, and legally protected and controlled species. A review of existing studies and datasets was also undertaken. The desk-based work will be updated as necessary throughout the EIA process.
- 9.4.15 Details of the organisations and individuals contacted to obtain ecological data are provided in Appendix 9.6.1: Ecological Desk Study, and comprised:
- Sussex Biodiversity Record Centre;
 - East Surrey Badger Protection Society;
 - West Surrey Badger Group;
 - Badger Trust-Sussex;
 - Surrey Biodiversity Information Centre; and
 - R. Bicker, Gatwick Airport Biodiversity Consultant (Bicker, 2018).
- 9.4.16 The desk study data will be updated further prior to ES submission to check for any new records arising since the desk study was undertaken.

Site-Specific Surveys

- 9.4.17 The scope and methodology of surveys undertaken for the Project were determined following an assessment of site conditions. The following site-specific surveys were conducted and are described below:
- phase 1 habitat survey;
 - hedgerow survey;
 - badger survey;
 - bat activity, emergence and trapping surveys;
 - breeding bird survey;
 - wintering bird survey;
 - dormouse survey;
 - great crested newt survey;
 - reptile survey;
 - water vole and otter survey;
 - national vegetation classification survey;
 - fish survey; and
 - invertebrate habitat appraisal.
- 9.4.18 A summary of the methodologies used is provided below, with full details and plans showing survey areas provided in Appendix 9.6.2: Ecology Survey Report and confidential Appendix 9.6.4 Badger Survey Report.

Phase 1 Habitat Survey

- 9.4.19 The methodology and habitat descriptions used were based on the standard Joint Nature Conservation Committee (JNCC) Phase 1 habitat survey methodology 'Handbook for Phase 1 Habitat Survey' (JNCC, 2010).
- 9.4.20 The Phase 1 habitat survey was carried out on 18 to 22 March and on 10 and 11 July 2019. The Phase 1 survey covered the Project site boundary.
- 9.4.21 Habitats identified during the survey were described using the categories set out in the Phase 1 Survey handbook (JNCC, 2010).
- 9.4.22 Together with the desk study, the Phase 1 habitat survey identified the further Phase 2 surveys needed for protected and otherwise notable species. These are described below.

Hedgerow Survey

- 9.4.23 A hedgerow survey was undertaken to establish which hedgerows (if any) would qualify as 'Important' under the Hedgerow Regulations 1997.
- 9.4.24 The surveys were undertaken on 5 - 8 August 2019. The surveys took into account guidance provided in the Hedgerow Survey Handbook (Department for Environment, Food and Rural Affairs (Defra), 2007) and the Hedgerow Regulations 1997. For the purposes of this survey, only hedgerows over 30 years old were included, as defined in the Hedgerow Regulations (1997) Section 4a.
- 9.4.25 The survey included all species-rich hedgerows within the Project site boundary.

Badger Survey

- 9.4.26 A badger survey was carried out during on 5 – 9 August 2019. The survey covered the Project site boundary area and was based on standard survey practice for badgers and sought to identify and record all signs of badger activity. Any incidental signs of badger activity were also noted during the course of other survey work undertaken on site.

Bat Surveys

- 9.4.27 A range of bat surveys were undertaken based on methods proposed in the document 'Bat Surveys - Good Practice Guidelines' (Bat Conservation Trust, 2016).
- 9.4.28 Twice monthly bat activity surveys were undertaken between April and September 2019. A total of six transect routes were surveyed which covered the areas of suitable habitat for foraging and commuting bats on the site.
- 9.4.29 In addition to the transect surveys, static automated surveys of bat activity at key points were conducted between April and October 2019. These surveys used bat detectors placed in particular locations to monitor bat activity continuously over a period of several days. These surveys were undertaken in locations which were likely to be used by the rarer species, particularly Bechstein's bats.
- 9.4.30 Further data on bat activity for land not surveyed during the 2019 surveys were gathered during August to October 2020. These surveys are ongoing (during 2021) and the findings will be reported in the ES.

- 9.4.31 With respect to roosting bats, a walkover survey was conducted between 18 – 22 March 2019 to identify buildings with potential to support bat roosts. Two buildings were identified within the Project site boundary and in July, August, September and October 2019 evening emergence and dawn re-entry surveys were undertaken to identify whether bats were emerging from or returning to them.

Bat Trapping

- 9.4.32 Trapping surveys were undertaken during three periods which corresponded with key stages of the annual life cycle of bats. The surveys were undertaken between 28-30 May 2019 (maternity), 15-17 July 2019 (post-maternity) and 2-4 September 2019 (autumnal dispersal). Additional surveys were completed in July 2020 and September 2020.
- 9.4.33 Trapping focused more intensively on parts of the Project site that may be of importance to bats, such as locations of known roosts and areas of high suitability foraging/commuting habitat. The full details of the trapping locations are shown in Appendix 9.6.3.

Radio-tracking

- 9.4.34 Bats were selected for radio-tagging on the basis of their species and apparent health and body condition. Female bats, and in particular reproductive females (avoiding heavily pregnant bats), were radio-tagged in preference to male bats to enable identification of the location of breeding colonies.
- 9.4.35 Species selected for radio-tagging focused on the woodland assemblage of bats and/or rarer species and included alcathe bat, barbastelle, Bechstein's bat, Brandt's bat, brown long-eared bat, Daubenton's bat, grey long-eared bat, Nathusius' pipistrelle, Natterer's bat and whiskered bat.
- 9.4.36 Each bat fitted with a radio-tag was followed for a minimum of three nights and a maximum of seven nights, depending on the results obtained from the estimates of home range analysis.

Wintering Bird Surveys

- 9.4.37 Wintering bird surveys were undertaken within the Project site boundary. The wintering bird surveys were based on a transect survey methodology as detailed in Bibby *et al.* (2000) and Gilbert *et al.* (1998). Surveys for wintering birds were undertaken between October 2018 and March 2019. A total of five survey visits were undertaken, each over two consecutive days.

Breeding Bird Surveys

- 9.4.38 Breeding bird surveys were undertaken within the Project site boundary. These surveys were carried out in accordance with a standard territory mapping methodology as outlined in Gilbert *et al.* (1998) and Bibby *et al.* (2000). Visits were undertaken on 27 & 28 March, 9, 10, 23 & 24 April, 7, 8, 21 & 22 May and 5, 6 & 27 June 2019.

Dormouse Surveys

- 9.4.39 Dormouse surveys were undertaken based on the methodology and best practice guidelines and recommendations described in the Dormouse Conservation Handbook (Bright *et al.*, 2006).

9.4.40 Dormouse nest tubes were installed on 1 - 4 April, 9 - 11 April and 29 May 2019 within woodland and hedgerows within the Project site boundary. Each tube was checked monthly, between May and October 2019.

Great Crested Newt Survey

9.4.41 Waterbodies within the Project site boundary were identified during a desk based study using Ordnance Survey mapping and aerial photography and during the Phase 1 habitat survey.

9.4.42 A Habitat Suitability Index (HSI) assessment was subsequently undertaken to determine the value of ponds as breeding sites for GCN.

9.4.43 GCN presence/absence surveys were carried out using a combination of traditional methods (bottle trapping, torching and egg searches) and using the environmental DNA (eDNA) technique. The surveys were undertaken on ponds within 250 metres of the Project site boundary which had an HSI score of 'Average' or above, and which were accessible.

9.4.44 The eDNA surveys were undertaken on 17 April 2019, which falls within the optimum period for this type of survey and followed the eDNA surveying and laboratory analysis guidance (Biggs *et al.*, 2014).

9.4.45 Population class size surveys were undertaken on ponds found to support GCN from the presence/absence surveys. The presence/absence and population class size surveys were undertaken between April and June 2019 following the guidance provided in the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

Reptile Surveys

9.4.46 A reptile survey was undertaken between April and early October 2019. This survey was undertaken for areas identified during the Phase 1 habitat survey as providing potentially suitable reptile habitat.

9.4.47 The survey was undertaken having regard to the methodology described in the Froglife Advice Sheet 10: Reptile Survey (Froglife, 1999) and the JNCC Herpetofauna Workers' Manual (Gent and Gibson, 2003).

9.4.48 The recommended survey methodology contained in the Design Manual for Roads and Bridges (Highways England *et al.*, 2020a) includes a combination of direct observation and artificial refugia based surveys. Artificial refugia were laid out in suitable locations.

9.4.49 Findings from the survey were used to estimate population sizes for the reptile species recorded at each site, by employing the method suggested in Froglife (1999).

Water Vole and Otter Survey

9.4.50 Otter and water vole surveys were undertaken on 13 and 14 May 2019. Watercourses within the Project site boundary were surveyed for signs that could indicate the presence of either otters or water voles.

9.4.51 The otter survey was undertaken with regard to the methodology described in the Design Manual for Roads and Bridges, LD118 (Highways England *et al.*, 2020a). The methodology was developed for linear schemes which may affect otter habitats or populations.

- 9.4.52 The water vole survey was based on the survey methodology described in Water Vole Conservation Handbook (Strachan, Moorhouse and Gelling, 2011).

Invertebrate Habitat Appraisal

- 9.4.53 An invertebrate habitat appraisal was undertaken in June 2019. This survey identified potential areas of interest for terrestrial and aquatic invertebrates by an invertebrate specialist. The appraisal identified the areas where future, more detailed terrestrial and aquatic invertebrate surveys would be required and their scope.

Terrestrial Invertebrate Survey

- 9.4.54 Walk-over surveys for terrestrial invertebrates were completed on six occasions during 2020 – 27 May, 19 June, 22 June, 30 June, 10 September and 14 September 2020. These focused on areas along the River Mole and the Gatwick Stream. On each occasion, the areas were walked by an experienced entomologist who sampled along each transect using sweep netting, a beating tray and stout trowel.
- 9.4.55 The survey concentrated on the following major groups (orders): Coleoptera (beetles), Diptera (flies), Hemiptera (bugs, froghoppers, etc), Hymenoptera (bees, wasps and ants) and Lepidoptera (butterflies and moths). Some examples of other groups were noted if found.
- 9.4.56 Samples were collected for later laboratory identification.

Aquatic Macroinvertebrate Survey

- 9.4.57 Following an initial scoping walk-over, 100 m sections of both the River Mole and Gatwick Stream were identified for detailed survey as representative of the site. Three survey visits were undertaken during 2020; 4 June, 29 July and 29 September. Samples were collected at each of the sites using the Whalley Hawkes Paisley Trigg (WHPT) method comprising a standard three-minute kick sample using a long-handled pond net with 1 mm mesh size, which was supplemented by a one-minute hand search.

Fish Survey

- 9.4.58 Fish surveys were undertaken using the catch depletion method in order to assess species composition, age structure and to estimate population size. Surveys were undertaken by an accredited electric fishing team comprising three members of staff. Surveys and analysis conformed to the relevant guidance outlined in BS EN 14011:2003 Water Quality: Sampling of Fish with Electricity (British Standards Institute, 2003).
- 9.4.59 Surveys were undertaken in spring (04 June) and autumn (29 September) 2020 along the same 100 m stretches used for the aquatic invertebrate surveys.

Botanical Survey and National Vegetation Classification Survey

- 9.4.60 A national vegetation classification (NVC) survey (JNCC, 2006) was undertaken in April, July and August 2019 to investigate habitats of raised conservation interest. The potential areas of interest were identified from the Phase 1 habitat mapping and were visited by a botanist.
- 9.4.61 The botanist also undertook a search for protected and notable flora and invasive plant species within the Project site boundary.

Survey Limitations

- 9.4.62 All seasonally dependent surveys were undertaken at optimal times of the year and under suitable weather conditions. Therefore, survey timing did not represent a survey limitation for the assessment.
- 9.4.63 It was not possible to obtain access to survey every area identified as having the potential to support protected species (particularly areas located outside of the Project site boundary). This is a particular limitation with respect to potential effects on great crested newts and bats.
- 9.4.64 It should also be noted that all surveys have inherent limitations in their design and are indicative of what is happening at a particular point in time, however, appropriate assumptions based on the information available have been made for the purposes of assessment.
- 9.4.65 Full details of survey limitations are provided in Appendices 9.6.2 and 9.6.3.

Assessment Criteria and Assignment of Significance

- 9.4.66 The significance of an effect is determined based on the sensitivity of a receptor and the magnitude of an impact. This section describes the criteria applied in this chapter to characterise the sensitivity of receptors and magnitude of potential impacts. The terms used to define magnitude and sensitivity are based on and have been adapted from those used in the Design Manual for Roads and Bridges (DMRB) methodology (Highways England *et al.*, 2020b), which is described in further detail in Chapter 6: Approach to Environmental Assessment.

Receptor Sensitivity/Value

- 9.4.67 Several factors have been taken into consideration when assessing the value of an ecological feature and whether it is considered important and therefore requires assessment.
- 9.4.68 In assessing the value of habitats or species populations, a subjective assessment has been made, based on a range of factors that influence overall ecological value. Amongst other factors, a series of criteria have been considered for habitats and populations of species including: fragility, rarity, extent, diversity, position in the landscape, naturalness, and recorded history.
- 9.4.69 Other resources that have been used to inform the assessment of value and importance include, but are not limited to:
- UK legislation;
 - Habitats and Species of Principal Importance (Section 41 of the NERC Act, 2006);
 - Birds of Conservation Concern (BoCC) Red and Amber lists; and
 - National and County Red Data Book species.
- 9.4.70 The resources used to assess the value and importance of features also help to define the importance in the context of geographical scale. The CIEEM guidelines (CIEEM, 2019) state that significance of effects on ecological features should be qualified with reference to the appropriate geographic scale. Therefore, to provide a framework that is consistent for both assessing the importance of ecological features and determining the significance of effects, the importance of ecological features has been described using the following geographic scales:
- international;
 - national;

- regional (south east England);
- county;
- local; and
- site and immediate surroundings.

9.4.71 Table 9.4.3 below indicates how the value of receptors has been described within this assessment.

Table 9.4.3: Sensitivity Criteria

Sensitivity	Definition
Very High (International)	An internationally designated site or candidate site, such as a Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar Site, Biosphere Reserve or an area Natural England has determined meets the published selection criteria for such a designation, irrespective of whether or not it has yet been notified.
High (National)	A nationally designated site, eg SSSI, National Nature Reserves (NNR), Marine Nature Reserves or an area which Natural England has determined meets the published selection criteria for national designation (eg SSSI selection guidelines irrespective of whether or not it has yet been notified).
Medium (Regional/County)	Viable areas of habitat identified in a County Biodiversity Action Plan (BAP) or designated as a Local Wildlife Site (LWS), a local significant population of a species identified as important on a county basis, such as a County BAP.
Low (Local)	Diverse and/or ecologically valuable habitats not of County importance.
Site	Features of value to the immediate area only.
Negligible	Commonplace feature of little or no habitat/historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.

Magnitude of Impact

9.4.72 Impacts may be described in terms of changes to the structure or function of an ecological resource and are characterised according to a number of parameters where these are relevant. These parameters include:

- beneficial or adverse – impacts may be either, depending on the nature of the impact;
- extent - the geographical range over which the impact occurs;
- magnitude – the size of the impact in terms of amount of a feature affected;
- duration and timing – when the impact would occur and how long it would last;
- frequency – whether the impact would be a single event or multiple events; and
- reversibility – the impact may be permanent, or may naturally reverse without mitigation, or may be reversible with appropriate mitigation.

9.4.73 Table 9.4.4 below indicates how the magnitude of impacts has been described within this assessment.

Table 9.4.4: Impact Magnitude Criteria

Magnitude of Impact	Definition
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Medium	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Low	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristic, feature or element; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance of Effect

- 9.4.74 The significance of an effect has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact. The method employed for this assessment is presented in Table 9.4.5. Where a range of significance levels are presented, the final assessment for each effect is based upon professional judgement.
- 9.4.75 In all cases, the evaluation of receptor sensitivity, impact magnitude and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.
- 9.4.76 For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 9.4.5: Assessment Matrix

Sensitivity	Magnitude of Impact				
	No Change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major or Substantial
Very High	No change	Minor	Moderate or Major	Major or Substantial	Substantial

9.4.77 A description of the significance levels is as follows.

- Substantial: Only adverse effects are normally assigned this level of significance. These effects are generally, but not exclusively, associated with sites or features of international importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of national importance may also enter this category.
- Major: These beneficial or adverse effects are generally, but not exclusively, associated with sites or features of international or national importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of regional importance may also enter this category.
- Moderate: These may be beneficial or adverse effects, arising from a high level of impact on a less sensitive site or a lower magnitude of impact on a more sensitive site. The cumulative effects of such factors may lead to an increase in the overall effect on a particular resource or receptor.
- Minor: These beneficial or adverse effects are often localised but may be important in enhancing the subsequent design of the Project.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

9.5. Assumptions and Limitations of the Assessment

9.5.1 A request for data to inform the ecological desk study was sent to Surrey Biodiversity Records Centre but by the date of drafting this chapter (summer 2021) no data had been received. Therefore, this assessment relies on data provided during a previous desk study undertaken in 2016. It is considered unlikely that the distribution of non-statutory designated sites and protected and notable species records would have changed significantly but new data may be available. As such, all desk-based work, including requests for current data from local records centres etc., will be confirmed and updated if required for the ES.

9.5.2 There have also been minor limitations in data collection during protected species surveys due to land access restrictions and issues with data collection relating to equipment and its operation. This has resulted in some survey visits being undertaken during less optimal periods or data not

being collected. However, this accounts for a small proportion of the total data collected and is either sufficiently covered by the data available or would be remedied during the EIA process for inclusion in the ES. Full details of survey limitations are included in Appendix 9.6.2: Ecology Survey Report.

- 9.5.3 No assumptions or limitations have been identified in the preparation of this chapter that would prevent a preliminary assessment of the potential effects being made.

9.6. Baseline Environment Conditions

- 9.6.1 An ecological desk study, Phase 1 habitat survey and a number of terrestrial and aquatic surveys were undertaken during the period 2019 to 2021 to establish ecological baseline conditions and are summarised in this part of the chapter. The full results are provided in Appendix 9.6.2: Ecology Survey Report.

Statutory and Non-statutory Designated Sites

- 9.6.2 There are 17 statutory designated sites located within the search area. Their locations are shown on Figure 9.6.1. These include three internationally designated sites within 20 km of the Project site boundary which are listed below:

- Mole Gap to Reigate Escarpment SAC: located 9.2 km to the north west of the Project site boundary;
- Ashdown Forest SAC: located 12 km to the south west of the Project site boundary; and
- Ashdown Forest SPA: located 12 km to the south west of the Project site boundary.

- 9.6.3 In addition, following consultation with Natural England, the following European sites designated for their bat populations beyond 20 km from the Project site boundary have been identified for consideration:

- Ebernoe Common SAC located 29 km to the south west of the site; and
- The Mens SAC located 25 km to the south west of the site.

- 9.6.4 In addition, following further consultation with Natural England with respect to the potential impacts of changes in air quality from vehicle emissions on major roads, the following sites have also been included:

- Thames Basin Heaths SPA located 23.6 km to the north west of the site; and
- Thursley, Ash, Pirbright and Chobham SAC located 33.8 km to the north west of the site

- 9.6.5 The remaining 14 nationally designated sites within 5 km of the Project site boundary are:

- Willoughby Fields Local Nature Reserve (LNR): located 786 metres to the south of the site;
- Grattons Park LNR: located 1.25 km to the south of the site;
- Edolph's Copse LNR: located 1.54 km to the west of the site;
- Glover's Wood SSSI: located 1.62 km to the west of the site;
- Waterlea Meadow LNR: located 3.49 km to the south of the site;
- Worth Way Country Park (CP): located 3.7 km to the south east of the site;
- Tilgate Forest LNR located 4.19 km to the south of the site;
- House Copse SSSI: located 4.34 km to the south west of the site;
- Hedgecourt SSSI: located 4.62 km to the east of the site;

- Buchan Hill Ponds SSSI: located 4.93 km to the south of the site;
- Tilgate Park CP: located 4.9 km to the south of the site;
- Target Hill Park: LNR located 4.9 km to the south of the site;
- Buchan CP: located 4.9 km to the south of the site; and
- Broadfield Park LNR: located 5.06 km to the south of the site.

9.6.6 There are no statutory designated sites within the Project site boundary, with the nearest being Willoughby Fields Local Nature Reserve (LNR), located approximately 786 metres to the south of the site.

9.6.7 A total of 21 non-statutory designated sites were identified within 5 km of the Project site boundary through the 2019 desk study. A further 12 were identified within Surrey from the 2016 desk study. Horleyland Wood Local Wildlife Site (LWS), comprised of woodland, is located within the Project site boundary. A list of all 21 sites and their distance to the Project site boundary is provided in Table 9.6.1 below and shown on Figure 9.6.2.

Table 9.6.1: Non-Statutory Sites within 5 km of the Project Site

Site Name	Type	Distance from Site (m)
Horleyland Wood	LWS	Within Project site boundary
Rowley Wood	LWS	691
Willoughby Fields	LWS	752
Grattons Pond	LWS	1,224
Wood near Lower Prestwood Farm	LWS	1,298
A264 Copthorne	DRV	1,643
Ifield Brook Wood and Meadows	LWS	1,671
Copthorne Common	LWS	2,157
Ewhurst Wood	LWS	2,170
Orltons Copse	LWS	2,216
Worth Way	LWS	3,726
Ifield Pond and surroundings	LWS	3,130
The Hawth	LWS	3,432
Worth Meadows	LWS	3,517
Hyde Hill	LWS	3,533
Oaken Wood, Stony Plats & High Lines	LWS	3,591
Woldhurstlea Wood	LWS	3,717
Tilgate Park	LWS	4,899
Lobbs Wood & Furnace Pond	LWS	4,690
Kilnwood Copse	LWS	4,924
Buchan Country Park	LWS	4,923
<i>The Roughs</i>	<i>SNCI</i>	<i>82</i>
<i>Withy Gill</i>	<i>SNCI</i>	<i>172</i>
<i>Dukes copse</i>	<i>SNCI</i>	<i>4,370</i>
<i>Leg of Mutton Wood, The Jordans and Jordans Wood</i>	<i>SNCI</i>	<i>3,363</i>
<i>Brook Wood</i>	<i>SNCI</i>	<i>1,791</i>

Site Name	Type	Distance from Site (m)
<i>Bridgeham Wood</i>	<i>SNCI</i>	<i>1,030</i>
<i>Acorn Wood, Cidermill and The Birches</i>	<i>SNCI</i>	<i>3,210</i>
<i>Wheatfield Marsh</i>	<i>SNCI</i>	<i>1,671</i>
<i>Copper Coin Pond</i>	<i>SNCI</i>	<i>1,422</i>
<i>Copper Coin Paddocks</i>	<i>SNCI</i>	<i>1,399</i>
<i>Charlwood Stanhill Court Meadow</i>	<i>SNCI</i>	<i>2,054</i>
<i>Langshott Wood</i>	<i>SNCI</i>	<i>1,722</i>

Abbreviations used in Table 9.6.1: LWS: Local Wildlife Site; DRV: Designated Road Verge; SNCI: Site of Nature Conservation Interest. Records in italic were provided by Surrey Biodiversity Information Centre in 2016 and so may not be current.

9.6.8 Gatwick Woods Biodiversity Opportunity Area (BOA) is located partially within the Project boundary to the east of the airport. Details of further BOAs within the study area have been requested but not received. They will be included in the ES, if available.

Habitats

9.6.9 The findings of the Phase 1 habitat survey are summarised below and set out in more detail in Appendix 9.6.2: Ecology Survey Report, including a detailed Phase 1 habitat plan. Figure 9.6.3 identifies the key habitat types present. Where key areas have been given a target note (TN), these have been referenced within the text below. A full list of target notes can be found within Appendix 9.6.2, Annex 3, Table A3.4.

9.6.10 At the time of survey, the majority of the Project site comprised habitats associated with the airport including amenity grassland, areas of tarmacked hard standing and an array of buildings associated with the wider airport.

9.6.11 Areas around the periphery of the airport were identified as more natural and included areas of broadleaved woodland and neutral grasslands.

9.6.12 The Project site includes two areas managed by GAL as part of their Biodiversity Action Plan (BAP). These are described below.

- The North West Zone (NWZ) made up of the river corridor of the River Mole comprising the stream, neutral grasslands and broadleaved woodland.
- The Land East of the Railway Line (LERL) made up of broadleaved woodland, neutral grassland (including a flood storage area) and the Gatwick Stream.

9.6.13 The locations of the BAP areas and other areas around the periphery of the Project site are shown on Figure 4.2.1c along with the names used to describe them within this chapter.

Semi-natural Broadleaved Woodland

9.6.14 Habitats within the Project site boundary include semi-natural broadleaved woodland located mainly within the LERL site, along the western side of the River Mole corridor (NWZ), Brockley Wood (TN7), Crawler's Wood (TN13), and the southern boundary.

9.6.15 Brockley Wood and Horleyland Wood (TN3) are both designated as ancient woodland. A portion of Lower Picketts Wood (TN4) and woodland along the north west side of the River Mole are also ancient woodland.

Broadleaved Plantation Woodland

- 9.6.16 Broadleaved plantation woodland is associated with highway planting along the embankments of the M23 spur road, around the south west corner of Pentagon Field, new planting within the LERL biodiversity area (TN6 a,b,c) and along the western edge of London Road.

Mixed Plantation Woodland

- 9.6.17 Within the northern part of the airfield, a large bank has been planted with a mix of broadleaved and coniferous trees.

Dense/Continuous Scrub

- 9.6.18 Dense and continuous scrub is present along the M23 spur road embankments, along the southern boundary of the LERL biodiversity area, and in a large area on the western flank of Brockley Wood.

Scattered Scrub

- 9.6.19 Scattered scrub was identified within the south west corner of Museum Field, scattered through the marshy grassland and around the base of the large earth bank south west of Brockley Wood (TN8).

Scattered Broadleaved Trees

- 9.6.20 Scattered broadleaved trees are present throughout the Project site, especially within the car parks (Long Stay South, Long Stay North, Car Park X), within Pentagon Field (TN1), the LERL biodiversity area and around Museum Field where they include individual trees and trees planted in groups or lines. Along existing roadsides, individual trees forming lines of trees comprising both mature and semi-mature trees were identified.

Mixed Scattered Trees

- 9.6.21 Within Longbridge roundabout, a mix of semi-mature broadleaved and coniferous trees have been planted. Tree species include oak, silver birch and leylandii.
- 9.6.22 Around the north west corner of the roundabout, south east of Holiday Inn, coniferous trees line the eastern side of the amenity grassland, west of the pavement. A single example of a leylandii, a sycamore and a cherry were present within the line of conifers.

Neutral Semi-improved Grassland

- 9.6.23 The main areas of neutral semi-improved grassland were identified in the south of the Project site within the fields south of Upper Picketts Wood, in the east within Pentagon Field and south of the M23 spur road, along the River Mole corridor (NWZ) and to the east of the Fire Training Ground.

Improved Grassland

- 9.6.24 The grassland areas around Museum Field were identified as being heavily managed improved grassland fields. The field north of the M23 spur-Airport Way roundabout and the fields south of the M23 spur were also noted as being managed improved grassland paddocks.

Marshy Grassland

- 9.6.25 Marshy grassland was recorded in the south east of the site within the LERL south of Crawley Sewage Treatment Works, south west of Museum Field, in the two fields south of Brockley Wood and south west of the new Boeing hangar and in areas along the River Mole corridor (NWZ) (TN10 a, b and c).

Poor Semi-improved Grassland

- 9.6.26 Around Pond E, the grassland is less managed but did not have a diverse species range. Along the north western border of the Pentagon Field there is a strip of poor-semi improved grassland.

Tall Ruderal

- 9.6.27 A large area of tall ruderal vegetation is located to the east of the Gatwick Stream, south of the Crawley Sewage Treatment Works.

Marginal Vegetation

- 9.6.28 Marginal vegetation was identified along the banks of the River Mole.

Swamp

- 9.6.29 The area immediately surrounding Pond E11 is dominated by bulrushes creating a swamp habitat.

Standing Water

- 9.6.30 At the time of survey, standing water was evident as a number of ponds, lagoons and ditches. These habitats are located within all areas of the Project site boundary.

Running Water

- 9.6.31 The River Mole, Crawters Brook and Gatwick Stream are the largest linear sections of running water through the Project site boundary.

Amenity Grassland

- 9.6.32 Managed and mown amenity grassland is located around the runways and taxiways, the new and old lagoons and various ponds (as described within Appendix 9.6.2, Annex 3, Table A3.1), and around the roundabouts and roadside verges.

Introduced Shrub

- 9.6.33 Planted beds of introduced shrub are present throughout the car parks and at the entrances to the airport.

Species-rich Hedgerow

- 9.6.34 A species-rich hedge was identified along the western boundary of the Museum Field. Further species-rich hedgerows are located around the Pentagon Field.

Species-poor Hedgerow

- 9.6.35 The majority of hedgerows around Museum Field are species-poor hedgerows.

Species-poor Hedgerow with Trees

- 9.6.36 A species-poor hedge with trees was located along a footpath, north of the M23 spur road.

Fences

- 9.6.37 Large security fences surround the whole of the airport. Metal security fencing is also present around Crawley Sewage Treatment Works and all car parks. Wooden and wire and picket fencing was also identified through the woodland in the south east of the site.

Dry Ditches

- 9.6.38 Within the car parks in the north and south and through the fields south of the M23 spur road, a number of drainage ditches were identified, which were dry at the time of surveys.

Earth Banks

- 9.6.39 A number of earth banks are present, including a large one to the east of the River Mole and south of Brockley Wood (TN11). An earth noise bund is located along the western boundary of the airfield. Within the biodiversity fields, several low earth banks were identified. A large earth bank is present in the east of the south long stay car park.

Buildings

- 9.6.40 Apart from the buildings associated with the terminals, hangars and maintenance buildings within the airport, there was a variety of buildings with a mix of uses around the north, east and south of the airport.

Bare Ground

- 9.6.41 Bare ground was associated with the car park for the biodiversity areas south east of the London to Brighton railway (within the LERL).

Hardstanding

- 9.6.42 The majority of the areas of hardstanding comprise the operational airport's runways, aprons and taxiways, car parks in the northern part of the site and to the east of the railway and roads.

Species

- 9.6.43 The findings of the surveys that have been undertaken for protected and notable species are summarised below and reported in full in Appendix 9.6.2.

Plants

- 9.6.44 The WCA 1981 (as amended) lists protected plant species under Schedule 8. Two plant species listed on Schedule 8 were recorded within the Project site boundary: Bluebell *Hyacinthoides non-scripta* and pennyroyal *Mentha pulegium*.
- 9.6.45 The WCA 1981 (as amended) lists non-native invasive plant species under Schedule 9. One plant species listed on Schedule 9 was recorded within the Project site boundary: Himalayan balsam *Impatiens glandulifera*.

Wintering Birds

9.6.46 A total of 61 species were recorded within the survey boundary during the wintering bird survey between October 2018 and March 2019. Those of conservation interest are listed in Table 9.6.2 below.

Table 9.6.2: Conservation Status of Birds Recorded within Project Site (October 2018 - March 2019)

Species	Annex 1 EU Birds Directive	UK BAP Priority Species	NERC Species of Principal Importance	Birds of Conservation Concern
Bullfinch		•	•	Amber
Black-headed gull				Amber
Common gull				Amber
Dunnock		•	•	Amber
Fieldfare				Red
Green sandpiper				Amber
Greylag goose				Amber
Grey wagtail				Red
Herring gull		•	•	Amber
House sparrow		•	•	Red
Kestrel				Amber
Lapwing		•	•	Red
Lesser black-backed gull				Amber
Mallard				Amber
Marsh tit		•	•	Red
Mistle thrush				Red
Meadow pipit				Amber
Red kite	•			N/A
Redwing				Red
Skylark		•	•	Red
Snipe				Amber
Song thrush		•	•	Red
Starling		•	•	Red
Woodcock				Red

9.6.47 There were no wintering species recorded in any numbers which were considered to be of national or international significance. Of the 61 species recorded, the Project site was considered to be of site-level importance for lapwing, these were recorded predominantly around the Crawley Sewage Treatment Works.

9.6.48 The wintering bird population within the Project site is considered as being of no more than local importance.

Breeding Birds

- 9.6.49 The desk study search returned records for 45 species of notable and / or protected birds within 2 km of the Project site boundary.
- 9.6.50 The management techniques on land around Gatwick follow the guidance provided in CAP 772 Wildlife Hazard Management at Aerodromes (CAA, 2017) which may result in a lower baseline of recorded numbers of certain bird species and reduced counts of specific species during the breeding bird surveys than would be recorded if the management was not in place.
- 9.6.51 A total of 72 species were recorded during the survey of breeding birds within the Project site boundary and surrounding study area, of which 48 were confirmed to be breeding and three possibly breeding (peregrine, little ringed plover and firecrest), resulting in a breeding assemblage of 51 species.
- 9.6.52 All species of wild bird in the UK (other than a few pest species) are given general protection under Part 1 Section 1(1) of the WCA 1981 and birds listed under Schedule 1 of the Act are further protected.
- 9.6.53 Species listed on the Section 41 list of Species of Principal Importance of the NERC Act 2006, species included in BoCC Red and Amber Lists (Eaton *et al.*, 2015) and species occurring in nationally, regionally or locally important numbers are also considered.
- 9.6.54 Of the 51 species recorded as breeding or possibly breeding within the survey area, 17 species meet at least one of the above criteria relating to special statutory protection or conservation importance and are listed in Table 9.6.3 below.

Table 9.6.3: Birds of Conservation Interest Confirmed as Breeding/Possibly Breeding within the Project Site and Surrounding Area

Species	Breeding status	No. of territories	Annex 1 EU Birds Directive	Schedule 1 WCA	NERC Species of Principal Importance	BoCC 4 Red and Amber species
Peregrine	Possible	1	■	■	-	-
Little ringed plover	Possible	1	-	■	-	-
Firecrest	Possible	1	-	■		-
Skylark	Confirmed	12	-	-	■	Red
Song thrush	Confirmed	19	-	-	■	Red
Marsh tit	Confirmed	1	-	-	■	Red
Starling	Confirmed	2	-	-	■	Red
House sparrow	Confirmed	4	-	-	■	Red
Linnet	Confirmed	1	-	-	■	Red
Grey wagtail	Confirmed	1	-	-	-	Red

Species	Breeding status	No. of territories	Annex 1 EU Birds Directive	Schedule 1 WCA	NERC Species of Principal Importance	BoCC 4 Red and Amber species
Mistle thrush	Confirmed	2	-	-	-	Red
Mallard	Confirmed	9	-	-	-	Amber
Kestrel	Confirmed	4	-	-	-	Amber
Stock dove	Confirmed	3	-	-	-	Amber
Dunnock	Confirmed	18	-	-	■	Amber
Bullfinch	Confirmed	1	-	-	■	Amber
Reed bunting	Confirmed	2	-	-	■	Amber

- 9.6.55 Three species (little ringed plover, peregrine and firecrest) were recorded within the Project site boundary and could possibly have bred. All three are listed under Schedule 1 of the WCA 1981.
- 9.6.56 Little ringed plover - one adult was recorded on visit five flying over the main lagoon east of Crawley Sewage Treatment Works in an area not accessible during the survey; it is possible birds may have been present on previous surveys and not detected.
- 9.6.57 Peregrine - one male was recorded on visit three on top of Pier 3, just north of the South Terminal building. As there was only one observation recorded, and due to access restrictions around airport buildings and high noise levels (which restricted the possibilities of detecting adults), it was not possible to confirm signs of breeding during the surveys.
- 9.6.58 Firecrest - single singing males were recorded at the eastern fringe of Horleyland Wood on visit two and in Upper Pickett's Wood on visit three. These observations could relate to territorial males that failed to find a mate or passage migrants as there were no further records beyond late April.
- 9.6.59 Nine species, confirmed as breeding within the survey area (skylark, dunnock, song thrush, marsh tit, starling, house sparrow, linnet, bullfinch and reed bunting) are listed in Section 41 of the NERC Act 2006 as being of principal importance for the conservation of biodiversity in England.
- 9.6.60 Eight species confirmed breeding within the survey area are included on the BoCC Red list (startling, marsh tit, skylark, song thrush, mistle thrush, house sparrow, grey wagtail and linnet).
- 9.6.61 Six species recorded during the survey are included on the BoCC Amber List (mallard, stock dove, kestrel, dunnock, bullfinch and reed bunting).
- 9.6.62 No breeding population of any species within the survey area approaches the 1% level of the national population. Therefore, no species considered to be breeding or possibly breeding are present in nationally important numbers.
- 9.6.63 The geographical importance of the breeding populations of species of conservation interest is local for all species except little ringed plover, marsh tit and firecrest, which are of county interest and peregrine, which is of regional interest. The diversity of species present within the survey area is at a level indicative of County importance for breeding birds.

Reptiles

- 9.6.64 The Project site offers a number of suitable habitats for reptiles, including wet and marshy areas, dense and scattered scrub, taller areas of grassland and earth banks.
- 9.6.65 Grass snakes were recorded within the Project site boundary in two distinct areas, along the River Mole corridor (NWZ) and within the grassland areas of the LERL. Juvenile grass snakes were recorded in both areas meaning that the two distinct populations are viable.
- 9.6.66 Grass snake is partially protected under Schedule 5 of the WCA 1981(as amended) and also listed under Section 41 of the NERC Act (2006).
- 9.6.67 No other reptiles were recorded during the 2019 reptile surveys.

Amphibians

- 9.6.68 A number of ponds and linear water features were identified during the Phase 1 habitat survey as being suitable to support all species of native amphibian.
- 9.6.69 A previous GCN survey (Wadsworth, 2016) in relation to the creation of the New Lagoon identified GCN as being present in Ponds; 8N8, W46 and 1WH.
- 9.6.70 GCN were recorded within four ponds within the Project site boundary. Two of the ponds were located in the woodland in the south east of the Project site. During the 2019 survey season one pond dried up, meaning not all surveys could be completed. No GCN were recorded whilst water was present in that pond.
- 9.6.71 The other two ponds were located west of the River Mole, within the grounds of the Bear and Bunny nursery.
- 9.6.72 Using the GCN Population Size Class assessment (Froglife, 2001) the maximum GCN count on one night using one survey method for each pond was zero, 13, eight and ten for the four ponds.
- 9.6.73 This equates to a medium GCN population size for one pond and small GCN population sizes for the remaining three ponds.
- 9.6.74 Although no GCN were recorded within one of the ponds, the eDNA survey result was positive and a single GCN egg was identified in the pond confirming that they were present, but likely to be in low numbers.
- 9.6.75 Smooth newts were recorded in nine ponds. Palmate Newt was recorded in four ponds. Small newts that could not be identified as either smooth newt or palmate newt were recorded within three ponds.
- 9.6.76 Common toad was recorded in one pond and along the northern edge of the field south of Brockley Wood.
- 9.6.77 Common frogs were recorded throughout the Project site. One edible frog was recorded within Pond TTD. These are not further considered within the assessment due to not being of conservation concern either because they are common and widespread in the UK or because they are a non-native species.

- 9.6.78 GCN is a European protected species and fully protected under Schedule 5 of the WCA 1981 (as amended). All other native amphibians are partially protected, under Schedule 5 of the WCA 1981 (as amended) prohibiting their sale. Common toad is also listed under Section 41 of the NERC Act (2006).

Badgers

- 9.6.79 Badgers and their setts are protected under the Protection of Badgers Act 1992.
- 9.6.80 Signs of badger activity were recorded during badger surveys. Due to the sensitive nature of badger data, the full findings of the surveys are reported in a confidential appendix (Appendix 9.6.4) which is available upon request to those with a legitimate need for the information.

Hazel Dormouse

- 9.6.81 The desk study provided records of dormice within the Project site boundary from 2016. However, in the 2019 surveys no dormice were identified along the River Mole corridor (NWZ), through Brockley Wood, Horleyland Wood, Upper Picketts Wood, Crawter's Wood or Riverside Garden Park.
- 9.6.82 Hazel dormouse is protected under Schedule 5 of the WCA Act 1981 (as amended).
- 9.6.83 After a season's survey, no dormice were recorded within the Project site boundary. Due to dormice living at such low densities, a further season of surveys will be undertaken to confirm absence pre commencement.

Otter

- 9.6.84 Signs of otters were not identified within the Project site boundary, during surveys. Otters are known to occur along watercourses within the wider area and due to their large territories, there is potential for them to utilise the habitats within the Project site boundary.
- 9.6.85 Otter is a European protected species and is protected under Schedule 5 of WCA 1981 (as amended).

Water Vole

- 9.6.86 No records of water voles were provided in the desk study and no signs of water vole were recorded within the Project site boundary.
- 9.6.87 Water voles are fully protected under Schedule 5 of the WCA 1981 (as amended).

Bats

- 9.6.88 The desk study provided records for at least fourteen bat species within and immediately adjacent to the Project site boundary, including records for Bechstein's bat, alcathe bat and barbastelle bat.

Buildings

- 9.6.89 An assessment of the suitability of buildings for bat roosting potential, within the landside and airside areas of the Project site boundary, was undertaken at the time of the Phase 1 habitat survey.

9.6.90 Two buildings within the Project site boundary were identified as having suitable features present to support roosting bats: one, the Old Control Tower located in the north west of the Project site boundary (landside), adjacent to Control Tower Road and east of the River Mole; and the second, a disused ancillary building located along the southern boundary of the airside perimeter fencing, adjacent to Crawter's Brook and Staff Car Park Z.

9.6.91 A total of three emergence and/or dawn re-entry surveys were undertaken on each of the two buildings described above. No bats were recorded emerging from either building, and bat activity was generally very low across the site during the emergence surveys.

Activity Transects

9.6.92 Bat activity transects were also undertaken across the Project site between April and October 2019 and between August and October 2020.

9.6.93 A total of five transect routes were devised in 2019 to cover a broad range of habitat types present on site but focusing on those likely to be of greatest value to bats, including woodland, woodland edges, river corridors and open grassland. A further three routes were partially completed in 2020 covering areas of the site not surveyed previously. The remaining surveys will be completed in 2021.

9.6.94 At least six bat species were recorded across the survey area, including passes made by Leisler's bat, Nathusius' pipistrelle and *Myotis* bats. The *Myotis* bats could include rarer species.

9.6.95 Confirmed bat species recorded within the bat activity surveys included:

- common pipistrelle;
- soprano pipistrelle;
- Nathusius' pipistrelle;
- noctule;
- Leisler's bat; and
- serotine bat.

9.6.96 A number of calls of bats were not able to be identified to species level, these included bats from the long-eared group of bats (brown long-eared and grey long-eared) and bats from the *Myotis* group of bats (alcatheo bat, Bechstein's bat, Brandt's bat, Daubenton's bat, Natterer's bat and whiskered bat) were also recorded.

9.6.97 Some of these calls were more characteristic of a particular bat species including:

- Brandt's bat;
- Daubenton's bat;
- Natterer's bat; and
- whiskered bat.

9.6.98 Higher value foraging and commuting habitat was identified within the woodland areas in the east of the Project site, along woodland edges, river corridors and mature hedgerows and treelines.

9.6.99 The highest levels of bat activity were recorded throughout Horleyland Wood, around the eastern part of the LERL fields and along the Gatwick Stream and southern boundary of the LERL fields east of the railway.

- 9.6.100 Within Riverside Garden Park but outside of the Project site boundary, high levels of bat activity were recorded along the Gatwick Stream, around the lake and along the north west edge of the park, towards Longbridge roundabout.
- 9.6.101 In the west of the site the highest levels of activity were recorded along the woodland belt, west of the River Mole. Foraging and commuting activity was picked up within the wider fields east of the Gatwick Aviation Museum, predominantly this activity was associated with the field boundary hedgerows and mature tree lines.
- 9.6.102 Relatively little bat activity was picked up along the southern Project site boundary during the bat transects, compared with the other transect routes.
- 9.6.103 Overall, the continuity of connective habitat is likely to provide an extensive network of habitat features suitable for a wide range of commuting, foraging and roosting bats, providing links to the wider landscape in this area.

Static/Automated Surveys

- 9.6.104 A total of 11 static detector units were deployed across the survey area between April and October 2019 for a minimum of five nights per location per month. The units were positioned at various locations, in order to sample a broad range of the habitat types present on site but focusing on those likely to be of greatest value to bats. The static detector locations are shown in Appendix 9.6.2. The detectors were set out to record the same nights in each location, though equipment difficulties occasionally resulted in inconsistencies between nights and some missing recordings, as detailed within Appendix 9.6.2.
- 9.6.105 The static detectors were located at:
- land west of the Fire Training Ground (Location 1);
 - land south west of the River Mole (Location 2);
 - Brockley Wood (Location 3);
 - north of Long Stay North car park (Location 4);
 - Riverside Garden Park (Location 5);
 - land west of the railway (Location 6);
 - Horleyland Wood (Location 7);
 - LERL wetland (Location 8);
 - Perimeter Road South (Location 9);
 - land west of Car Park X (Location 10); and
 - Crawter's Wood (Location 11).
- 9.6.106 Additional detectors were located along the transects in 2020 at:
- River Mole south of Brockley Wood (Location 12);
 - Riverside Garden Park (Location 13); and
 - Land north of A23 (Location 14).
- 9.6.107 At least nine bat species were recorded across the survey area, including passes made by barbastelle bat, Leisler's bat and Nathusius' pipistrelle.

Trapping Surveys

9.6.108 A total of 154 bats of nine species were captured over nine trapping nights between 28 May and 4 September 2019 in 20 different locations.

9.6.109 Bat species caught during the trapping surveys included:

- Bechstein's bat;
- Brandt's bat;
- Daubenton's bat;
- whiskered bat;
- whiskered/Brandt's bat;
- Natterer's bat;
- brown long-eared bat;
- common pipistrelle; and
- soprano pipistrelle.

DNA Analysis

9.6.110 Droppings were obtained from nine of the trapped small *Myotis* bats, which were all sent for DNA analysis. Eight of these samples were successfully analysed to species level, which confirmed the bats as being whiskered bats.

Radio-tracking Surveys

9.6.111 Twenty of the trapped bats were selected for radio-tracking. The species, sex, breeding status and bat identification numbers are shown in Table 9.6.4 below.

Table 9.6.4: The species, sex, breeding status and month of capture of bats tagged and radio tracked within the Project site and surrounding area in 2019.

Bat identification number	Trapping location	Trapping location ref.	Species	Sex	Breeding status	Month of capture
1	Crawter's Wood	3c	Brown long-eared bat	Female	Pregnant	May
2	Crawter's Wood	3c	Brandt's bat	Female	Pregnant	May
3	Crawter's Wood	3c	Bechstein's bat	Male	N/A	May
4	Crawter's Wood	3b	Whiskered bat	Female	Pregnant	May
5	Lower Picketts Wood	6a	Daubenton's bat	Female	Pregnant	May
6	Crawter's Wood	3a	Brown long-eared bat	Female	Lactating	July
7	Crawter's Wood	3b	Natterer's bat	Female	Lactating	July
8	Eastern boundary of Museum Field	1a	Bechstein's bat	Male	N/A	July
9	Horleyland Wood	5d	Bechstein's bat	Male	N/A	July

Bat identification number	Trapping location	Trapping location ref.	Species	Sex	Breeding status	Month of capture
10	Riverside Garden Park	4c	Bechstein's bat	Male	N/A	July
11	Horleyland Wood	5d	Daubenton's bat	Female	Lactating	July
12	Upper Picketts Wood	7a	Brown long-eared bat	Female	Lactating	July
13	Brockley Wood	2c	Brown long-eared bat	Female	Non-parous	September
14	Eastern boundary of Museum Field	1b	Bechstein's bat	Female	Juvenile (non-parous)	September
15	Eastern boundary of Museum Field	1a	Brown long-eared bat	Female	Juvenile (non-parous)	September
16	Crawter's Wood	3c	Whiskered bat	Female	Young adult (non-parous)	September
17	Brockley Wood	2a	Bechstein's bat	Male	Juvenile	September
18	Eastern boundary of Museum Field	1b	Bechstein's bat	Female	Non-parous	September
19	Riverside Garden Park	4c	Brown long-eared bat	Female	Post-lactating	September
20	Horleyland Wood	5e	Daubenton's bat	Female	Post-lactating	September

9.6.112 A total of ten confirmed roosting locations were identified from nine radio-tagged bats of five species. Additionally, eight estimated roosting locations were identified. Dusk emergence surveys were undertaken on eight of the confirmed roosts. The location of these roosts and counts of the roosts are provided in Appendix 9.6.3 and described below:

- woodland strip to the west of Brockley Wood (Bechstein's bat);
- to the east of the M23 (Daubenton's bat); and
- Upper Pickett's Wood (Daubenton's bat).

9.6.113 Key flightlines were identified for seven of the radio-tagged bats, which included four Bechstein's, one brown long-eared bat and two Daubenton's bat.

9.6.114 Bechstein's bats were recorded using various sections of the River Mole to commute between foraging areas, including the area of the River Mole to the west of Brockley Wood, the area south of Povey Cross Road and the area to the north of Brockley Wood. Flightlines for Bechstein's bats were also recorded along Man's Brook, to the south of Burlands Farm.

- 9.6.115 Flightlines were identified for one of the radio-tracked brown long-eared bats which was recorded using Man's Brook to the south of Burlands Farm.
- 9.6.116 Flightlines were identified for two Daubenton's bats; one from the roost location south along Burstow Stream to a large waterbody; and the second was identified from its roosting location in Upper Pickett's Wood through the woodland to the sewage work lakes.
- 9.6.117 Core foraging areas for radio-tracked Bechstein's bats were identified within the following areas:
- Museum Field;
 - Charlwood Place Farm;
 - woodland strip to the west of Brockley Wood;
 - River Mole;
 - woodland to the east of Shangri-La and south of Brook Farm;
 - woodland strip to the south-west of the Project area, north of Charlwood Road;
 - Riverside Garden Park;
 - Upper Pickett's Wood; and
 - woodland to the north of Crawley Sewage Treatment Works.
- 9.6.118 Foraging areas for non-target bat species (Brandt's bat, brown long-eared bat, Daubenton's bat, Natterer's bat and whiskered bat) were identified in similar locations to Bechstein's bats including:
- Brockley Wood;
 - River Mole;
 - woodland strip to the west of Brockley Wood;
 - Upper Pickett's Wood
 - Man's Brook;
 - Lower Pickett's Wood;
 - woodland to the south of Shipley Bridge; and
 - hedgerows and woodlands to the south of Charlwood.
- 9.6.119 Full details of the roosting and foraging areas are discussed in Appendix 9.6.3.

Other Mammals

- 9.6.120 The desk study data showed that the west European hedgehog and harvest mice have been recorded within the Project site boundary.
- 9.6.121 Both are listed under Section 41 of the NERC Act (2006) and have suitable habitat through the Project site.

Terrestrial Invertebrate Assemblage

- 9.6.122 Several species designated under Section 41 of the NERC Act (2006) were identified by the desk study and the two biodiversity areas; the River Mole corridor (NWZ) and the area east of the railway (LERL), are recognised as being of raised invertebrate interest.
- 9.6.123 In 2019 an invertebrate habitat appraisal of areas outside of the biodiversity areas identified that the land south of the Aviation Museum and west of the Fire Training Ground, Museum Field and the land to the north and west of it, the artificial earth noise bund and Pentagon Field all had features of moderate invertebrate interest above the expected regional background level.

- 9.6.124 On-going monitoring by GAL of the NWZ and LERL biodiversity areas has identified a diverse assemblage of terrestrial invertebrates in these areas. Follow up detailed surveys in 2020 confirmed this, including a range of scarce and unusual species.

Aquatic Invertebrates

- 9.6.125 Several species designated under Section 41 of the NERC Act (2006) were identified by the desk study.
- 9.6.126 In 2019, the invertebrate habitat appraisal identified that Pond M and the ditches adjacent to Pentagon Field had features of moderate invertebrate interest above the expected regional background level.
- 9.6.127 Further detailed assessment of the River Mole and Gatwick Stream found both watercourses supported macroinvertebrate communities indicative of moderately polluted conditions, exacerbated by relatively low flow conditions and high levels of sedimentation. Dense macrophyte growth on the River Mole is contributing to acute reductions in dissolved oxygen which are impacting on the macroinvertebrate assemblage.
- 9.6.128 There is presence of one record from 2013 of shining ram's-horn snail, an IUCN Red List species and UK species of principal importance under the 2006 NERC Act. Although not recorded during the survey, there remains a possibility that the species may occur at the site of the 2013 record at the downstream end of the desk study area.
- 9.6.129 The Gatwick Stream appears to be impacted by both organic pollution and silt deposition, possibly from a storm water discharge outlet from a nearby industrial area.
- 9.6.130 The invasive New Zealand mud snail was identified at the River Mole and Gatwick Stream sites, and signal crayfish were observed at both the Gatwick Stream sites during each visit.

Fish

- 9.6.131 The desk study identified that brown trout had previously been recorded within the Project site boundary, although it was not recorded in surveys in 2020. Brown trout is listed under Section 41 of the NERC Act (2006).
- 9.6.132 Both the River Mole and Gatwick Stream had consistently high fish populations. This is likely to be a consequence of stable temperature and DO conditions caused by shading and potentially high abundances of pollution tolerant macroinvertebrates such as *Oligochaete* worms as a food source.

Summary of Nature Conservation Interest and Identification of Important Ecological Features (IEFs)

- 9.6.133 The majority of the Project site comprised common and widespread habitats that were not protected and no statutory designated sites were present within the site boundary. One non-statutory designated site, Horleyland Wood LWS was present within the Project site boundary. Areas of ancient woodland were also present in the east of the site; Horleyland Wood and woodland to the east of it; and Brockley Wood.
- 9.6.134 The Project site boundary also includes the following Habitats of Principal Importance which are recognised under section 41 of the NERC Act (2006), including hedgerows; woodland; rivers and

ponds (ponds where protected and notable species have been recorded). A total of two protected plants (bluebell and pennyroyal) were recorded within the Project site boundary and were associated with higher value habitats including ponds and woodland.

- 9.6.135 The areas of hardstanding, amenity grassland, poor semi-improved grassland, scrub and tall ruderal vegetation were not considered to be IEFs. The areas of hardstanding and amenity grassland were of no to very low ecological value and were not considered important habitats. The other habitats were either relatively young and did not display the characteristics of a more established habitat or had low species or structural diversity and were therefore not considered important habitats.
- 9.6.136 The site was found to support a variety of breeding birds and foraging and commuting bats utilising the various habitats present. Populations of GCN and grass snake were present.
- 9.6.137 Signs of otters were not identified within the Project site boundary during surveys, but they are known to occur along watercourses within the wider area and due to their large territories, there is potential for them to utilise the habitats within the Project site boundary.
- 9.6.138 A number of Species of Principal Importance under section 41 of the NERC Act (2006) were also found to be present during field surveys (common toad) and from the desk study. Records of harvest mouse and hedgehog were provided in the desk study from within the Project site boundary and they are therefore also considered in the assessment.
- 9.6.139 Dormice and water voles were not found to be present and are not therefore considered further in this assessment at this stage. In the event that survey effort or records identify their presence, these will be considered within the ES.
- 9.6.140 Additionally, data relating to bat trapping/radio tracking and thermal imaging collision risk surveys are being analysed and will be presented in the ES.
- 9.6.141 IEFs comprising designated sites, habitats and species that could be affected by the Project and which are of particular nature conservation interest or concern are identified in Table 9.6.5 below.

Table 9.6.5: Important Ecological Features

IEF	Value of IEF	Covering legislation and guidance
Designated Sites		
Ashdown Forest SPA and SAC	International	Conservation of Habitats and Species Regulations 2017, as amended
Mole Gap to Reigate Escarpment SAC	International	Conservation of Habitats and Species Regulations 2017, as amended
Thames Basin Heaths SPA	International	Conservation of Habitats and Species Regulations 2017, as amended
Thursley Ash, Pirbright & Chobham SAC	International	Conservation of Habitats and Species Regulations 2017, as amended
The Mens SAC	International	Conservation of Habitats and Species Regulations 2017, as amended

IEF	Value of IEF	Covering legislation and guidance
Ebernoe Common SAC	International	Conservation of Habitats and Species Regulations 2017, as amended
Glover's Wood SSSI	National	Wildlife & Countryside Act 1981 (and as amended). Supports NERC Act (2006) Section 41 Habitats of Principal Importance
House Copse SSSI	National	Wildlife & Countryside Act 1981 (and as amended). Supports ancient woodland and NERC Act (2006) Section 41 Habitats of Principal Importance
Hedgecourt SSSI	National	Wildlife & Countryside Act 1981 (and as amended). Supports NERC Act (2006) Section 41 Habitats of Principal Importance
Buchan Hill Ponds SSSI	National	Wildlife & Countryside Act 1981 (and as amended). Supports NERC Act (2006) Section 41 Habitats of Principal Importance
Willoughby Fields LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Grattons Park LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Edolph's Copse LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Waterlea Meadow LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Worth Way CP	County	Countryside Act 1968
Tilgate Forest LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Tilgate Park CP	County	Countryside Act 1968
Target Hill Park LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Buchan CP	County	Countryside Act 1968
Broadfield Park LNR	County	Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the NERC Act (2006)
Horleyland Wood LWS (LWS within Project site boundary)	County	Considered in local authority policies under the domestic planning regime with applications made to local authorities

IEF	Value of IEF	Covering legislation and guidance
LWS, SNCI and DRV outside of site boundary (x32)	County	Considered in local authority policies under the domestic planning regime with applications made to local authorities
Habitats		
Ancient woodland (Horleyland Wood, woodland north of River Mole, woodland to east and Brockley Wood)	Regional	Designated ancient woodland
Semi-natural broadleaved woodland and mature broadleaved trees	County	NERC Act (2006) Section 41 Habitats of Principal Importance
Hedgerows	County	NERC Act (2006) Section 41 Habitats of Principal Importance
Watercourses	County	NERC Act (2006) Section 41 Habitats of Principal Importance
Ponds (NERC S.41)	County	NERC Act (2006) Section 41 Habitats of Principal Importance
Ponds (non-NERC S.41)	Local	Not qualifying under NERC Act (2006) Section 41 but supporting high species diversity
Semi-improved neutral grassland (NVC MG9)	Local	Not qualifying under NERC Act (2006) Section 41 but supporting high species diversity
Marshy grassland	Local	Not qualifying under NERC Act (2006) Section 41 but supporting high species diversity
Broadleaved plantation woodland and associated scrub	Local	Not qualifying under NERC Act (2006) Section 41 but providing a habitat connection.
Species		
Flora: Bluebell and pennyroyal	Local	Listed under Schedule 8 of the Wildlife & Countryside Act 1981 (and as amended)
Flora: Lesser quaking grass, narrow-lipped helleborine, ragged robin and solomon's seal	Local	Listed under the Vascular Plant Red List Data for Great Britain – 2006 as Nationally Scarce or Nationally Threatened
Breeding birds (confirmed or possible) peregrine	Regional	Listed under Section 1 Schedule 1 of the Wildlife & Countryside Act 1981 (and as amended)
Breeding bird assemblage including species of conservation interest (confirmed or possible); mallard, kestrel, stock dove, skylark, grey wagtail, dunnock, song thrush, mistle thrush, marsh	County	Listed under Section 1 of the Wildlife & Countryside Act 1981 (and as amended) and some NERC Act (2006) Section 41 Species of Principal Importance and BoCC Red or Amber listed species

IEF	Value of IEF	Covering legislation and guidance
tit, starling, house sparrow, linnnet, bullfinch and reed bunting		
Wintering birds	Local	No species recorded in numbers of national or international significance. NERC Act (2006) Section 41 Species of Principal Importance and BoCC Red or Amber listed species.
Grass snake	Local	Listed under Schedule 5 of the Wildlife & Countryside Act 1981 (and as amended) and NERC Act (2006) Species of Principal Importance
Great crested newt	Local	GCN are protected through inclusion in the Habitats Regulations. They are an EPS and as such any development works which could affect an EPS may require a licence from Natural England to comply with the Habitats Regulations. They are also NERC Act (2006) Section 41 Species of Principal Importance
Common toad	Local	NERC Act (2006) Section 41 Species of Principal Importance
Badger	Local	Badgers are protected under the Protection of Badgers Act 1992.
Otter	County	Otters are protected through inclusion in the Habitats Regulations. They are an EPS and as such any development works which could affect an EPS may require a licence from Natural England to comply with the Habitats Regulations. They are also NERC Act (2006) Section 41 Species of Principal Importance
Bats: Bechstein's bat and barbastelle bat	County	All bat species are protected through inclusion in the Habitats Regulations. They are an EPS and as such any development works which could affect an EPS may require a licence from Natural England to comply with the Habitats Regulations. Barbastelle, Bechstein's, noctule, soprano pipistrelle and brown long-eared bats are NERC Act (2006) Section 41 Species of Principal Importance. Bechstein's bat and barbastelle are Rare in the UK and the distribution of alcatheo is unknown.
Assemblage of other bat species	Local	
Dormouse	Local	Otters are protected through inclusion in the Habitats Regulations. They are an EPS and as such any development works which could affect an EPS may require a licence from Natural England to comply with the Habitats Regulations. They are also NERC Act (2006) Section 41 Species of Principal Importance.
Harvest mouse	Local	NERC Act (2006) Section 41 Species of Principal Importance

IEF	Value of IEF	Covering legislation and guidance
Hedgehog	Local	NERC Act (2006) Section 41 Species of Principal Importance
Fish	Local	Good species assemblage
Shining ramshorn snail	Local	IUCN Red List, NERC Act (2006) Section 41 Species of Principal Importance
Terrestrial invertebrate assemblage	County	Diverse assemblage including scarce and rare species

Future Baseline Conditions

9.6.142 The EIA Regulations require consideration of the likely changes to baseline conditions over time, taking into consideration the future development at Gatwick Airport without the Project. Therefore, an assessment of the future baseline conditions has been carried out and where relevant, have been factored into the assessment below.

Future Development Proposals

9.6.143 Improvements outside of the scope of the Project that have either already been consented or are committed (and do not require consent), including works being undertaken by other parties, considered within this section are:

- extension to Pier 6, including alternations to Taxiway Quebec and reconfiguration of aircraft stands;
- normal or planned maintenance and asset replacement programme for the main runway, including resurfacing of the main runway and replacement of the Instrument Landing System (ILS) localisers in accordance with the usual maintenance schedule;
- multi-storey car park 4 (1,500 vehicles);
- multi-storey car park 7 (2,750 vehicles);
- use of robotics technology within existing long stay parking areas to increase capacity, resulting in an additional 2,500 spaces;
- highway improvements to North Terminal and South Terminal roundabouts, signalisation and signage;
- extension to the existing BLOC hotel (approximately 200 additional bedrooms);
- reconfiguration of the existing Hilton hotel to provide 50 additional bedrooms; and
- Gatwick Station improvements.

Climate Change

9.6.144 The UK Climate Projections 2018 (Met Office, 2019) have stated that by 2070, in a high emissions scenario, the UK average temperature is expected to rise between 0.9 C-5.4°C in the summer and 0.7°C -4.2°C in winter.

9.6.145 The relationship between climate change and biodiversity in the UK has been summarised by the Inter-Agency Climate Change Forum (IAACCF, 2010). They have found that the impact on species of increased temperatures includes changes in distribution and abundances, timing of seasonal events and the timing of when habitats are used. As a result, the overall species composition, habitats and ecosystem characteristics are likely to change.

Initial Construction Phase: 2024-2029

9.6.146 It is assumed that the baseline as reported above is unlikely to change significantly in this timescale.

2030-2032

9.6.147 By 2030, an increase in visitor numbers and construction of car parks that form part of the future baseline scenario would have minimal direct impact on biodiversity.

9.6.148 With the increase in people driving or commuting to the airport there would be a potential for increased air pollution which could have an effect on habitats that are specifically sensitive to changes in nitrogen deposition levels. However, the relatively small percentage change in traffic level, together with the distance between the more sensitive habitats (such as neutral semi-improved grassland) within the Project site and the main roads, means a wider impact on the overall habitat structure or species present is considered unlikely.

9.6.149 By 2030, species assemblages are likely to be showing signs of change due to climate change, with species from the continent not previously recorded around Gatwick Airport becoming more frequent.

9.6.150 The wetter areas, the River Mole corridor (NWZ), the LERL wetland area and ponds around the site could be showing signs of lower water levels during summer by this time, with complete drying out occurring earlier in ponds.

9.6.151 This could result in impacts on wetland species and species that spend part of their lifecycle in water such as GCN, frogs, toads and grass snake. These species may be showing signs of decreasing population sizes by this time, but it is considered unlikely that changes to their habitats would be substantial and therefore it is considered unlikely that these species would have been lost from the Project site. Monitoring of populations should be carried out at key stages.

2033-2038

9.6.152 By 2033, species assemblages which had shown signs of change due to climate change may continue to exhibit these with some further changes possible by 2038.

9.6.153 The wetter areas are likely to continue to become drier earlier in the season, which could continue to affect wetland species distribution and abundance. Monitoring of populations should continue during this period.

Design Year 2038

9.6.154 Due to climate change, there may be fewer waterbodies that hold water permanently and the rivers and streams around Gatwick could have a reduced flow impacting on invertebrate and fish species that rely on them. Breeding ponds for newts could dry out sooner and impact on the timeframe that GCN have to breed.

9.6.155 Monitoring of bat activity and GCN populations should be undertaken to identify the status of these species within the wider area.

9.7. Key Project Parameters

- 9.7.1 The assessment has been based on the parameters identified within Chapter 5: Project Description.
- 9.7.2 The Project site boundary encloses an area of 820 hectares. The majority of this area is the existing operational airport and configuration of habitats would remain largely unchanged. Individual elements of the Project which would affect habitat loss are identified in Figures 5.2.1a to 5.2.1h.
- 9.7.3 Table 9.7.1 below identifies the key parameters relevant to this assessment. Where options exist, the maximum design scenario selected is the one having the potential to result in the greatest effect on an identified receptor or receptor group. Effects of greater adverse significance are not predicted to arise should any other option identified in Chapter 5 be taken forward in the final design of the Project.

Table 9.7.1: Maximum Design Scenarios

Potential Impact	Maximum Design Scenario	Justification
Initial Construction Phase: 2024-2029		
Complete loss (temporary or permanent) of all existing habitats within the areas proposed for development as part of the Project between 2024 and 2029.	Construction of the full extent of the land within the boundaries of each element of the Project (excluding a 15 metre buffer around ancient woodland).	The loss of the full extent of the habitats within the boundaries would be the maximum design scenario resulting in the greatest area of habitat loss and disturbance.
2030-2032		
Complete loss (temporary or permanent) of all existing habitats within the areas proposed for development as part of the Project between 2030 and 2032.	Construction of the full extent of the land within the boundaries of each element of the Project (excluding a 15 metre buffer around ancient woodland).	The loss of the full extent of the habitats within the boundaries would be the maximum design scenario resulting in the greatest area of habitat loss and disturbance.
Reduction in predicted area of neutral grassland, marshy grassland, woodland and trees, shrubs and hedgerows. Loss of habitat for bats, GCN and grass snake.	Habitat creation not reached desired level of establishment or partially failed.	The maximum effects could occur if the habitat creation associated with the maximum design scenario either fails partially or establishes less quickly than expected. A complete failure of habitat creation is considered unlikely.
Reduction in GCN, grass snake, bats.	Mitigation not working as effectively or as quickly as expected.	The maximum effects that could occur would be a reduction in GCN and grass snake populations or a decrease in bat activity. A complete loss of

Potential Impact	Maximum Design Scenario	Justification
		population/activity is considered to be unlikely.
2033-2038		
Loss of young woodland and neutral semi-improved grassland providing suitable terrestrial habitat for GCN and potential for grass snake to be present.	Gatwick Stream flood compensation.	This option would affect higher quality habitats and affects protected species.
Unsuccessful habitat creation.	Habitat creation not reached desired level of establishment or partially failed.	The maximum effects could occur if the habitat creation associated with the maximum design scenario either fails partially or establishes less quickly than expected. A complete failure of habitat creation is considered unlikely.
Reduction in GCN, grass snake, bats.	Mitigation not working as effectively or as quickly as expected.	The maximum effects that could occur would be a reduction in GCN and grass snake populations or a decrease in bat activity. A complete loss of population/activity is considered to be unlikely.
Design Year: 2038		
Unsuccessful habitat creation.	Habitat creation not reached desired level of establishment or partially failed.	The maximum effects would occur if the habitat creation associated with the maximum design scenario either fails partially or establishes less quickly than expected. A complete failure of habitat creation is considered unlikely.

9.8. Mitigation and Enhancement Measures Adopted as Part of the Project

9.8.1 A number of measures have been designed into the Project to reduce the potential for impacts on ecology and nature conservation. These are listed in Table 9.8.1.

Table 9.8.1: Mitigation and Enhancement Measures

Measures Adopted as Part of the Project	Justification
Mitigation and Enhancement	
The locations of all pre-construction archaeology, ground investigation and unexploded ordnance surveys would be assessed for their potential impacts on ecology and nature conservation and appropriate	To minimise the impact of construction on features of ecology and nature conservation value.

Measures Adopted as Part of the Project	Justification
mitigation would be implemented. This would include altering survey locations where practicable to avoid damage to features of high value and watching briefs to ensure such features are not impacted upon.	
The Project has been developed to avoid designated sites, areas of woodland and other ecologically sensitive habitats wherever practicable.	To minimise the impact of construction on features of ecology and nature conservation value.
The Project has been designed to avoid areas of ancient woodland. Measures would be put in place to ensure a minimum 15 metre buffer is retained between ancient woodland and construction areas. Appropriately sturdy fencing would be erected around the 15 metre buffer to prevent access by people, materials or machinery.	To minimise loss of habitats of conservation interest.
Any other existing trees, scrub and hedgerows proposed to be retained and incorporated into the design for the Project would be protected during construction. Measures would be put in place to ensure that bat foraging/commuting habitat and areas of trees, hedge or scrub to be retained are adequately protected from damage or destruction during the construction phase of the Project. Protective fencing, in accordance with BS 5837, would be erected around these features to prevent access by people, materials or machinery. This would reduce the risk of accidental damage during construction activities.	To reduce impacts on protected or otherwise notable species.
Measures for the appropriate storage of materials and fuels and the management of dust during construction activities (such as the breaking up of the existing runway) and runoff would be implemented to avoid the pollution of designated sites and the local water environment during construction and operation. Measures proposed for the construction phase would be managed through the Code of Construction Practice (CoCP). An outline CoCP is provided at Appendix 5.3.1.	To minimise the impact of construction on features of ecology and nature conservation value.
Where practicable, the small areas of semi-natural broadleaved woodland due to be lost would be cleared sensitively so that bluebell bulbs could be collected and replanted within new woodland.	To reduce impacts on protected species.
Surface access works undertaken along the margins of Pond F, or within close proximity to it, would be undertaken following an ecology method statement and with an Ecological Clerk of Works present to reduce the likelihood of effects on pennyroyal.	To reduce impacts on protected species.
Suitable habitat for breeding birds would be cleared between October and mid-February, outside of the breeding bird season as far as practicable. Where this is not feasible the vegetation, building or structure due to be removed would first be inspected by a suitably qualified ecologist. Any active nests would be retained along with a minimum 5 metre buffer around them. The buffer around more sensitive birds and birds listed on Schedule 1 of the Wildlife and	To reduce impacts on protected or otherwise notable species.

Measures Adopted as Part of the Project	Justification
<p>Countryside Act (1981) (as amended) would be increased, to avoid disturbance.</p>	
<p>Additional breeding bird surveys would be undertaken prior to construction commencing to determine the presence or absence of Schedule 1 species; peregrine, little ringed plover and firecrest.</p>	<p>To reduce impacts on protected species.</p>
<p>Any nest of a Schedule 1 species found to be active during construction works would be protected by a suitably sized buffer that would be identified by a suitably experienced ornithologist. Where necessary, such nests would be monitored during construction by the ornithologist for signs of disturbance and where necessary methods would be altered to prevent it.</p>	<p>To reduce impacts on protected species.</p>
<p>At least part of the mitigation area in the west of the site would be managed to provide a suitable nesting site for skylark.</p>	<p>To minimise the impact of construction on features of ecology and nature conservation value.</p>
<p>Previous work on bird strike risks and management has been taken into consideration during the design process, including in the chosen locations and specification of new landscape planting.</p>	<p>To minimise the impact of operation on features of ecology and nature conservation value.</p>
<p>Receptor areas for GCN and grass snake would be prepared, and the species translocated into these areas, using appropriate methods and timings prior to construction commencing within suitable habitats.</p>	<p>To reduce impacts on protected species.</p>
<p>Areas of lower value reptile habitat that could support low numbers of grass snake, such as the drainage ditches and tree lines around and within car parks, would be cleared sensitively with an ecological clerk of works present.</p>	<p>To reduce impacts on protected species.</p>
<p>Active badger setts that would be damaged or destroyed, or which could result in badgers using them being disturbed, would be closed using appropriate methods and timings.</p>	<p>To reduce impacts on protected species.</p>
<p>The following measures would be implemented to ensure that no badgers are harmed during the construction phase:</p> <ul style="list-style-type: none"> ▪ suitably sturdy fencing to be erected around all construction works to deter foraging badgers from the works' areas; ▪ any excavated holes to have a wooden board placed in them over night so as to provide a means of escape should any badgers accidentally enter the excavation; and ▪ any chemicals to be securely stored at night in a locked container. <p>In order to avoid attracting badgers to the works area any food waste would be disposed of in appropriate bins or removed from site at the end of each day.</p>	<p>To reduce impacts on protected species.</p>
<p>Lighting during both construction and operation would be designed in order to avoid disturbance to areas of value for bats by directing lighting towards working areas and shielding adjacent habitats of value. Measures proposed for the construction phase would be managed</p>	<p>To reduce impacts on protected species.</p>

Measures Adopted as Part of the Project	Justification
through the Code of Construction Practice (CoCP). An outline CoCP is provided at Appendix 5.3.1.	
Creation of new, high value habitats comprising a mixture of wet and dry neutral grasslands along the new channel of the River Mole and within the Museum Field and adjacent flood compensation areas to provide new habitats for grass snake and other fauna displaced during the diversion of the River Mole and construction of the flood compensation areas.	To minimise the impact of construction on features of ecology and nature conservation value.
Creation of new, high value habitats comprising neutral and marshy grassland within Gatwick Stream flood compensation area in the east of the Project site to mitigate for habitats lost and to create new habitats for grass snake and GCN displaced during the construction of the flood compensation area.	To minimise the impact of construction on features of ecology and nature conservation value.
Creation of new habitats within a newly created mitigation area in the western part of the Project site comprising woodland, scrub planting, grassland creation and wetland/pond creation.	To minimise the impact of construction on features of ecology and nature conservation value.
Tree and shrub planting to compensate for loss of existing habitat, to provide nesting sites for breeding birds and to maintain and enhance connectivity for foraging and commuting bats.	To minimise loss of habitats of conservation interest and to reduce impacts on protected species. To improve habitat connectivity around the perimeter of the site for bats.
Woodland creation to compensate for loss of existing habitat, to provide nesting sites for breeding birds and to maintain connectivity for foraging and commuting bats to compensate for the loss of woodland, scrub and hedgerow due to highway improvements. New woodland would be created along new road alignments and within areas connecting to it where feasible to do so.	To minimise loss of habitats of conservation interest and to reduce impacts on protected species.
Restoration of temporary land take to habitats of existing or greater ecological value.	To minimise loss of habitats of conservation interest.
The retention of a strip of woodland between the Gatwick Stream and new highway alignments/water attenuation area to retain a dark corridor and well-used bat foraging and commuting route.	To minimise loss of habitats of conservation interest and to reduce impacts on protected species.
An existing non-native hedgerow comprising <i>Leylandii</i> between the A23 London Road and Perimeter Road East would be replaced with a native species-rich hedgerow, subject to evaluation in relation to the airport safeguarding requirements that wildlife strike hazard should not increase.	To strengthen habitat connectivity east of the airfield.
Provision of bat roost features within higher value habitats away from the airfield and suitable for the species present.	To compensate for loss of existing bat roost features.
Landscape planting to include a variety of native trees and shrubs and wildflower grasslands.	To provide habitats of conservation interest and improve habitat connectivity.

Measures Adopted as Part of the Project	Justification
Tree and shrub planting to reinforce retained tree lines within existing car parks and to improve habitat connectivity across them.	To provide habitats of conservation interest and improve habitat connectivity.
Creation of a new pond designed to provide a high value habitat for aquatic flora, invertebrates and amphibians within a mitigation area.	To provide habitats of conservation interest.
Woodland creation and tree and shrub planting.	To provide habitats of conservation interest and improve habitat connectivity.
Diversion of the River Mole would create an increased length of channel with a more natural profile.	To provide habitats of conservation interest.
The airfield satellite construction compound would occupy land outside of the River Mole diversion footprint to allow the new river channel to establish early in the Project. A minimum 8 metre buffer would be created along the channel.	To provide habitats of conservation interest.
Creation of refugia and hibernacula within newly created habitats for GCN and grass snake.	To provide habitats of conservation interest.
Creation of south facing mosaic of grassland with occasional scrub to provide suitable habitat for a variety of terrestrial invertebrates and grass snake on the northern bank of the newly diverted section of the River Mole and the area to the north of it.	To enhance terrestrial invertebrate and grass snake habitat.
Monitoring	
Monitoring of GCN and grass snake populations affected.	To determine success of mitigation and identify remedial measures if required.
Monitoring of bat activity.	To determine success of mitigation and identify remedial measures if required.
Monitoring of badger setts.	To determine success of mitigation and identify remedial measures if required.

9.9. Assessment of Effects

Pre-Construction: Up to 2024

- 9.9.1 A number of pre-construction surveys would be undertaken, including intrusive surveys such as ground investigation excavations and archaeological trial trenching, together with unexploded ordnance surveys. The mitigation measures designed into the Project would ensure that high value habitats would be avoided as far as practicable and that any localised impacts on habitats for protected species, such as nesting birds, grass snake and GCN would be avoided.
- 9.9.2 Effects would be controlled through the CoCP, which would ensure that ecological constraints are taken into account in agreeing the locations and methodologies for these pre-construction works.

Initial Construction Phase: 2024-2029

Statutory Designated Sites

- 9.9.3 There are no statutory designated sites within the Project site boundary. The nearest statutory designated site of County importance is Willoughby Fields LNR, located approximately 786 metres from the site. The nearest site of national importance is Glover's Wood SSSI, located approximately 1.6 km away, while the nearest site of international importance is Mole Gap to Reigate Escarpment SAC, approximately 9.2 km away.
- 9.9.4 Due to the distance between the statutory designated sites and the Project site boundary, and the mitigation measures designed into the Project to ensure that possible pollutants are prevented from reaching them, the construction of the Project would have no impact on statutory designated sites. Further details of the pollution control measures that would be put in place can be found in Appendix 5.3.1. There would be no effect arising at designated sites as a result of loss or alteration to the habitats or disturbance or harm to species present. Given this, the magnitude of impact and significance of effect on these international, national and county value receptors would be **no change** and therefore not significant. Further details of effects on internationally designated sites are provided in Appendix 9.9.1.

Non-statutory Designated Sites

- 9.9.5 There is one non-statutory designated site within the Project site boundary: Horleyland Wood LWS, which is ancient woodland.
- 9.9.6 Works to construct a new car park would be undertaken to the east (at Pentagon Field) with the nearest construction works being 300 metres away. Construction works on the airfield associated with new taxiways would be approximately 200 metres away at the nearest point but separated from the woodland by a railway, main A road (A23) and further car parking.
- 9.9.7 The remaining non-statutory designated sites are more than 600 metres from the Project site boundary and are therefore less sensitive to effects from construction.
- 9.9.8 Mitigation measures designed into the Project, including installing protective fencing around retained vegetation and ensuring that possible pollutants are prevented from reaching the non-statutory designated sites, would ensure that the Project would have no impact upon Horleyland Wood LWS. There would therefore be no effect due to loss or alteration to the habitats or disturbance or harm to species present. As such, the magnitude of impact and significance of effect on these County value receptors would be **no change** and therefore not significant.

Ancient Woodland

- 9.9.9 Four areas of ancient woodland are present within the Project site boundary: Horleyland Wood; Lower Picketts Wood; Brockley Wood and a section of woodland along the north west side of the River Mole. The potential impacts from contamination from pollution events and the measures to protect Horleyland Wood are described above for non-statutory designated sites.
- 9.9.10 These measures would also be relevant to Lower Picketts Wood to the east which would be in close proximity to the construction of car parking at Pentagon Field. The mitigation measures designed into the Project would ensure a minimum 15 metre buffer was retained and protected along the boundary of the woodland to protect it.

- 9.9.11 Ground levels at Pentagon Field would be raised prior to the construction of the car park. No infill materials would be placed within 15 metres of Lower Picketts Wood to ensure the root protection area of the trees within the woodland was protected.
- 9.9.12 The proposed decked car park at Pentagon Field is located to the north of Lower Picketts Wood and therefore would not result in the shading of the woodland. Similarly, the increased ground level would not result in any increase in shading.
- 9.9.13 Construction works associated with creating the airfield satellite contractor compound and diversion of the River Mole corridor would be undertaken in proximity to Brockley Wood, resulting in the loss of some of the habitats to the south of it for the full construction period (2024-2035 in the case of the contractor compound). A minimum 15 metre buffer would be provided around this area of woodland to ensure it was protected from accidental damage. The security fencing around the compound would be at least 15 metres from the woodland edge, thereby ensuring there could be no access by personnel and machinery and that no materials would be stored within or adjacent to it.
- 9.9.14 A lighting strategy for the construction period will be developed to identify the type of lighting to be used and measures to be implemented to reduce light spill, taking into account effects on nearby sensitive receptors, such as ancient woodland.
- 9.9.15 Implementation of the mitigation described above would ensure that the Project would have no impact upon ancient woodland during the construction phase. There would be no impact resulting in loss or alteration to the habitats or increased disturbance. Given this, the magnitude of impact and significance of effect on this receptor of regional value would be **no change** and therefore not significant.
- 9.9.16 An assessment of the effects of air quality on ancient woodland will be included in the ES.

Habitats

Semi-natural Broadleaved Woodland and Mature Broadleaved Trees

- 9.9.17 Areas of semi-natural broadleaved woodland and individual broadleaved trees would be lost due to the following construction works that would require site clearance between 2024 and the end of 2029.
- Diversion of River Mole corridor.
 - Construction of hotel and multi-storey in existing Car Park H.
 - Replacement 'Purple Parking' at Crawter's Field.
 - Pentagon Field parking.
 - Museum Field flood compensation/storage area.
 - East of Museum Field flood compensation area.
 - Car Park X flood compensation area.
 - Noise mitigation feature.
 - Set up of airfield satellite contractor compound on land south of Brockley Wood.
 - Surface access satellite contractor compounds for South and North Terminal roundabout improvements.
 - Improvements to North Terminal roundabout.
 - Alterations to Longbridge roundabout.

- 9.9.18 The improvements to the North Terminal roundabout may require construction works and working areas to be created within the highway boundary along the southern edge of Riverside Garden Park. This could potentially result in the direct loss of a relatively thin strip of plantation broadleaved woodland (highway planting). Woodland to the north would be retained, ensuring a substantial amount of the existing woodland would remain present. This would ensure habitat connectivity is not lost.
- 9.9.19 The mitigation measures designed into the Project would ensure retained areas of woodland adjacent to working areas are protected from physical damage.
- 9.9.20 Upon completion of the works, new areas of broadleaved woodland would be created along the new highway alignment to compensate for the loss and to strengthen habitat connectivity. Additional woodland planting would have already been undertaken in other areas within the Project site boundary to further compensate for the loss. The woodland would still be young in 2029 and would therefore not directly compensate for the loss of any woodland until it had matured.
- 9.9.21 Replacement Purple Parking at Crawter's Field would also result in the loss of semi-natural broadleaved woodland at the western end of Crawter's Wood. A woodland buffer would be retained along the southern boundary of the woodland, thereby ensuring habitat connectivity and a dark corridor would be retained and the overall loss of habitat would be small in relation to the overall habitat resource present in this part of the Project site.
- 9.9.22 The retained woodland strip would be protected during construction and new broadleaved woodland planting would be undertaken elsewhere within the Project site boundary to compensate for the loss.
- 9.9.23 Some of the construction works listed above would result in the loss of small areas of semi-natural broadleaved woodland, which would result in the loss of small areas of woodland in the context of existing larger woodland areas. Therefore, despite the loss, areas of woodland would be retained in each location. Individual broadleaved trees would also be lost from some of the locations, including small clumps of trees and tree lines. No veteran trees would be lost.
- 9.9.24 Woodland and tree planting would be undertaken early in the Project programme to compensate for this loss. However, there would be a long-term loss of woodland and trees due to the amount of time it would take for the new planting to reach maturity.
- 9.9.25 The combined loss of semi-natural broadleaved woodland and trees would result in a long-term, low magnitude impact to a receptor of County importance resulting in a **minor adverse** significance of effect which is not considered to be significant.

Hedgerows

- 9.9.26 The reconfiguration of airport facilities in 2024-2025 associated with relocating the CARE facility (Option 2), motor transport facilities and Rendezvous Point North and the construction of the North Terminal Long-stay Car Park would result in the loss of species-poor hedgerows within existing car parking areas. The hedgerows are relatively low value habitats due to their locations within large areas of hard standing and their low species diversity.
- 9.9.27 Landscape planting would be undertaken around the new facilities and car parking that would include the creation of native, species-rich hedgerows to compensate for those lost. However,

this would not occur until after the works were complete (likely winter 2030/31 and 2032/33). There would be a medium-term loss of hedgerows followed by a long-term increase in hedgerow value, due to species-poor hedgerows being replaced with species-rich hedgerows. The overall impact would be negligible on a receptor of County importance resulting in a **negligible** significance of effect.

- 9.9.28 The improvements to the South Terminal roundabout would result in the loss of species-poor hedgerow with trees during site clearance in 2029. The hedgerow in this area forms part of an east-west habitat corridor also comprising scrub and broadleaved plantation woodland which would also be lost.
- 9.9.29 This would result in the medium-term loss of a species-poor hedgerow and trees, being of County importance and a reduction in habitat connectivity. This loss would be compensated for through the planting of native, species-rich hedgerows once the highways works were complete. However, there would be a loss of habitat and connectivity during the construction phase and until any new planting had established.
- 9.9.30 When considered in combination with the loss of broadleaved plantation woodland and scrub, this would result in a medium-term medium magnitude of impact to a receptor of County importance resulting in a **moderate adverse** significance of effect.
- 9.9.31 Additional hedgerow planting would be undertaken early in the construction period along Larkins Road and between the A23 London Road and Perimeter Road East to provide an increase in the amount of hedgerow on the Project site and to enhance connectivity across it.
- 9.9.32 This would result in a long-term medium magnitude impact to a receptor of County importance resulting in a **moderate beneficial** significance of effect.

Watercourses

- 9.9.33 General airfield construction activities and the start of the construction of the North and South Terminal roundabout improvement works have the potential to impact on all watercourses. Best practice measures to mitigate the construction impacts (implemented through the CoCP and reported in Chapter 11: Water Environment) would substantially control impacts and no significant effects have been identified.
- 9.9.34 Flood compensation works would be undertaken in the west and south of the site. This would include the construction of a new channel connecting the River Mole to the Museum Field and east of Museum Field flood compensation areas and the construction of a new channel connecting the River Mole to the Car Park X flood compensation area.
- 9.9.35 The construction of the new channels would result in the short-term loss of two small sections of the existing riverbank where they connect. In the long-term, new bank side habitats would develop along the new channels resulting in a net increase in bankside habitats.
- 9.9.36 Mitigation measures would be put in place to protect the River Mole from potential pollution events through appropriate measures to contain them. This would include limiting the amount of sediment entering the stream during channel construction.
- 9.9.37 There would be a short-term impact on the river when the flood compensation works are undertaken. Given that a very short stretch of the river would be affected, this would result in a

short-term, negligible impact to a receptor of County value resulting in a **negligible** significance of effect.

9.9.38 The creation of new bankside habitats and channels, connecting flood compensation areas to the River Mole, that are intermittently wet would increase the overall habitat resource. This would result in a long-term, low impact to a receptor of County value resulting in a **minor beneficial** significance of effect.

9.9.39 A short section of the River Mole would be diverted as part of the Project. During the construction phase this would involve constructing a new channel and diverting the existing river into it between 2024 and 2025. Flora and fauna from the existing channel would be translocated into the new channel. The existing section of river would then be infilled.

9.9.40 There would be a medium-term negative impact on the river when first constructed due to the small loss of part of the original channel and before flora have not fully established and associated fauna have not colonised the new channel. Given that a relatively short stretch of the river would be affected, this would result in medium-term, low impact to a receptor of County value resulting in a **minor adverse** significance of effect.

9.9.41 In the long-term, new and translocated habitats and species would be establishing within the new channel. Habitats adjoining the new river corridor would also be restored to grassland from 2035 when the airfield satellite contractor compound would be decommissioned. This would result in a longer length of stream and associated habitats, designed to be of higher value than the section of river lost, resulting in a long-term, medium impact on a receptor of County value. This would result in a **minor beneficial** effect.

9.9.42 Any delays in the Project construction or failures in habitat or species establishment identified during monitoring would mean the realignment could continue to have a medium-term negative impact on the river. Given a relatively short stretch of the river would be affected, this would result in a medium-term, low impact to a receptor of County value resulting in a **minor adverse** effect.

Ponds (NERC S.41 Habitat)

9.9.43 No ponds qualifying as a NERC S.41 Habitat would be directly impacted by the Project. Measures to protect habitats of value designed into the Project, including pollution prevention measures and the erection of sturdy fencing around higher value habitats, would ensure that no adverse effects are likely. The magnitude of impact and significance of effect would be **no change**.

Ponds (not NERC S.41 Habitat)

9.9.44 Two ponds would be directly affected by the Project. Pond A and Pond FFJ would be removed during the period 2024 to 2025 to allow for the reconfiguration of the northern runway and taxiways. A new pond would be created to compensate for the loss of Pond A during the same period to the north of its current location and to the south of the newly diverted River Mole.

9.9.45 A new pond would also be created on land north-west of Ponds A and FFJ within a mitigation area at the same time that this area is established. It would be created specifically for wildlife and would therefore have the potential to develop into a higher value habitat than the ponds being lost.

- 9.9.46 Pond F would be affected due to the construction of a retaining wall along it to allow the rearrangement of the westbound access from the South Terminal roundabout. The retaining wall would be likely to be constructed using a sheet pile method. As such, there is the potential to cause an increase in silt within the pond during piling as well as disturbance of fish and other wildlife using it.
- 9.9.47 The permanent loss of Pond FFJ, the medium-term loss of Pond A, the medium-term disturbance to Pond F and the creation of a new pond that would be of value in the long-term, would result, in a medium-term, medium magnitude impact to a receptor of local value due to a reduction in the amount of pond habitat within the Project site boundary until new ponds had been created. This would result in a **minor adverse** effect. In the long-term, once the new ponds had established, the impact would be negligible. This would result in an overall low adverse impact to a receptor of local value resulting in a **minor adverse** significance of effect.

Semi-improved Neutral Grassland

- 9.9.48 Small areas of semi-improved neutral grassland would be temporarily lost during the construction of the airfield satellite contractor compound and the diversion of the River Mole in the west of the Project site, south of Brockley Wood and in the north east of the Project site due to the South Terminal roundabout improvements. There would be a long-term, temporary loss whilst the compound remains present between 2024 and 2035. Semi-improved neutral grassland would be recreated upon completion of all the works affecting the habitat. New areas of semi-improved neutral grassland would also be created within a mitigation area in the west of the Project site, early in the construction period. This would compensate for the remaining areas of grassland that would be lost from construction areas and increase the overall amount of neutral semi-improved grassland on the Project site by the end of the construction period. There would be an overall long-term, medium magnitude impact on a receptor of local value which would result in a **minor adverse** significance of effect when existing habitats were lost and before newly created habitats had established. This would be followed by an overall long-term, medium magnitude impact on a receptor of local value which would result in a **minor beneficial** significance of effect when construction is complete due to the long term net increase in the amount of semi-improved neutral grassland within the Project site.

Marshy Grassland

- 9.9.49 Areas of marshy grassland would be impacted in the west of the site due to the siting of the airfield satellite contractor compound and diversion of the River Mole corridor south of Brockley Wood and by the construction of a new channel connecting the River Mole to the East of Museum Field flood compensation area.
- 9.9.50 There would be an increase in the amount of marshy grassland in the long-term due to an increase in the amount of damp ground within the Museum Field and East of Museum Field flood compensation areas and along the diverted River Mole corridor in the west of the site. Therefore, there would be a net increase in the amount of marshy grassland.
- 9.9.51 A small area of marshy grassland would also be lost to provide an extension to the dog kennel pond in the north-west of the site.

- 9.9.52 There would be a medium-term, low adverse impact on a receptor of local value resulting in a **minor adverse** effect. This would be followed by a long-term medium beneficial impact resulting in a **minor beneficial** significance of effect.

Broadleaved Plantation Woodland and Associated Scrub

- 9.9.53 The siting of the South Terminal surface access satellite contractor compound in the north east of the Project site would result in the loss of a small amount of broadleaved plantation woodland and scrub, approximately 10 metres wide, in 2024 where access from the main carriageway to the compound is created.
- 9.9.54 Improvements to the South Terminal roundabout would result in the further loss of broadleaved plantation woodland and scrub in 2029. The woodland forms an east-west habitat corridor along the northern and southern boundaries of the existing South Terminal roundabout, M23 and Airport Way between the B2036 Balcombe Road and the mainline railway (approximately 675 metres long). The full extent of the plantation woodland to the north of the roundabout and road would be lost. The plantation woodland to the south is wider and therefore a strip of woodland would be retained to the south of the works.
- 9.9.55 In 2029, the improvements to the North Terminal roundabout would result in the loss of additional broadleaved plantation woodland that forms an east-west habitat corridor between the existing North Terminal roundabout and A23 London Road. This measures approximately 1.2 km long, although is already dissected by slip roads thereby limiting connectivity for some less mobile flora and fauna.
- 9.9.56 The improvements to the North Terminal roundabout would also result in the loss of some plantation woodland on the northern side of the A23 road. This would result in a slight reduction in habitat connectivity at the far eastern end where the existing woodland adjoins the mainline railway corridor.
- 9.9.57 The loss of habitat connectivity has been assessed in combination with the loss of semi-natural broadleaved woodland from the north of the North Terminal roundabout improvements and the loss of hedgerow from the South Terminal roundabout improvements, the effects of which are reported earlier. Overall, there would be a substantial decrease in the existing linear woody vegetation, which currently provides a near continuous connection from east to west through the north of the Project site. There would also be a greater distance from north to south between the linear strips of woody vegetation.
- 9.9.58 However, the trees and shrubs within the linear strips are typically less than 60 years old, having been planted when the roads were constructed and are therefore of less value than the more mature trees and shrubs present within the nearby Riverside Garden Park. Additionally, some of the surrounding habitats to which this habitat connects are low value, such as the airport and the M23 motorway.
- 9.9.59 Replacement native, broadleaved woodland would be planted upon completion of the improvements to the South Terminal roundabout in 2030 and to the North Terminal roundabout in 2032 to compensate for this loss.
- 9.9.60 Due to the amount of time needed for new woodland to establish sufficiently (approximately 30+ years) to compensate for the loss, the combined effect of the loss of woodland, hedgerow and

scrub along both sides of the A23 London Road would result in a long-term, high magnitude impact on a receptor of County value resulting in a **moderate adverse** significance of effect.

9.9.61 Woodland planting would start providing a benefit to biodiversity within approximately five years after planting by providing food and shelter for some invertebrates and small mammals, and potentially nesting sites for birds. The significance of the adverse effect would start reducing at this point but it would take at least 30 years for the full effect of the loss to be removed.

9.9.62 Once new woodland had established, there would be a small increase in the amount of broadleaved woodland present which would result in a long-term, low beneficial impact resulting in a **minor beneficial** significance of effect.

9.9.63 It is noted that the location of the South Terminal surface access satellite contractor compound is highlighted for long-term development by others (to build Horley Business Park).

Flora: Bluebell and Pennyroyal

9.9.64 The majority of the areas of semi-natural broadleaved woodland that would be lost at this stage of the Project were originally planted approximately 50 to 60 years ago and are therefore unlikely to support naturally occurring bluebell. Small areas of more mature woodland or tree lines connecting to areas of ancient woodland that would be affected south of Brockley Wood and within car parking areas in the east of the site would have greater potential to support them.

9.9.65 Mitigation measures to protect bluebell by collecting bulbs during the clearance of woodland and replanting them within woodland planted in the mitigation area would ensure the long-term impact on bluebells, which are of local value, would be low. This would result in a **minor adverse** significance of effect.

9.9.66 Sheet piling works along the northern margins of Pond F would not directly affect the location where pennyroyal is growing around it but there would be potential for accidental damage. Mitigation measures would be put in place to reduce the likelihood of such affects. Therefore, the Project could result in a medium-term, medium impact on a plant of local value resulting in a **minor adverse** significance of effect.

Flora: Lesser Quaking Grass, Narrow-lipped Helleborine, Ragged Robin and Solomon's Seal

9.9.67 No construction works would be undertaken within the locations where notable flora were noted. Measures to protect habitats of value from pollution events would ensure the plants are not affected. This would ensure there would be no change to the presence or distribution of the species due to the Project. The magnitude of impact and significance of effect would be **no change**.

Breeding Birds (Annex 1 EU Birds Directive and/or Listed under Schedule 1 of the WCA)

9.9.68 No Schedule 1 breeding birds were confirmed to be present and therefore no effects are currently foreseen. Further surveys will be undertaken to determine whether any Schedule 1 birds were breeding within the Project site boundary as a precaution prior to construction works commencing. Should Schedule 1 breeding birds be present, measures would be put in place to ensure they were not disturbed by any Project related work. This would include identifying appropriate buffers around the nest within which works that could lead to disturbance would be prohibited. The nests would also be closely monitored by suitably experienced ornithologists who

would undertake dynamic risk assessments to ensure mitigation measures were altered to further reduce the risk of disturbance if necessary.

Breeding Bird Assemblage (including NERC Species of Principal Importance and BoCC Red or Amber listed species)

- 9.9.69 The works due to be undertaken between 2024 and 2029 would result in the loss of a range of habitats suitable for breeding birds across the Project site, including buildings and structures as well as vegetation.
- 9.9.70 Areas of grassland, scrub and scattered trees would be impacted in the west of the Project site due to the siting of the airfield satellite contractor compound south of Brockley Wood, diversion of the River Mole corridor, construction of a noise mitigation feature and relocation of the fire training ground. The species assemblage in these areas includes reed bunting and kestrel, which are Amber listed species and song thrush and skylark, which are Red listed species.
- 9.9.71 In the long-term, Pond A and the diverted River Mole would create new areas of suitable habitat. A new area of marshy grassland would already have been created in the west of the site, near to the River Mole rerouting, and would be establishing during this period.
- 9.9.72 Species such as kestrel and song thrush are less likely to be affected by the construction works in this area given the large amount of alternative habitat within and immediately adjacent to the Project site boundary.
- 9.9.73 Reed bunting is predominantly associated with farmland and wetland habitat and therefore the loss of the pond, river corridor and marshy grassland in this area could adversely affect the amount of suitable breeding habitat. There would be a medium-term loss of pond and river corridor habitats and a long-term loss of marshy grassland whilst the works take place during the period 2024 to 2035 and during the time it would take for new habitats to establish.
- 9.9.74 Construction of flood compensation at Museum Field and East of Museum Field would result in the loss of farmland habitat that could be used by reed bunting, resulting in a loss of some alternative habitat nearby during the construction period 2024 to 2025. Further areas of suitable farmland would remain present within the wider area.
- 9.9.75 The completion of the Museum Field and East of Museum Field flood compensation areas would create a new, larger area of marshy grassland of higher value to reed bunting than the existing farmland once established after its creation in 2025. New marshy grassland would also be created within the diverted river corridor in 2025 when construction is complete and further areas would be created when the airfield satellite contractor compound becomes decommissioned in 2035. There would be a long-term increase in the amount of wetland habitats, post-2025 once new habitats have established with a further small increase post-2035, resulting in more habitat for reed buntings than those originally present.
- 9.9.76 Overall, there would be a loss of breeding habitat in the medium-term as a result of the Project resulting in a medium adverse impact on this species of County value resulting in a **moderate adverse** effect. This would be followed by a moderate increase in the amount of breeding habitat locally in the long-term, providing a low beneficial impact which would result in a **minor beneficial** effect. Overall, there would be a long-term, low adverse impact which would result in a **minor adverse** effect.

- 9.9.77 Skylark territories were recorded in the airside amenity grassland areas, adjacent to the runway in the south of the Project site. The diversion of utility works associated with Taxiway Juliet, the northern runway and associated spurs would impact upon suitable breeding habitat in this area through the displacement of skylark territories. However, the impacts arising during construction would be temporary and localised to the northern boundary of the runway where the works would be undertaken. Mitigation would be provided by creating alternative suitable habitat within the mitigation area in the west of the Project site during the initial stages of the Project. This would reduce the duration of the adverse impact of habitat loss to short-term. In the medium-term, once construction works are complete, new areas of suitable habitat would develop on the airfield. The short-term, low impact on skylark, which is of County value would result in a **minor adverse** effect.
- 9.9.78 The North Terminal Long Stay decked car park (phase 1) works, flood alleviation works at Car Park X, Larkins Road diversion and relocation of CARE Option 2/motor transport/Rendezvous Point North are predominantly located within areas of existing hardstanding, bordered by scattered trees, scrub, ornamental planting and hedgerow. These features offer some value to nesting birds and some would be lost to the Project.
- 9.9.79 The stand amendments, reconfiguration of airport facilities and terminal extensions have the potential to disturb nesting sites for a variety of common species of breeding bird. There could be short to medium-term reductions in nesting site availability, but the construction of new buildings and structures will provide alternative nesting sites.
- 9.9.80 Areas of plantation woodland and broadleaved trees would be lost in areas proposed for a new hotel and surface car parking at multi-storey Car Park H in the north east of the site. A small area of woodland, scrub and broadleaved trees would also be lost around the periphery of the Project site due to new car parking at Pentagon Field and replacement Purple Parking at Crawter's Field.
- 9.9.81 The construction of the South Terminal surface access satellite contractor compound in the north east of the Project site in 2024, followed by the improvements to the South Terminal roundabout would result in the loss of a large amount of species-poor hedgerow with trees, scrub and broadleaved plantation woodland, which are suitable for breeding birds, including dunnock, bullfinch and song thrush (recorded during surveys undertaken in 2019). The loss of habitat associated with these works would be partially compensated for through the planting of native, species-rich hedgerows and woodland once the highways works are complete in 2030, although there would be a temporary, long-term loss until new planting is established.
- 9.9.82 At the same time, there would be a significant loss in the north of the site due to the loss of woodland habitats during improvements to the North Terminal roundabout. The improvements would result in the loss of areas of broadleaved plantation woodland to the south. This habitat is suitable for breeding bird species including dunnock, which is an Amber listed species, and mistle thrush and song thrush, which are Red listed species.
- 9.9.83 The works due to be undertaken from 2026 would result in the loss of a range of habitats suitable for breeding birds across the Project site.
- 9.9.84 Woodland, broadleaved tree and shrub planting would be undertaken early in the Project to compensate for the loss. However, there would be a long-term loss of these habitats due to the amount of time it would take for the new planting to reach maturity, particularly woodland. These

areas are likely to be used by a variety of bird species for foraging and nesting, however it is likely that birds displaced from these areas would move to nearby suitable habitat.

- 9.9.85 Additional mitigation measures would include retaining a 15 metre buffer around areas of ancient woodland, which would limit the levels of disturbance on birds using these areas.
- 9.9.86 Mitigation measures would be put in place to ensure birds and their nests were not harmed by the clearance of vegetation or by other demolition and construction works.
- 9.9.87 Overall, the mitigation measures would ensure that areas of suitable foraging and nesting habitat are replaced across the Project site and birds displaced from areas of construction would be likely to move to similar areas of suitable habitat within and adjacent to the Project site boundary. However, the time it would take for new planting to establish as a habitat of equal value would result in a long-term loss and a reduction in habitat connectivity. Nonetheless, this would not result in the complete loss of breeding sites and substantial areas of habitat would be retained within the Project site and within the vicinity.
- 9.9.88 The loss would result in a long-term, medium impact on other breeding birds (a feature of County value) due to the amount of time habitats would be absent, resulting in a **moderate adverse** effect. In the long-term, there would be a gain in the amount of habitat available which would have a low beneficial impact resulting in a **minor beneficial** effect.
- 9.9.89 An increase in noise due to construction works is considered unlikely to increase the significance of the effects reported above. The birds in the area are already habituated to high levels of noise from both aeroplanes and traffic.

Wintering Bird Assemblage (including BoCC Red or Amber listed species)

- 9.9.90 The works due to be undertaken between 2024 and 2029 would result in the loss or disturbance of habitats suitable for wintering birds, principally around the periphery of the Project site.
- 9.9.91 During surveys undertaken in 2018 and 2019, there were no wintering bird species recorded in any numbers that were considered to be of national or international significance. The overall impacts from loss of foraging habitat on a receptor of local value during construction between 2024 and 2029 within the Project site boundary would be low and medium term, resulting in a **minor adverse** effect.

Grass Snake

- 9.9.92 Two populations of grass snake were identified within the Project site boundary. The small population in the east of the site would not be affected by any construction activities during this phase of the Project. The larger population in the west of the site (NWZ) is associated with the wetland and grassland habitats along the corridor of the River Mole. The southern extent of this habitat would be temporarily lost due to the construction and use of the airfield satellite contactor compound (2024-2035) and the diversion of the River Mole corridor, the relocation of Pond A and the East of Museum Field flood compensation area (2024-2025).
- 9.9.93 A translocation exercise would be undertaken to move grass snake into existing retained habitat protected from construction areas or into newly-created and connected habitat within a mitigation area to the west prior to construction works affecting the existing habitat.

9.9.94 The completion of the Museum Field and east of Museum Field flood compensation areas and the creation of new habitats along the corridor of the diverted River Mole, would create new areas of habitat in the long-term thereby providing an increase in the amount of habitat available to grass snake in this area. Further areas of suitable habitat would then be created in 2035 when the airfield satellite contractor compound is decommissioned.

9.9.95 Due to the potential stress to individual snakes and risks associated with creating new habitats, the translocation could have a medium-term, low impact on the grass snake population present which is of local value, resulting in a **minor adverse** significance of effect.

Great Crested Newt

9.9.96 Two metapopulations of GCN were recorded within the Project site boundary. A small population was recorded in two closely located ponds in the north west of the site, west of the River Mole. The River Mole is considered a barrier to newt dispersal due to its steep sided channel and flowing water. Therefore, works within terrestrial habitats within 500 metres of the ponds but to the east of the River Mole would be unlikely to affect any GCN. This includes the Larkins Road diversion and the relocation of CARE Option 2/motor transport facilities/ Rendezvous Point North. The majority of the work proposed within this area would be within areas of existing hardstanding which provides unsuitable habitat for GCN further reducing the risk of effect. No work is currently proposed on the western side of the River Mole within 500 metres of the ponds.

9.9.97 New pond creation would create suitable breeding sites for GCN within a mitigation area in the west of the Project site providing opportunities for the existing metapopulation to extend in size and into new areas of the Project site thereby creating a more stable population less likely to be affected by any (non-Project related) effects. This would have a medium, long-term beneficial impact on a receptor of local value resulting in a **minor beneficial** effect.

9.9.98 A medium population of GCN was recorded in two closely located ponds in the east of the site within woodland near to Crawley Sewage Treatment Works. The proposed car park within Pentagon Field and flood storage areas in the LERL would affect suitable GCN terrestrial habitat comprising grassland within 500 metres of the ponds.

9.9.99 A GCN mitigation strategy would be devised and works would be undertaken under a Natural England mitigation licence to ensure no GCN were harmed or disturbed by the works.

9.9.100 Due to the distance of the affected habitats from the ponds, the risk of GCN being encountered is expected to be low. The grassland that would be lost is unlikely to form a core area of GCN terrestrial habitat (it is anticipated that the woodlands surrounding the ponds perform this function). Therefore, the medium-term impacts would be low and the effects on the GCN population of local value would be **negligible**.

Common Toad

9.9.101 The construction phase would result in the reduction in size of suitable terrestrial habitat for common toads when the airfield satellite contractor compound is constructed/in use, the River Mole corridor and Pond A are relocated, and East of Museum Field flood compensation area is constructed. Although there would be a reduction in the size of suitable habitat present, a significant habitat resource would remain within the local area to sustain the population present. Upon completion of the works in 2025 there would start to be an increase in the amount and value of suitable habitat present within these work areas as the new habitats establish. This

would result in a long-term, low impact on a receptor of local value as favourable habitats would be restored and extended upon construction completion. This would result in a **negligible** effect.

Badger

- 9.9.102 A main badger sett would be closed to allow the Project to be constructed and an artificial sett would be created within the badger social group's territory. The sett would be closed using appropriate methods and timings.
- 9.9.103 Further surveys would be required pre-construction to better understand the size and location of the badger territory and to identify other setts within it.
- 9.9.104 Although the closure of the sett would be undertaken under licence from Natural England, the closure of the main sett would result in a medium-term, low impact on the badger clan which is of local value, resulting in a **minor adverse** effect.
- 9.9.105 The increase in construction traffic and associated movements in areas around setts on site would mean that there would be the potential for a corresponding increase in road mortality for badgers using the site. However, it is not expected that badger movement (principally at night) and construction would overlap significantly. There would be construction undertaken at night on the airfield, but this is not considered to be an area well used by badgers. There is also the risk of badgers accessing construction areas. The mitigation measures designed into the Project would be implemented to ensure that no badgers were harmed during the construction phase.
- 9.9.106 Implementation of these best-practice measures would ensure that any impact on the badger population, which is of local value, during construction would be negligible. This would result in a **negligible** effect.

Otter

- 9.9.107 No signs of otters have been confirmed within the Project site boundary, but they are known to be present within the wider area and there is potential for them to utilise the River Mole. The river corridor would be monitored regularly prior to, and during the diversion of the river and the construction of the new channel connecting to the Museum Field and East of Museum Field flood compensation areas, to detect any otter presence and to inform whether mitigation was required.
- 9.9.108 Implementation of best-practice methods for pollution prevention (to be secured via the CoCP) would ensure that all impacts to and effects on otters, should they be present in the wider catchments, would be negligible. This would give rise to a **negligible** effect to a receptor of local value.

Bat Assemblage

- 9.9.109 The works due to be undertaken between 2024 and 2029 would result in the loss of a range of habitats suitable for foraging, commuting and roosting bats across the Project site.
- 9.9.110 Sections of broadleaved woodland and an area of marshy grassland would be lost due to the diversion of the River Mole corridor and the siting of the airfield satellite contractor compound south of Brockley Wood. The levels of bat activity recorded in the south of Brockley Wood were very high (a total of 41,710 bat passes) compared to other areas of the site, including the next nearest static survey location, which recorded 3,886 bat passes on land west of the River Mole (approximately 250 metres from Brockley Wood).

- 9.9.111 The Project has the potential to significantly reduce levels of bat activity in this area, but mitigation measures designed into the Project seek to reduce this potential impact. A 15 metre buffer between Brockley Wood and the construction compound/river diversion would ensure the high value habitats associated with Brockley Wood are protected. It would also retain a strip of habitat comprising woodland edge, scrub and grassland, which would aid in maintaining connectivity into the wider landscape from the south of Brockley Wood.
- 9.9.112 Overall, the works could result in a slight reduction in foraging habitat for the bat assemblage within this area due to the loss of marshy grassland; the higher value habitats in Brockley Wood would be retained and large areas of high value habitat would remain present within connecting areas along the Mole corridor (NWZ) to the west and north west of Brockley Wood. Therefore, there would not be a total loss of foraging habitat but there would be a long-term, low reduction until the new river corridor had been diverted and new habitats had established within it. In the longer term, this would result in higher value habitat than that present originally.
- 9.9.113 The airfield satellite construction compound would remain present until 2035 resulting in a continued reduction in grassland habitat. The compound would be designed to ensure no artificial lighting reached the woodland or the buffer around it. During construction and use of the compound, dust suppression measures would be used to prevent air borne dust from affecting the woodland.
- 9.9.114 The Project is considered unlikely to significantly affect habitat connectivity, as the area of high value habitat to the south of Brockley Wood is small and beyond it lie the lower value habitats associated with the airfield. A low number of bats were recorded commuting over the airfield, and it is likely that those bats would not be deterred by the presence of the compound. Brockley Wood would remain well connected to the River Mole and higher value habitats to the north and west.
- 9.9.115 The River Mole diversion and airfield satellite contractor compound would therefore result in the temporary, long-term loss of habitat in close proximity to Brockley Wood until the River Mole had been diverted and the compound was no longer required.
- 9.9.116 The works could therefore slightly reduce the amount of bat activity recorded in Brockley Wood due to the loss of habitat immediately south of it but as this loss is relatively small in the context of the wider landscape, and because habitat connectivity to the north and west is considered to be more important than to the south, the impact is considered to be no more than medium. The creation of the new river corridor would create new habitat of value to bats early in the Project period thereby minimising the effect.
- 9.9.117 The relocation of the fire training ground and new taxiways to the south of it would result in the loss of small areas of scrub and Pond A, which may be of some value to foraging bats but are considered to be lower value habitats. Their loss is therefore considered unlikely to significantly increase the effects on the bat assemblage present.
- 9.9.118 Habitat loss associated with the construction work in these areas would be compensated through planting hedgerows, scattered broadleaved trees and broadleaved woodland and creating neutral grassland throughout the mitigation area to the west of the Mole corridor (NWZ) to strengthen connectivity and the value of the habitats in that area. Although there would be a temporary, long-term loss until new planting has established, the mitigation would reduce the duration of the adverse impact of habitat loss compared to restoring the compound site upon the completion of works in 2035. The mitigation would also provide an enhancement due to new, higher value

habitats being present and improved habitat connectivity to the west in addition to the restored river corridor once the River Mole had been diverted.

- 9.9.119 The creation of the Museum Field and East of Museum Field flood compensation areas would also enhance the habitat suitability for foraging bats compared to the existing habitat and would also be well connected to the River Mole corridor.
- 9.9.120 Additional areas of semi-natural broadleaved woodland and broadleaved trees, along with areas of grassland would be lost in areas sited for new and replacement parking (including Pentagon Field and replacement Purple Parking at Crawter's Field), car parking and a hotel at existing Car Park H, Museum Field and East of Museum Field flood compensation areas and the construction of the noise mitigation feature. The loss would be small in comparison to the overall larger woodland areas. However, their absence would have a small adverse impact on the bat assemblage using these areas for foraging and commuting between sites.
- 9.9.121 New decked parking at Pentagon Field would introduce artificial lighting to an area that is currently unlit. There would be an increased risk of artificial light spill onto the habitats within the woodland buffers and the woodland at the height of the new deck. This would be mitigated for through the design of an appropriate lighting scheme that directs lighting into the car park and limits light spill onto the surrounding area.
- 9.9.122 The construction of the North Terminal Long Stay decked car park, relocated CARE facility/replacement motor transport facility/relocation of Rendezvous Point North would result in the loss of some small areas of woody vegetation where treelines and scrub form linear features within areas of hardstanding. The relatively low value of these areas to bats for foraging and commuting, due to the dominance of hardstanding, means their loss would have a low impact on the bat assemblage present.
- 9.9.123 The implementation of suitable mitigation measures would ensure that any impact due to habitat loss to the south of Brockley Wood, and habitat loss resulting from the other works areas described above, on the bat assemblage within this part of the site, which is of local value, would be no more than a long-term medium impact. This would result in a **minor adverse** effect.
- 9.9.124 The siting of the South Terminal surface access satellite contractor compound in the north east of the Project site would result in the loss of a small amount of broadleaved plantation woodland, which is suitable habitat for foraging and commuting bats.
- 9.9.125 There would be a gap approximately 10 metres wide in the existing near continuous linear strip of woody vegetation during the period 2024 to 2029. There are existing gaps of a similar or larger size where the B2036 and the mainline railway cross and therefore a new gap is considered unlikely to significantly deter bats foraging and commuting in this area from crossing it. Surveys completed during the latter half of 2020 suggest this area is not used by significant numbers of bats. However, an assessment will be provided in the ES once surveys are completed in 2021.
- 9.9.126 In 2029, the improvements to the South Terminal roundabout would result in the loss of a large amount of broadleaved plantation woodland to the north and south of the roundabout and road, plus sections of species-poor hedgerow with trees, which are suitable for foraging and commuting bats. Replacement native, broadleaved woodland and hedgerow planting would be undertaken upon completion of the highway improvements to compensate for this loss. However, it would take time for any planting to establish. Surveys completed during the latter half of 2020 suggest

this area is not used by significant numbers of bats. However, a full assessment will be provided in the ES once surveys are completed in 2021.

- 9.9.127 The improvements to the North Terminal roundabout would result in the direct loss of a small amount of semi-natural broadleaved woodland along the A23 adjacent to the southern boundary of Riverside Garden Park and the loss of a large area of broadleaved plantation woodland to the south of the road. This would result in a reduction in foraging habitat for bats and reduced habitat connectivity from east to west and from north to south through widening the size of the gap between the northern and southern sides of the road, which could affect commuting behaviour.
- 9.9.128 The majority of the woodland to the north of the new road alignment would be retained. This would ensure a substantial amount of the existing woodland remains present within Riverside Garden Park and that the area along the Gatwick Stream, where the highest levels of bat activity were recorded, would be least affected.
- 9.9.129 This would also maintain habitat connectivity from east to west through Riverside Garden Park although it could be reduced to the south due to the loss of plantation woodland.
- 9.9.130 This would be in addition to the habitat connectivity that would be lost to the east due to vegetation clearance associated with improvements to the South Terminal roundabout.
- 9.9.131 The mitigation measures designed into the Project to protect retained woodland and recreate woodland once the new highway alignment is complete would ensure the effects would be temporary. However, they would be long-term due to the time it would take for new habitats to establish and mature.
- 9.9.132 Surveys partially completed in this area during 2020, including crossing point work, found that the habitat around the River Mole corridor is the most sensitive for bats, with the highest levels of activity. These surveys will be completed in 2021 and an assessment of effects made in the ES.
- 9.9.133 However, due to the amount of time needed for new woodland to establish sufficiently to compensate for the loss, it is likely that the combined effect of the loss of woodland, hedgerow and scrub along both sides of the A23 London Road would result in a long-term, high magnitude impact on a receptor of local value resulting in a **moderate adverse** significance of effect.
- 9.9.134 Once new woodland has established, this would represent new foraging habitat and connectivity would be restored, which would result in a long-term, **negligible** impact resulting in a **negligible** significance of effect.
- 9.9.135 The remainder of the pre-construction activities undertaken between 2024-2029 would not result in an adverse impact on the bat assemblage present, above those which have already been identified.

Bat Assemblage – Bechstein’s Bat and Barbastelle

- 9.9.136 The radio-tracking surveys identified that Museum Field (and surrounding area), the adjacent River Mole corridor (NWZ) and Brockley Wood were used as core foraging areas for multiple Bechstein’s bats. During bat activity surveys, barbastelle bats were recorded in the southern section of Brockley Wood and in woodland to the west of the fire training ground. Bechstein’s bats were also recorded flying over the runway in the west of the Project site.

- 9.9.137 Construction works in these areas would impact on the bats foraging and commuting in this area through habitat loss and disturbance. The diversion of the River Mole and the airfield satellite contractor compound would reduce habitat suitability and connectivity to the south of Brockley Wood. However, mitigation measures to protect the wood and maintain a 15 metre buffer along it would ensure bats could continue to commute into the wider landscape, including to the south. The completion of the River Mole diversion in 2025 would result in high value habitat establishing. Further grassland habitat would be created resulting in an enhancement to the habitat availability south of Brockley Wood.
- 9.9.138 The Museum Field flood compensation area would be constructed within the existing field and would not disturb the boundary woodland and trees, other than a small channel connecting it to the east. Therefore, the habitats utilised by bats in this area would be retained, reducing any impact construction works would have on the Bechstein's bat population.
- 9.9.139 Through the construction and operation of alterations to Taxiway Juliet and associated spur, there is a greater risk of bat mortality due to collision with aeroplanes and associated turbulence. However, the new spur would not be in constant use and aeroplanes using it would not be travelling at speed, therefore increased exposure to the risk of collision would be intermittent and not constant.
- 9.9.140 The mitigation and enhancement measures to the west of Brockley Wood would significantly improve the value of this habitat for bats by improving connectivity between roosting and foraging areas. This would be particularly beneficial for the Bechstein's bat populations to the west of the Project site. Although there would be a temporary, long-term loss until new planting has established, the mitigation would also reduce the scale and intensity of impacts on bat populations as a result of temporary habitat severance.
- 9.9.141 The activities associated with the construction of new and replacement car parks, the reconfiguration of airport facilities and noise mitigation features would be likely to have an adverse impact on Bechstein's bats through the removal of small areas of broadleaved woodland and broadleaved trees. Bechstein's bats were recorded along the southern boundary of the Project site and a roost was also recorded in Crawler's Wood. The roost would not be directly affected but bats using it could be affected by the small loss of woodland nearby.
- 9.9.142 Barbastelles were recorded in low numbers using habitats in the west of the Project site, near to the existing fire training ground and on the western edge of Crawler's Field. The additional Purple Parling at Crawler's Field would reduce the amount of foraging habitat in this part of the Project site but the retention of a woodland strip and additional habitat creation to the east would ensure habitat connectivity is retained.
- 9.9.143 The construction activities in the east of the Project site associated with new car parking have the potential to impact on Bechstein's bat and barbastelle, particularly as Bechstein's bat have been recorded foraging and roosting in Upper Pickett's Wood, Lower Pickett's Wood, Horleyland Wood and the surrounding landscape, which also recorded high activity levels from other bat species.
- 9.9.144 The loss of small areas of broadleaved woodland and trees from these areas would be compensated for in the overall planting strategy for the sites and new lighting regimes would be designed to prevent light spill onto adjacent higher value habitats.

- 9.9.145 As discussed in the section above, woodland planting would be undertaken early in the Project programme to compensate for the loss of suitable habitat, and therefore the impact on Bechstein's bat and barbastelle in these areas is likely to be temporary and localised within areas of less suitable habitat, compared to those found in the north west of the Project site and within the wider landscape. Additionally, mitigation measures designed into the Project would ensure a 15 metre buffer is retained and protected along the boundary of Lower Picketts Wood and the woodland within Pentagon Field to protect it.
- 9.9.146 A substantial amount of habitat loss would occur from the construction of the South Terminal surface access satellite contractor compound and South Terminal improvement works. Bechstein's bats were not recorded using these areas during radio-tracking surveys in 2019, however it is possible that they would utilise the habitat along the M23 for commuting to other foraging and roosting habitat within the wider area, as the woodland forms an east-west habitat corridor along the northern and southern boundaries of the existing South Terminal roundabout, M23 and Airport Way. Further surveys will be undertaken to determine the use of these areas by Bechstein's bat and barbastelle and will be reported in the ES.
- 9.9.147 A Bechstein's bat was recorded using habitats within Riverside Garden Park. The majority of the habitats in the park would be retained with the exception of a narrow strip where it borders the A23 road to the south which would be lost to the North Terminal roundabout improvements. The home range of the bat was found to also include habitats in the west of the Project site along the River Mole. The loss of habitat as a result of the improvement works would reduce habitat connectivity between these two areas due to the loss of woodland habitats between them. Bechstein's bats have been recorded crossing large areas of lower suitability habitats within the Project site and therefore bats may continue to cross this area but there is potential for them to be deterred by the large open space and lack of vegetation cover.
- 9.9.148 The North Terminal roundabout improvements have been designed to retain woodland vegetation along the Gatwick Stream, which would ensure a dark, well vegetated corridor would be retained connected to the River Mole corridor (NWZ). This would ensure that a suitable foraging and commuting route would be retained between the two areas.
- 9.9.149 In the long-term, new woodland planting along the new road alignment would create new areas of foraging habitat for Bechstein's bats and restore habitat connectivity to a level similar to that currently present. The area of woodland due to be lost is considered to be of lower value to Bechstein's bats compared to the habitats in the east and west of the site, which would be retained and enhanced. Due to the time it would take for new habitats to establish and mature, there would be a long-term, low impact on the Bechstein's bat population present.
- 9.9.150 Given that very low numbers of barbastelles were recorded, the Project site is considered unlikely to provide a key area of habitat for the local population. The medium to long-term loss of foraging habitat would be relatively small given the amount of suitable habitat within the wider area. The new habitat creation proposed in the west of the Project site would provide a larger area of higher value habitat than that due to be lost.
- 9.9.151 The remainder of the activities undertaken between 2024-2029 would not result in an adverse impact on Bechstein's bat or barbastelle, above those which have already been identified. With the mitigation measures proposed, the long-term impacts on Bechstein's bat and barbastelle, which are of county value, would be low resulting in a **minor adverse** effect.

Harvest Mouse

- 9.9.152 Harvest mouse has been recorded within the drier grassland associated with the River Mole corridor (NWZ). Parts of the suitable habitat for harvest mouse would be affected by the Project temporarily during the construction phase but the majority of areas would be retained. Post construction, suitable habitats would be restored and new habitats would be created.
- 9.9.153 This would result in a medium-term, low impact to a receptor of local value followed by a long-term, low beneficial impact due to the creation of new habitats resulting in a **negligible** effect.

Hedgehog

- 9.9.154 Hedgehog has been recorded within the Project site boundary. Areas of suitable habitat for hedgehog would be affected by the Project temporarily and permanently during the construction phase, including woodland, grassland and hedgerows, but further areas would be retained. Post construction, areas of suitable habitats would be restored.
- 9.9.155 This would result in a medium-term, low impact to a receptor of local value resulting in a **minor adverse** effect.

Terrestrial Invertebrate Assemblage

- 9.9.156 The key areas of the Project site with respect to terrestrial invertebrates include the two Gatwick biodiversity areas – the LERL and NWZ. Other incidental areas of higher value (including the bunding around the Fire Training Area and Pentagon Field) are also present. The scheme has been designed to retain the areas of highest value for terrestrial invertebrates, including the bunding to the south of Brockley Wood and edge habitat around Pentagon Field.
- 9.9.157 Both of the biodiversity areas would be affected by flood compensation works during the construction phase with the temporary loss of areas of semi-improved grassland. Other areas of habitat loss (mainly grassland but also areas of scrub) will occur within Pentagon Field to allow the construction of new car parking and alterations on the airfield to the existing Northern Runway and reconfiguration of the taxiways.
- 9.9.158 The land in the LERL will be re-instated post construction while the creation of the River Mole diversion will provide an overall increase in habitat of value to invertebrates.
- 9.9.159 This habitat loss would result in a medium-term, medium adverse impact to a receptor of county value resulting in a **moderate adverse** effect. This would be followed by a long-term, low beneficial impact due to the creation of new habitats resulting in a **minor beneficial** effect.

Shining Ramshorn Snail

- 9.9.160 Although not located during the surveys, records of this species from the River Mole have been recorded for the area around Gatwick. Therefore, it is possible it may be present. Works to realign the River Mole will be undertaken offline from the existing water course while the areas of flood compensation to be created between the river and the Museum Field will result in temporary loss of habitat for this species. Decreases in water quality due to pollution from fuel spillages or changes in sedimentation will be managed during the construction phase, as set out in the CoCP.

9.9.161 The habitat loss associated with the construction works will be followed by an overall increase in the area of habitat available for this species with the alterations to the course of the River Mole increasing the length of habitat available.

9.9.162 This habitat loss would result in a medium-term, low adverse impact to a receptor of local value resulting in a **minor adverse** effect. This would be followed by a long-term, low beneficial impact due to the creation of Mole diversion resulting in a **negligible** effect.

Fish

9.9.163 Both the Gatwick Stream and River Mole were found to support good populations of fish. Other than a small area of bank lowering to connect the new flood compensation land to the watercourse, no direct works to the Gatwick Stream are proposed and it is anticipated that works on the diversion of the Mole would be undertaken offline to minimise any impact to the river, including fish. Decreases in water quality due to pollution from fuel spillages or changes in sedimentation will be managed during the construction phase, as set out in the CoCP.

9.9.164 Once created, the diverted Mole is expected to have improved flow characteristics and associated higher oxygen levels. As such, the impact of the new habitat creation during the construction phase on fish is expected to be long-term, low beneficial resulting in a **negligible** effect.

Further Mitigation

9.9.165 The assessment is based on the maximum design scenario and, as such, assumes all habitats would be lost within the boundary of each development plot except where specific planting plans form part of the current design.

9.9.166 The maximum construction area required for the highways will be reviewed further throughout the EIA and design process, with a view to minimising this loss and retaining a linear strip of trees and shrubs to help retain habitat connectivity where practicable. Should this not be possible, opportunities to undertake additional tree and shrub planting would be sought prior to highways work commencing, to create a new east to west green corridor in the north of the site that connects to retained habitats.

Future Monitoring

9.9.167 Monitoring for bats, badgers, GCN and reptiles would be required during the construction phase, after species have been translocated and new habitats created.

9.9.168 Monitoring for otters and badgers would be required prior to and during construction.

Significance of Effects

9.9.169 The proposed monitoring would be undertaken as part of the Project; therefore, the significance of effects would remain as presented above.

2030-2032

9.9.170 The northern runway would be operational in 2029 and construction activities would continue during the period 2030 to 2032. This would include the further reconfiguration of taxiways, stands and other airport facilities, the extension of terminals and internal access alterations within the airport boundary. The habitats within these areas are predominantly low value and most potential

impacts on habitats or species would have already occurred in the period 2024 to 2029 and are assessed in the section above. Any potential effects from works undertaken during this period are considered in this section.

- 9.9.171 Works to the Longbridge roundabout and the construction of the Longbridge roundabout satellite contractor compound would commence during this period and the potential effects on ecology are discussed in this section. The construction of the North and South Terminal roundabout improvements would continue through this period and compounds for both roundabouts would continue to be operational. Vegetation clearance would have occurred in 2029 and the effects of habitat loss are assessed in the previous section.
- 9.9.172 Works comprising the construction of car parks, offices and hotels at Car Parks H and Y and North Terminal Long Stay decked car park would continue between 2030 and 2032. Any habitat clearance from these areas would have already been undertaken in the period 2024 to 2029 and is assessed in the section above. However, there is potential for further effects from the ongoing construction works which are assessed in this section.

Statutory Designated Sites

- 9.9.173 Due to the distance of the statutory designated sites from the Project site boundary, and the mitigation measures designed into the Project to ensure possible pollutants are prevented from reaching them, the construction of the Project would continue to have no impact on statutory designated sites. There would be no effect due to loss or alteration to the habitats or species present. The magnitude of impact and significance of effect would be **no change**.
- 9.9.174 The altered northern runway would be fully operational by 2029, resulting in an increase in flights and an increase in vehicles accessing the airport during this assessment period. This in turn would increase airborne emissions.
- 9.9.175 Changes to air quality arising from emissions can impact habitats and the animals/plants they support through direct toxicity and through indirect effects such as eutrophication of the soil and associated changes in species composition. Operational emissions have been modelled following standard good practice guidelines at a selection of discrete receptor points at the closest point of the statutory designated sites within 5 km of the Project (see Chapter 13: Air Quality and associated appendices for full details and results).
- 9.9.176 For the 2032 interim assessment year, the predicted nitrogen oxides (NO_x) concentration is below the critical level set for vegetation (30 µg.m⁻³) both without and with the Project at all modelled points around the statutory designated sites. On this basis, therefore, no changes due to air quality to receptors of national value are predicted. The magnitude of impacts and significance of effects would be no change.
- 9.9.177 Changes to air quality at sites beyond the 5 km buffer around the Project site may occur through emissions from increased vehicle movements associated with surface access to the airport. Such sites are of international value and include the SPAs and SACs described in Table 9.6.5. Modelling of emissions has been undertaken, based on the strategic traffic model created for the Project, with an interim assessment year of 2032 (see Chapters 13 Air Quality and 12 Traffic and Transport, and associated appendices for details).
- 9.9.178 For all sites considered, either the difference between the future baseline and 'with Project' scenario (the 'do nothing' and the 'do something' scenarios) is less than 1% of the relevant critical

load/level, or the total concentration/deposition does not exceed the relevant critical load/level. Where this is not the case, the only exceedances of 1% of the critical load/level are directly adjacent to the road within the road verge. None of the sites assessed have habitats or interest features that extend to the road verge. On this basis, therefore, no changes due to air quality to receptors of international value are predicted. The magnitude of impacts and significance of effects would be no change.

- 9.9.179 Full details of the assessment are provided in Appendix 9.9.1 Habitats Regulations Assessment Report.

Non-statutory Designated Sites

- 9.9.180 Horleyland Wood LWS is the nearest non-statutory site to works areas within the Project boundary but the works in closest proximity to it would have been undertaken prior to 2030.
- 9.9.181 The remaining non-statutory designated sites are more than 600 metres from the Project site boundary and therefore less sensitive to effects from construction.
- 9.9.182 Mitigation measures designed into the Project, including ensuring possible pollutants are prevented from reaching the non-statutory designated sites, would ensure the Project would have no impact upon them. There would be no effect due to loss or alteration to the habitats or species present. The magnitude of impact and significance of effect would be **no change**.
- 9.9.183 Further details of the effects of air quality on non-statutory designated sites will be provided in the ES.

Ancient Woodland

- 9.9.184 No new construction activities would start in close proximity to ancient woodlands in the period 2030 to 2032. The minimum 15 metre buffer would remain in place around Brockley Wood whilst the airfield satellite contractor compound remains operational through this period.
- 9.9.185 Mitigation measures designed into the Project to ensure that possible pollutants are prevented from reaching Brockley Wood would ensure the Project would have no impact upon it. This would result in no change to a receptor of regional value. The magnitude of impact and significance of effect would be **no change**.
- 9.9.186 An assessment of the effects of air quality on ancient woodland has been undertaken. For all areas of ancient woodland considered, either the difference between the 'do nothing' and the 'do something' scenarios is less than 1% of the relevant critical load/level, or the total concentration/deposition does not exceed the relevant critical load/level. Further details regarding air quality emissions are provided in Chapter 13: Air Quality and associated appendices.
- 9.9.187 This would result in no change to a receptor of regional value. The magnitude of impact and significance of effect would be **no change**.

Habitats

Semi-natural Broadleaved Woodland and Broadleaved Trees

- 9.9.188 Areas of semi-natural broadleaved woodland and individual broadleaved trees would be lost due to the construction of the Longbridge roundabout satellite contractor compound in 2030 and the start of works to the Longbridge roundabout in 2031. The largest area of woodland would be lost

to the east of the roundabout and bordering the River Mole and a small area of woodland would be lost to the south of the A23, also bordering the River Mole.

- 9.9.189 A small, approximately 10 metre wide, gap would initially be created in a line of trees to the north-east of the roundabout to provide access to the compound. The assessment assumes at this stage that the commencement of the roundabout works in 2031 would result in the loss of all trees within the Project site boundary to the north of the roundabout and along the A23 Brighton Road to the north-east. Broadleaved trees would also be lost from the area west of the roundabout and from on the roundabout.
- 9.9.190 As well as the direct loss of habitat, the loss of woodland and trees would result in a loss of habitat connectivity reducing the ability of flora and fauna to disperse across the landscape. This area connects to the North Terminal roundabout improvements works area to the east where a substantial amount of broadleaved plantation woodland and some semi-natural broadleaved woodland would have already been lost (prior to 2030). The Longbridge roundabout improvements would therefore further the extent of woody habitat loss and extend the loss in habitat connectivity.
- 9.9.191 Replacement native tree and shrub planting would be undertaken in late 2032 to compensate for the loss of habitat and to re-connect the severed habitat. Due to the lack of vegetation during the construction period and the time it would take new planting to establish, there would be a long-term loss of habitat and connectivity.
- 9.9.192 When the Longbridge roundabout improvements are considered in combination with the North and South Terminal roundabout improvements, the loss of woodland and trees would add to the long term, medium impact on a habitat of County importance previously assessed for the period 2024 to 2029. It would not result in any change to the **moderate adverse** significance of effect already determined.

Hedgerows

- 9.9.193 An intact species-poor hedgerow would be lost to construct Pier 7. To compensate for the loss of the hedgerow, new hedgerow would be planted along access roads in close proximity. This would replace the habitat lost and help retain habitat connectivity. The new hedgerow would be planted in advance of the existing hedgerow being lost.
- 9.9.194 Therefore, there would be a medium-term loss of hedgerow followed by a long-term increase in the length of hedgerow in this part of the site. This would result in an overall negligible impact on a hedgerow of County value resulting in a **negligible** effect.

Watercourses

- 9.9.195 Best practice measures to mitigate the ongoing construction impacts would continue to control the impacts on surface water resulting in no significant effects, as reported in Chapter 11: Water Environment.
- 9.9.196 Pollution control measures would limit any impacts during the improvements to the North and South Terminal roundabouts and the works to Longbridge roundabout. The surface water assessment in Chapter 11: Water Environment of this PEIR identifies that the roadworks would have impacts during construction, including increased suspended sediment concentrations and potential change to water quality. However, the overall effect would be negligible/minor adverse.

The impact on the ecology of the watercourse would therefore be negligible for the medium-term and would result in a **negligible** effect to a receptor of County value.

Ponds (NERC S.41 Habitat)

- 9.9.197 No ponds qualifying as a NERC S.41 Habitat would be directly impacted by the Project. Measures to protect habitats of value designed into the Project, including pollution prevention measures and the erection of study fencing around higher value habitats would ensure that no adverse effects occur. The magnitude of impact and significance of effect would be **no change**.

Ponds (not NERC S.41 Habitat)

- 9.9.198 Pond D would be affected by an increase of surface water draining into it. Pond D was found to be of low ecological value and therefore an increase in surface water would have a negligible impact on its ecology value. This long-term, negligible impact on a receptor of local value would result in a **negligible** effect.
- 9.9.199 A newly-created pond in the west of the site would be establishing and beginning to support a range of flora and fauna by 2030. This would increase the number and distribution of ponds within the Project site boundary and provide new and additional habitat for a range of flora and fauna. This would have a long-term, low beneficial impact to a receptor of local value resulting in a **minor beneficial** effect.

Semi-improved Neutral Grassland

- 9.9.200 No areas of semi-improved neutral grassland would be impacted by construction works undertaken during this phase of the Project. The magnitude of impact and significance of effect would be **no change**.

Marshy Grassland

- 9.9.201 No areas of marshy grassland would be impacted by construction works undertaken during this phase of the Project.
- 9.9.202 A new area of marshy grassland would already have been created in the west of the site, along the River Mole diversion and within the Museum Field and East of Museum Field Flood Compensation areas and would be establishing. This was previously assessed as having a long-term medium beneficial impact, resulting in a **minor beneficial** significance of effect.
- 9.9.203 However, any delays in the establishment of marshy grassland would result in a continued medium-term, low negative impact on a receptor of local value which would result in a **minor adverse** effect.

Broadleaved Plantation Woodland and Associated Scrub

- 9.9.204 No areas of broadleaved plantation woodland would be impacted by construction works undertaken during this phase of the Project. The magnitude of impact and significance of effect would be **no change**.

Flora: Bluebell and Pennyroyal

- 9.9.205 Relatively small areas of woodland would be affected given the overall resource within the Project site boundary. Mitigation measures to protect bluebell by collecting bulbs during the clearance of

woodland and replanting them within woodland planted in the mitigation area would ensure the long-term impact on bluebells, which are of local value, would be low. This would result in a **minor adverse** significance of effect.

- 9.9.206 The effects on pennyroyal as a result of improvements to the South Terminal roundabout are discussed in the above section for 2024 to 2029.

Flora: Lesser Quaking Grass, Narrow-lipped Helleborine, Ragged Robin and Solomon's Seal

- 9.9.207 No construction works are required within the locations where notable flora were identified. Measures to protect habitats of value from pollution events would ensure the plants were not affected. This would ensure there would be **no change** to the presence or distribution of the species due to the Project.

Breeding Birds (Annex 1 EU Birds Directive and/or listed under Schedule 1 of the WCA)

- 9.9.208 No Schedule 1 breeding birds were confirmed to be present and therefore no effects are currently foreseen. Further surveys will be undertaken to determine whether any Schedule 1 birds are breeding within the Project site boundary as a precaution prior to construction works commencing. Should Schedule 1 breeding birds be present, measures would be put in place to ensure they were not disturbed by any Project related work. This would include identifying appropriate buffers around the nest within which works that could lead to disturbance would be prohibited. The nests would also be closely monitored by suitably experienced ornithologists who would undertake dynamic risk assessments to ensure mitigation measures were altered to further reduce the risk of disturbance if necessary.

Breeding Birds (NERC Species of Principal Importance and BoCC Red or Amber listed species)

- 9.9.209 The works due to be undertaken from 2029 and beyond would result in the loss of habitats suitable for breeding birds across the Project site.
- 9.9.210 A hedgerow, which provides suitable habitat for breeding birds, would be lost as part of the construction of Pier 7. Prior to removal, and to compensate for the loss of the hedgerow, new hedgerow planting would be created along adjacent access roads, but this is unlikely to have established sufficiently to offer more than low value habitat. It is likely that birds utilising this hedgerow would be displaced to other areas of suitable habitat within the Project site boundary and therefore this would result in a low impact.
- 9.9.211 Works to Longbridge roundabout would result in the loss of a mature tree line, areas of semi-natural broadleaved woodland and scattered broadleaved trees. This would affect the breeding bird assemblage utilising this area and would account for a small additional loss of habitat in addition to the substantial habitat loss associated with improvements to the North and South Terminal roundabouts.
- 9.9.212 The works from 2030 to 2032 would result in an additional loss of suitable nesting sites for breeding birds in addition to the habitats lost between 2024 and 2029. New habitats would be establishing, and some would be at a stage suitable for supporting nesting birds within the wider Project site. However, there would continue to be an overall reduction in nesting sites for birds resulting in the continued medium-term, medium impact to a feature of County value resulting in a **moderate adverse** effect. In the long term, when new planting has fully established, there would be increased nesting opportunities resulting in a **minor beneficial** effect.

Wintering Bird Assemblage (including BoCC Red or Amber Listed Species)

- 9.9.213 The works due to be undertaken from 2030 to 2032 would predominantly be outside of the habitats identified as suitable for wintering birds across the Project site.
- 9.9.214 During surveys undertaken in 2018 and 2019, there were no wintering bird species recorded in any numbers which were considered to be of national or international significance. The overall long term impacts from loss of foraging habitat during construction from 2030 to 2032 within the Project site boundary would be negligible on a receptor of local value resulting in a **negligible** effect.

Grass Snake

- 9.9.215 Grass snake would not be affected by construction activities being undertaken at this stage of the Project. The magnitude of impact and significance of effect would be **no change**.

Great Crested Newt

- 9.9.216 Great crested newt would not be affected by construction activities being undertaken at this stage of the Project. The magnitude of impact and significance of effect would be **no change**.

Common Toad

- 9.9.217 The construction activities being undertaken at this stage of the Project would have a limited impact on habitats suitable for common toad and would be unlikely to have any impact on the overall population. The magnitude of impact and significance of effect would be **no change**.

Badger

- 9.9.218 A main badger sett would have been closed to allow earlier aspects of the Project to be constructed. An artificial sett would have been created within the badger social group's territory. Ongoing monitoring would have determined whether the badger social group had successfully moved to the artificial sett and any necessary remedial works would have been implemented.
- 9.9.219 New habitats would have been created around the artificial sett, increasing the foraging resource for badgers. By 2030, there would be no impacts on the new sett and habitat creation resulting in no effect on the badger sett.
- 9.9.220 The continued increase in construction traffic and associated movements in areas around setts on-site would mean that there would be the potential for a corresponding increase in road mortality for badgers using the site. However, it is not expected that badger movement (principally at night) and construction would overlap significantly. There is also the risk of badgers accessing construction areas. The mitigation measures designed into the Project would be implemented to ensure that no badgers were harmed during the construction phase.
- 9.9.221 There would be more operational traffic on the roads around the airport. However, the minor roads nearest to the setts which badgers are most likely to cross are unlikely to receive substantial increases in traffic. Impacts from increased traffic on more major roads at a greater distance from the setts are considered less likely as badgers would disperse within the wider area in lower numbers or less frequently.

9.9.222 The implementation of best-practice measures during construction would ensure that any impact on the badger population, which is of local value, during construction would be negligible. This would result in a **negligible** effect.

Otter

9.9.223 No signs of otter have been confirmed within the Project site boundary, but they are known to be present within the wider area and there is potential for them to utilise the River Mole and Gatwick Stream. The river corridors would be monitored regularly prior to and during the construction of the Longbridge roundabout satellite contractor compound and the Longbridge roundabout improvements to ascertain whether mitigation was required.

9.9.224 Implementation of best-practice methods for pollution prevention (to be secured via the CoCP) would ensure that such impacts and effects on otters, should they be present in the wider catchments, would be negligible.

9.9.225 An area of semi-natural broadleaved woodland would be cleared to the east of the roundabout which borders the River Mole. The loss of the woodland would result in less screening of the river channel and it becoming less secluded which could have an effect on otter behaviour resulting in them being deterred from crossing the open area, particularly when levels of disturbance were high from construction activities.

9.9.226 The compound would be located adjacent to the River Mole, which would also increase the risk of disturbance to otters from human activity and increased artificial lighting. Otters could be deterred from accessing part of their territory which could impact their availability to food and ability to breed.

9.9.227 However, given that otter have not been recorded within the Project site and that the section of river that would be affected would account for a small part of an otter's wider territory, the impact would be low. This would give rise to a **minor adverse** effect on a receptor of County value.

Assemblage of Bat Species

9.9.228 Works to Longbridge roundabout would result in the loss of a mature tree line north of the roundabout and an area of semi-natural broadleaved woodland east of the roundabout, which forms a continuation of the habitat corridor west of Riverside Garden Park and would therefore further reduce habitat connectivity and result in the loss of suitable foraging habitat. New planting would be undertaken in 2032 at the end of the works and at the same time as replacement planting around the North Terminal roundabout improvements but until it has matured there would be a long-term loss of foraging habitat and connectivity.

9.9.229 When considered in combination with the North and South Terminal roundabout improvements, the works to the Longbridge roundabout would result in a continued long-term, high impact on the bat assemblage, which is of local value, resulting in a continued **moderate adverse** effect until new planting is sufficiently mature to compensate for the loss of foraging and commuting habitat.

9.9.230 Once new planting has established and matured along all the highway improvement areas, the amount of available foraging habitat would be similar to current areas but of higher value. Habitat connectivity would be restored. The impact of the works would then be low and long-term resulting in a **minor beneficial** effect.

- 9.9.231 In the period 2030 to 2032, work would continue within Car Parks H and Y and in the North Terminal Long Stay decked car park. The vegetation within these areas would have already been cleared in the period 2024 to 2029 but works to construct decked parking, hotels and offices would continue into 2030 to 2032.
- 9.9.232 This would result in the potential for increased light spill onto retained habitats around the periphery of these locations and light spill from an increased height. Car Park Y and the North Terminal Long Stay decked car park border the higher value habitats for bats along the River Mole corridor and therefore there would be a risk of increased light spill onto the river corridor affecting bat activity. External lighting of car parks and hotels would be designed to prevent light spill from reaching the river corridor to mitigate this effect.
- 9.9.233 An intact species-poor hedgerow would be lost to construct Pier 7. To compensate for the loss of the hedgerow, new hedgerow would be planted along access roads in close proximity. This would replace the foraging habitat lost and help retain habitat connectivity for commuting bats. The new hedgerow would be planted in advance of the existing hedgerow being lost.
- 9.9.234 The hedgerow is within an area dominated by hardstanding associated with roads, car parking and the airfield so the overall value of the area for bats is considered to be relatively low.
- 9.9.235 This would result in a long-term, negligible impact on the bat assemblage resulting in a **negligible** significance of effect.

Bats (Bechstein's and Barbastelle Bats)

- 9.9.236 Bechstein's bat was recorded using habitats within Riverside Garden Park. The majority of the habitats in the park would be retained but the improvements to the Longbridge roundabout would result in the loss of semi-natural broadleaved woodland along the River Mole corridor to the west of the park. The home range of the bat was found to also include habitats in the west of the Project site along the River Mole. The loss of habitat as a result of the improvement works would reduce habitat connectivity between these two areas due to the loss of woodland habitats between them. Bechstein's bats have been recorded crossing large areas of lower suitability habitats within the Project site and therefore bats may continue to cross this area but there is potential for them to be deterred by the large open space and lack of vegetation cover.
- 9.9.237 In the long-term, new woodland planting along the new road alignment would create new areas of foraging habitat for Bechstein's bats and restore habitat connectivity to a level similar to that currently present. The area of woodland due to be lost is considered to be of lower value to Bechstein's bats compared to the habitats in the east and west of the site, which would be retained and enhanced.
- 9.9.238 Due to the time it would take for new habitats to establish and mature, there would be a long-term, low impact on the Bechstein's bat population present which is of County value, resulting in a **minor adverse** effect.

Harvest Mouse

- 9.9.239 In 2030, new areas of semi-improved neutral grassland would have been created within the mitigation area in the west of the site to compensate for the loss of habitat during construction and to create new areas of suitable habitat. The Project would therefore have a long-term low

beneficial impact on Harvest Mouse (a receptor of local value) resulting in a **minor beneficial** effect.

Hedgehog

- 9.9.240 Areas of the suitable habitat for hedgehog would be affected by the Project temporarily and permanently during the construction phase, including woodland, grassland and hedgerows, particularly habitats affected by the Longbridge roundabout improvements and Longbridge roundabout satellite compound. Some of the habitats lost in the earlier phase of construction work; associated with road improvements and construction of car parks and hotels, would yet to have been re-instated but further areas would be retained within the wider Project boundary. Post construction, areas of suitable habitats would be restored and new areas of suitable habitat would be established within the mitigation area in the west of the site.
- 9.9.241 In the long-term, there would be a low beneficial impact to a receptor of local value resulting in a **minor beneficial** effect.

Terrestrial Invertebrate Assemblage

- 9.9.242 By 2030, the new areas of flood compensation would have been created and would be establishing. No further works to areas that might support terrestrial invertebrate assemblages of conservation interest are proposed in this period. This would result in the same long-term, low beneficial impact and **minor beneficial** effect identified previously.

Shining Ramshorn Snail

- 9.9.243 By 2030, the new River Mole diversion would have been created and would be establishing. No further works to areas that might support this species are proposed in this period. On-going implementation of pollution and sediment control measures (described in the CoCP) would ensure water quality is maintained. This would result in the same long-term, low beneficial impact and **negligible** effect identified previously.

Fish

- 9.9.244 By 2030, the new River Mole diversion would have been created and would be establishing. No further works to areas that might support fish are proposed in this period. Ongoing implementation of pollution and sediment control measures (described in the CoCP) would ensure water quality is maintained. This would result in the same long-term, low beneficial impact and **negligible** effect identified previously.

Further Mitigation

- 9.9.245 The assessment is based on the maximum design scenario and, as such, assumes all habitats would be lost within the boundary of each development plot shown except where specific planting plans form part of the current design. The extensive loss of the existing habitats to allow the Longbridge highway improvements would have a significant effect due to the loss of woodland and scrub that would remove a green corridor and reduce habitat connectivity. This would also result in a significant loss of nesting sites for breeding birds and foraging and commuting routes for bats and otters.
- 9.9.246 The maximum construction area required for the highways will be reviewed throughout the EIA process, with a view to minimising this loss and retaining a linear strip of trees and shrubs to help

retain habitat connectivity where practicable. Should this not be possible, opportunities to undertake additional tree and shrub planting would be sought prior to highways work commencing, to create a new east to west green corridor in the north of the site that connects to retained habitats.

Future Monitoring

- 9.9.247 Monitoring for otters and badgers would be required prior to and during construction.
- 9.9.248 Continued monitoring of the populations of bats, GCN and grass snake would be required to determine the success of the mitigation implemented.
- 9.9.249 Monitoring of any habitat creation would also be required to determine its success and to inform whether any remediation works were required.

Significance of Effects

- 9.9.250 The proposed monitoring would be undertaken as part of the Project. Therefore, the significance of effects would remain as presented above.

2033-2038

Ongoing Construction Activities

- 9.9.251 In the period 2033 to 2038, construction activities would include phase 2 to Car Park Y and the creation of the Gatwick Stream flood compensation area. Any effects on ecology and nature conservation from the works in Car Park Y would have occurred in previous years and have already been assessed.
- 9.9.252 There would be no new effects from any construction activities that were started prior to 2033 but continue through this period that have not been assessed under the previous section of this chapter (2030-2032).

Statutory Designated Sites

- 9.9.253 Construction activities would continue in 2033. Due to the distance of the statutory designated sites from the Project site boundary, and the mitigation measures designed into the Project to ensure possible pollutants are prevented from reaching them, the construction of the Project would continue to have no impact on statutory designated sites. There would be no effect due to loss or alteration to the habitats or species present. The magnitude of impact and significance of effect would be **no change**.
- 9.9.254 Changes to air quality through emissions of various chemical species can impact habitats and the animals/plants they support through direct toxicity and through indirect effects such as eutrophication of the soil and associated changes in species composition. Operational emissions for 2038 will be modelled following standard good practice guidelines at a selection of discrete receptor points at the closest point of the statutory designated sites within 5 km of the Project to confirm the findings presented above for 2032 (which is anticipated to be the worst case effect). Results of this further confirmatory modelling will be presented in the ES.

Non-statutory Designated Sites

- 9.9.255 The Gatwick Stream flood compensation area would be located approximately 375 metres south of Horleyland Wood LWS. The Project would involve the excavation of existing ground levels to create flood attenuation basins.
- 9.9.256 The remaining non-statutory designated sites are more than 600 metres from the Project site boundary and therefore less sensitive to effects from construction.
- 9.9.257 Mitigation measures designed into the Project, including ensuring possible pollutants are prevented from reaching the non-statutory designated sites, would ensure the Project would have no impact upon them. There would be no effect due to loss or alteration to the habitats or species present. The magnitude of impact and significance of effect would be **no change**.

Ancient Woodland

- 9.9.258 The potential impacts and the measures to protect the ancient woodland in Horleyland Wood and Lower Picketts Wood are described above for non-statutory designated sites. These would ensure the creation of the flood compensation area to the east of Gatwick Stream would result in no impacts from contamination, most notably from dust.
- 9.9.259 The airfield satellite contractor compound would be operational until 2035, in close proximity to Brockley Wood.
- 9.9.260 Mitigation measures designed into the Project ensuring possible pollutants are prevented from reaching Brockley Wood would ensure the Project would have no impact upon it. This would result in **no change** to a receptor of regional value.
- 9.9.261 An assessment of the effects of air quality on ancient woodland will be included in the ES.

Habitats

Semi-natural Broadleaved Woodland and Mature Broadleaved Trees

- 9.9.262 No new areas of semi-natural broadleaved woodland or mature broadleaved trees would be affected by construction activities being undertaken at this stage of the Project. The trees around the margins of the Gatwick Stream flood compensation area would be protected throughout the construction period by standard tree protection measures. The magnitude of impact and significance of effect would be **no change**.

Hedgerows

- 9.9.263 No new hedgerows would be affected by construction activities being undertaken at this stage of the Project. The magnitude of impact and significance of effect would be **no change**.

Watercourses

- 9.9.264 A short section of the Gatwick Stream measuring approximately 55 metres long would be affected by the creation of a spillway along its eastern bank to connect it to the flood compensation area to the east of Gatwick Stream. This would result in the loss of the existing bank and the creation of a gentler slope. The slope would develop into wetland or grassland habitat of an equal value to the existing bankside habitat.

- 9.9.265 There would be a long-term loss of bankside habitat before new vegetation has established but this would affect a very short section of the stream and therefore the overall impact would be low. This would result in long-term, low impact to a receptor of County value resulting in a **minor adverse** significance of effect.

Broadleaved Plantation Woodland and Associated Scrub

- 9.9.266 An area of relatively young broadleaved plantation woodland would be lost during the construction of the Gatwick Stream flood compensation area due to the need to reduce existing ground levels by up to 3 metres. The woodland is located close to the stream corridor where the connection from the flood compensation area to the stream would be made. The creation of new areas of broadleaved woodland within the wider Project boundary would compensate for this loss.
- 9.9.267 There would be a long-term loss during construction and until new planting has reached the maturity of the trees that have been lost. There would be an overall, long-term, low loss in the amount of woodland, of local value, resulting in a **minor adverse** effect.

Semi-improved Neutral Grassland

- 9.9.268 Areas of semi-improved neutral grassland would be lost during the construction of the Gatwick Stream flood compensation area. There would be a long-term loss during construction with areas at the top of banks within the flood compensation area being returned to semi-improved neutral grassland upon completion. There would be an overall, long-term, small loss in the amount of semi-improved neutral grassland.
- 9.9.269 New areas of semi-improved neutral grassland would have been created within the flood compensation area and the mitigation area in the west of the site by this time. This would compensate for the loss of the semi-improved neutral grassland cleared for the flood compensation area to the east of Gatwick Stream. There would therefore be a negligible, long-term impact on this habitat of local value resulting in a **negligible** effect.
- 9.9.270 Any unforeseen delay in creating the grassland or failure in it establishing successfully resulting in the need for remedial works would delay the grassland reaching its desired outcome. This would therefore continue the medium term, low negative impact on a receptor of local value resulting in a continued **minor adverse** effect.

Marshy Grassland

- 9.9.271 The construction of the Gatwick Stream flood compensation area would further increase the area of marshy grassland present on the site above the pre-construction area once it has been constructed. This would result in a long-term low beneficial impact resulting in a **minor beneficial** significance of effect.
- 9.9.272 Any delays in the establishment of marshy grassland would result in a continued medium-term, low negative impact on a receptor of local value which would result in a **minor adverse** effect.

Species

Breeding Bird Assemblage (including NERC Species of Principal Importance and BoCC Red or Amber Listed species)

- 9.9.273 The majority of the suitable habitat for breeding birds that would be lost due to the Project would have been lost prior to 2033. In the period 2033 to 2038, the habitats created within mitigation areas early in the Project would be well developed with most (except woodland) having reached their desired maturity by 2038. Due to there still being a reduction in the amount of woodland habitat, there would still be an adverse impact on breeding birds.
- 9.9.274 An area of broadleaved plantation would be affected during the construction of the flood compensation area in the east of the Project site. However, the amount of habitat to be affected is relatively small compared to the overall habitats present within and immediately adjacent to the Project site boundary and therefore the impact on the breeding bird assemblage in this area would be negligible. This would have a **negligible** effect on a feature which is of County value.

Wintering Bird Assemblage (including BoCC Red or Amber listed species)

- 9.9.275 During surveys undertaken in 2018 and 2019, there were no wintering bird species recorded in any numbers which were considered to be of national or international significance. Furthermore, new planting undertaken in other parts of the Project site would be establishing and would provide alternative foraging habitats, therefore resulting in a negligible medium term impact on a receptor of local value which would have a **negligible** effect.

Grass Snake

- 9.9.276 The construction of the flood compensation area east of the Gatwick Stream would affect some peripheral habitats between woodland and grassland and the habitats along the Gatwick Stream corridor that could be used by the low population of grass snake present in this area. A translocation exercise would be undertaken to move grass snakes into existing retained habitat protected from construction areas prior to construction works affecting the existing habitat.
- 9.9.277 Due to the small area of suitable habitat that would be affected and the low population of grass snake present (which is of local value), this would have a negligible, medium term impact on the grass snake population present resulting in a **negligible** effect.
- 9.9.278 The creation of semi-improved neutral grassland and marshy grassland within the Gatwick Stream flood compensation area and along the banks of the realigned River Mole would create new, high value habitats for grass snake resulting in a long-term, low beneficial impact. This would have a **minor beneficial** effect.
- 9.9.279 Any failure of proposed habitat creation within these areas would result in a decrease in the expected extent of habitat for grass snakes. It is considered unlikely that there would be a complete failure of habitat creation and there would continue to be retained habitats within both areas where grass snake were recorded. Measures to remediate any failure would be put in place ensuring any impact was no more than medium-term. Therefore, this would result in a medium-term low impact on the grass snake population which was of local value, resulting in a **minor adverse** effect.

Great Crested Newt

- 9.9.280 A medium population of GCN was recorded in two closely located ponds in the east of the Project site within woodland near to Crawley Sewage Treatment Works. Parts of the Project site fall within 500 metres of the ponds.
- 9.9.281 A proposed flood compensation area would be located within 500 metres of the ponds within the biodiversity area (LERL). However, a large basin associated with the sewage works is present between the ponds and flood compensation area, which would present a barrier to GCN dispersal. It is likely that GCN would need to commute around the basin to reach this part of the site which would cover a distance of more than 500 metres. This would significantly reduce the likelihood of GCN being present.
- 9.9.282 A translocation exercise would be undertaken as a precaution within parts of the biodiversity area (LERL), and GCN would be moved to existing retained and protected habitat around the boundaries of the Flood Compensation Area or within habitats closer to the ponds.
- 9.9.283 Due to the distance of the affected habitats from the ponds, the number of GCN translocated is expected to be low. Therefore, the medium-term impacts would be low and the effects on the GCN population of local value would be **negligible**.

Common Toad

- 9.9.284 The semi-improved neutral grassland in the east of the site would be affected, resulting in a loss of habitat for common toad. This would account for a relatively small loss given the overall habitat resource within the Project site.
- 9.9.285 Newly created grassland habitats within the flood compensation areas and mitigation area in the west of the site would continue to increase the habitat resource for common toad resulting in a long term, low beneficial impact on a receptor of local value. This would result in an overall **negligible** effect.
- 9.9.286 The failure or delay in new areas of habitat establishing would have a medium term low negative impact which would also have a **negligible** effect.

Badger

- 9.9.287 No works would be undertaken within close proximity of the new badger sett.
- 9.9.288 The continued increase in construction traffic and associated movements in areas around setts on site would mean that there would be the potential for a corresponding increase in road mortality for badgers using the site. However, it is not expected that badger movement (principally at night) and construction would overlap significantly. There is also the risk of badgers accessing construction areas. The mitigation measures designed into the Project would be implemented to ensure that no badgers are harmed during the construction phase.
- 9.9.289 Implementation of these best-practice measures would ensure that any impact on the badger population, which is of local value, during construction would be negligible. This would result in a **negligible** effect.

Otter

- 9.9.290 No signs of otters have been confirmed within the Project site boundary, but they are known to be present within the wider area and there is potential for them to utilise the River Mole and Gatwick Stream. The river corridors would be monitored prior to and during the construction of the Gatwick Stream flood compensation scheme to detect any otter presence and to inform whether mitigation is required.
- 9.9.291 Implementation of best-practice methods for pollution prevention (to be secured via the CoCP) would ensure that all impacts to on otters, should they be present in the wider catchments, would be negligible. This would give rise to a **negligible** effect to a receptor of local value.

Assemblage of Bat Species

- 9.9.292 The majority of the bat activity recorded in the Gatwick Stream flood compensation area was associated with the mature tree lines and areas of woodland that border it. The flood compensation area has been designed to retain the majority of the tree lines within this area but there would be a loss of a small amount of plantation woodland. This would result in the very small loss of foraging habitat and would not be considered large enough to prevent bats from commuting to adjoining areas.
- 9.9.293 The overall long-term impact on the bat assemblage would therefore be negligible, resulting in a **negligible** effect.

Bats (Bechstein's Bat and Barbastelle Bat)

- 9.9.294 The creation of the Gatwick Stream flood compensation area would result in a small loss of broadleaved plantation. Bechstein's bat roosts were identified in woodland to the north and east of the proposed flood compensation area but no confirmed activity from Bechstein's bats was recorded within it. It is likely that Bechstein's bats would utilise the habitats present at times. The impact of losing a very small amount of foraging habitat is considered to be negligible in the long-term on the population, which is of County value. This would give rise to a **negligible** effect.

Hedgehog

- 9.9.295 Areas of suitable habitat for hedgehog would be affected by the Project temporarily and permanently during the construction phase, including a plantation woodland and grassland, but further areas would be retained, and the loss would account for a small part of the overall habitat resource. Post construction, areas of suitable habitats would be restored, and new areas of suitable habitat would be establishing within the mitigation area in the west of the site.
- 9.9.296 In the long-term, there would be a low beneficial impact to a receptor of local value resulting in a **minor beneficial** effect.

Terrestrial Invertebrate Assemblage

- 9.9.297 During this period, the new areas of flood compensation would have been created and would be establishing. No further works to areas that might support terrestrial invertebrate assemblages of conservation interest are proposed in this period. This would result in the same long-term, low beneficial impact and **minor beneficial** effect identified previously.

Shining Ramshorn Snail

- 9.9.298 During this period, the new River Mole diversion would have been created and would be establishing. No further works to areas that might support this species are proposed in this period. Ongoing implementation of pollution and sediment control measures (described in the CoCP) would ensure water quality is maintained. This would result in the same long-term, low beneficial impact and **negligible** effect identified previously.

Fish

- 9.9.299 During this period, the new River Mole diversion would have been created and would be establishing. No further works to areas that might support fish are proposed in this period. Ongoing implementation of pollution and sediment control measures (described in the CoCP) would ensure water quality is maintained. This would result in the same long-term, low beneficial impact and **negligible** effect identified previously.

Further Mitigation

- 9.9.300 The assessment is based on the maximum design scenario and as such assumes all habitats would be lost within the boundary of each development plot except where planting plans are currently included in the Project design.
- 9.9.301 It is considered that any additional mitigation required to remediate failures in habitat creation and/or protected species mitigation would have been rectified in the period 2030 to 2032 for habitats created in 2024 to 2029. If any additional mitigation were required for these areas in 2033 to 2038, it would be unlikely to be significant or on a large scale. Mitigation measures could be required to remediate failures in habitat creation resulting from the highways improvement works completed in 2030 and 2032.

Future Monitoring

- 9.9.302 In 2033 to 2038, the success of habitat creation and mitigation measures for bats, GCN and grass snake would continue to be monitored. The effects of success or failure would remain the same as those assessed previously.
- 9.9.303 Continued monitoring of the populations of bats, GCN and grass snake would be required.
- 9.9.304 Monitoring of any habitat creation would also be required to determine its success and to inform whether any remediation works were required.

Significance of Effects

- 9.9.305 The proposed monitoring would be undertaken as part of the Project; therefore, the significance of effects would remain as presented above.

Design Year: 2038

- 9.9.306 The majority of impacts on ecology are associated with the construction of the Project and would therefore have occurred by 2038. Details below are provided with respect to those receptors where there is the potential for an impact to occur during the operational phase of the Project.

Designated Sites

- 9.9.307 The Project would be fully built out by 2038, resulting in an increase to approximately 75.6 million passengers per annum (mppa). This would result in an increase in road vehicle emissions and aviation emissions from an increase in passengers travelling to the airport and taking flights.
- 9.9.308 An air quality assessment for 2038 is being completed and will be reported in the ES.

Watercourses, Aquatic Invertebrates and Fish

- 9.9.309 Operational surface water management and associated discharge would continue to be regulated by the airport's Environment Agency permit (see Chapter 11 Water Environment). As such, the magnitude of impact and significance of effect on watercourses, along with associated aquatic invertebrate and fish would therefore be **no change**.

Bats

- 9.9.310 The increased capacity of the airport would result in an increase in the number of vehicles on the roads travelling to and from it. The revised highway layout would also result in the creation of flyovers moving vehicles from ground level to above ground level.
- 9.9.311 Crossing point and activity surveys for bats at the Riverside Garden Park and along the A23 found that the main commuting route used by bats was the River Mole corridor with the road not being used significantly, possibly due to the high light levels and existing levels of disturbance present. Therefore, the operation of the road network during the construction phase is unlikely to have any impact on bat foraging or commuting routes. The magnitude of impact and significance of effect would therefore be **no change**.
- 9.9.312 The potential for impacts to bats from changes to air traffic movements associated with the operational phase of the Project will be assessed fully in the ES. However, radio tracking of Bechstein's and other species has shown that bats mainly use the periphery of the airport, where habitats are of higher quality, with only occasional use of the airfield and more disturbed areas. Therefore, impacts to bats from the operation of the airport from changes to air traffic movements is anticipated to be of negligible magnitude and significance.

Badger

- 9.9.313 The increase in operational traffic surrounding the Project site would mean that there would be the potential for a corresponding increase in road mortality for badgers using the Site. However, the main traffic increases would be associated with movements along the A23, well away from any existing badger population. Therefore, it is likely that the impact of the operational phase of the Project on badger would be negligible. This would result in a **negligible** effect.

Otter

- 9.9.314 The increase in operational traffic surrounding the Project site would mean that there would be the potential for a corresponding increase in road mortality for otter using the watercourse corridors. However, the river bridges would be maintained with sufficient room beneath to enable safe passage along the rivers for otter. Therefore, it is likely that the impact of the operational phase of the Project on otter would be negligible. This would result in a **negligible** effect.
- 9.9.315 No other operational activities would have an effect on ecology and nature conservation.

9.9.316 The habitats created by the Project would have established or be establishing by 2038 and the protected and notable species present would be benefitting from their presence. The overall effect of the Project on ecology and nature conservation will be reported in the ES.

9.10. Potential Changes to the Assessment as a Result of Climate Change

9.10.1 There is considerable uncertainty in relation to how species and habitats will respond to changing conditions and how management practices may change as a result of climate change. Some qualitative observations of potential climate change impacts on habitats and species that may occur in the vicinity of Gatwick are outlined below, summarised from Moorcroft & Speakman (2015).

- Wetlands: Reduction in summer rainfall would adversely affect many wetland habitats, such as those associated with the flood compensation areas. Human-induced impacts from drainage and use of fertilisers have had a greater impact than climate change on freshwater ecology to date.
- Grasslands: Some grasslands are likely to be very sensitive to changes in rainfall, particularly those that are associated with waterlogged conditions for part or all of the year. An increase in summer droughts could lead to a decline in distinctive wet grassland communities, including water meadows and rush pastures. This is also relevant to the habitats that are proposed within the flood attenuation areas.
- Woodlands: Beech, birch and sycamore are more sensitive to drought than other species. Increased frequency and / or severity of drought could lead to major changes in the composition and structure of woodland. These species are present within the vicinity of Gatwick but do not occur in high quantities within the habitats present within the Project site boundary.
- Reptiles and amphibians: Reductions in frog and toad populations are consistent with low summer rainfall and consequent lower soil moisture during drier summers, alongside other factors such as habitat loss. Common lizards, smooth newts and adders are predicted to lose suitable climatic conditions across England under many climate change scenarios but may expand their range in Scotland.
- Mammals: Climate change may affect bat populations through changes in their yearly hibernation cycle, breeding success and food availability. Reduced water flow in rivers would adversely affect water voles and otters. Milder winters could result in increasing populations of some species such as badgers as a result of increasing food availability and an earlier onset of spring.
- Non-native species: A change in climate could increase the colonisation of non-native flora and fauna as habitats alter and become more favourable for them.

9.10.2 The mitigation measures designed into the Project, both for ecology and nature conservation and other disciplines, take into account potential changes associated with climate change. For example, the plant species used in landscaping proposals would be tolerant of changes to the climate and would not include species that would be readily susceptible to decline. The flood risk modelling considered changes to climate and the design of the flood attenuation areas will consider this ensuring there is sufficient storage of flood waters so that they do not affect drier habitats. The flood compensation areas and new ponds would be designed to have permanently damp and wet areas to support the species reliant on these conditions. The potential for the success of mitigation measures to be affected by climate change is therefore low.

- 9.10.3 The assessment of effects for the operational phase on ecology and nature conservation is not therefore anticipated to be affected by climate change.

9.11. Cumulative Effects

Zone of Influence

- 9.11.1 The zone of influence (Zol) for ecology and nature conservation has been identified based on the spatial extent of likely effects. The Zol extends to 20 km for European statutory designated sites. The effect on European statutory designated sites is covered in the Habitat Regulations Assessment in Appendix 9.9.1.
- 9.11.2 The Zol for habitats and species extends up to 2 km from the Project site boundary.

Screening of Other Developments and Plans

- 9.11.3 The Cumulative Effect Assessment (CEA) takes into account the impact associated with the Project together with other developments and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise undertaken as part of the 'CEA short list' of developments (see Appendix 19.4.1). Each development on the CEA long list has been considered on a case-by-case basis for scoping in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.
- 9.11.4 In undertaking the CEA for the Project, it is important to bear in mind that the likelihood of other developments and plans being constructed varies depending on how far along the planning process they are. For example, relevant developments and plans that are already under construction are likely to contribute to a cumulative impact with the Project (providing impact or spatial pathways exist), whereas developments and plans not yet approved or not yet submitted are less certain to contribute to such an impact, as some may not achieve approval or may not ultimately be built due to other factors. For this reason, all relevant development and plans considered cumulatively alongside the Project have been allocated into 'Tiers', reflecting their current stage within the planning and development process. Appropriate weight is therefore given to each Tier in the decision-making process when considering the potential cumulative impact associated with the Project (eg it may be considered that greater weight can be placed on the Tier 1 assessment relative to Tier 2). Further details of the screening process for the inclusion of other developments and plans in the short list and a description of the Tiers is provided in Chapter 19: Cumulative Effects and Inter-relationships.
- 9.11.5 The specific developments scoped into the CEA for ecology and nature conservation and the Tiers into which they have been allocated, are outlined in Table 9.11.1. The developments included as operational in this assessment have been commissioned since the baseline studies for this Project were undertaken and as such were excluded from the baseline assessment. Full details of each of the developments is provided in Appendix 19.4.1.
- 9.11.6 Note that due to the uncertainty regarding when Heathrow's third runway will come forward, it has not been included in the cumulative assessment for ecology. Given the distance between the sites, overlapping direct impacts on ecology receptors are considered highly unlikely. Further, as set out in Chapter 13 Air Quality, the Heathrow third runway surface access narrative is predicated on a 'no more traffic' scenario, which is to say that total car traffic to Heathrow Airport

would be maintained at existing levels such that no greater air quality effects from traffic would occur. GAL will, however, keep this under review and as it progresses its work and prepares its final documents, including the formal Environmental Statement to accompany the application for development consent.

Table 9.11.1: List of Other Developments and Plans considered within CEA

Description of Development/Plan	Planning Phase	Distance from the Project	Date of Construction (if applicable)	Overlap with the Project?
Tier 1				
CR/2016/0858/ARM Forge Wood Employment Building, car parking, internal access roads, footpaths, parking and circulation areas, hard and soft landscaping and other associated infrastructure and engineering works.	Assumed under construction	1.6 km	2019	Construction
CR/2017/0810/FUL the temporary use (for a period of 5 years) of the site as a Park and Ride car park, comprising 892 car parking spaces (814 long stay) and associated infrastructure including offsite highway improvements and the temporary conversion of the existing bungalow into associated office space.	Awaiting decision	1.2 km	2021	Construction
CR/2018/0894/OUT Land North of Steers Lane; 185 residential dwellings with associated vehicle and pedestrian access, car parking and cycle storage and landscaping.	Assumed under construction	1.3 km	2020	Construction
2019/548/EIA Roundabouts Farm, Copthorne; 360 residential units made up of 2, 3 and 4-bedroom detached, semi-detached and terraced houses, and potentially some 1-bedroom flats and a small amount of commercial development of circa 7,000 sq ft.	Screening Decision	1.5 km	2021/2022	Construction and Operation (2026)
CR/2015/0552/NCC (and subsequent reserved matters and non-material amendment applications). Forge Wood. Allocated in Crawley Local	Awaiting decision	1.6 km	C. 2021	Construction

Description of Development/Plan	Planning Phase	Distance from the Project	Date of Construction (if applicable)	Overlap with the Project?
Plan 2030 (Adopted) known as Forge Wood. Erection of up to 1900 dwellings, 5000 sqm. of use class b1, b2 & b8 employment floorspace, 2500sq.m. of retail floorspace, a local centre/community centre (including a community hall), a new primary school, recreational open space, landscaping, the relocation of the 132kv ohv power line adjacent to the M23, infrastructure and means of access.				
CR/2015/0718/ARM Allocation within Crawley Local Plan 2021-2037 (Regulation 19). Approval of Reserved Matters for Phase 2B for 169 dwellings and associated works pursuant to outline permission CR/2015/0552/NCC for a new mixed use neighbourhood.	Approved	1.6 km	C.2021	Construction
EIA/20/0004 EIA Scoping for West of Ifield - allocated site. The proposed development is on a site of 194 hectares in size with a minimum of 3,250 homes and up to 4,000 homes along with social infrastructure, green infrastructure and highway links.	Screening Decision	1.5 km	Unknown	Construction
Tier 2				
None present				
Tier 3				
Land west of Balcombe Road, Horley Strategic Business Park - 83ha with 200,000 sqm office space.	Development Management Plan 2018-2027 (Reg 22 Submission)	0.4 km	Unknown	Unknown
Land north of Rosemary Lane - Identified for a potential ca. 150 housing units, 5.12 hectare site.	Housing & Traveller Site	1.4 km	Unknown	Unknown

Description of Development/Plan	Planning Phase	Distance from the Project	Date of Construction (if applicable)	Overlap with the Project?
	Plan (Adopted 2014)			
Land east of Ifield Road - Identified for a potential ca. 150 housing units, 9 hectare site with 5 hectares developable.	Housing & Traveller Site Plan (Adopted 2014)	1.4 km	Unknown	Unknown
Land off the Close and Haroldslea Drive: Residential allocation, up to 40 new homes, 2.4 hectare site.		1.2 km	Unknown	Unknown
Land West of Reigate Road, Hookwood Site Allocation Policy SA42: Site identified in the Reg 18 consultation draft local plan (Feb 2020 to March 2020) for 450 dwellings and two gypsy and traveller pitches.	Consultation draft local plan (Feb 2020 to March 2020)	0.3 km	Unknown	Unknown
Gatwick Airport Sewage Treatment Works: Land within the airport available for extension to the Crawley Sewage Treatment Works if required.		0 km	Unknown	Unknown

Cumulative Effects Assessment

- 9.11.7 A description of the significance of cumulative effects upon ecology and nature conservation receptors arising from each identified impact is given below.
- 9.11.8 Only receptors that the Project would have an effect on, and which are mobile species that could be affected by development within the wider area, have been included, unless the receptor is within a site that is closely connected to the Project site.

Initial Construction Phase: 2024-2029

- 9.11.9 The Tier 1 developments would result in the permanent loss of existing habitats and would have effects on protected and notable species, although losses would be compensated for. Construction of these developments could give rise to disturbance impacts, which have potential to result in greater disturbance to species if construction overlaps with the construction of the Gatwick Project.
- 9.11.10 There is less certainty on the potential effects of some of the Tier 3 developments due to the absence of ecology survey information. However, Horley Strategic Business Park, Land West of Reigate Road, Hookwood and Gatwick Airport Sewage Treatment Works are within close proximity or connected to the Project site and have greater potential to affect the same receptors as those identified on it.

Breeding Birds (Annex 1 EU Birds Directive and/or Listed under Schedule 1 of the WCA)

- 9.11.11 No Schedule 1 or Annex 1 birds were recorded within the Tier 1 developments and therefore no cumulative effects are foreseen.

Breeding Birds (NERC Species of Principal Importance and BoCC Red or Amber Listed Species)

- 9.11.12 The majority of the Tier 1 and 3 developments would result in the loss of nesting sites for breeding birds and Red and Amber listed species were recorded on Tier 1 sites. The developments would compensate for this loss through new landscape planting and the provision of bird boxes which in combination with the proposed mitigation on the Project site would ensure there would be a long-term, negligible impact.

- 9.11.13 Should nesting habitat be lost from all developments at the same time and no mitigation put in until the end of the developments, there is potential for there to be an overall decrease in nesting sites and increased competition to win suitable territories. This could potentially have a medium-term, medium impact on the bird assemblage, which is of local value, resulting in a **minor adverse** effect.

Grass Snake

- 9.11.14 Grass snake was recorded on two developments (West of Ifield and Forge Wood) within 2 km of the Gatwick Project site. The sites were located approximately 1.5/1.6 km away to the south east and south west of the Project. Grass snake ranges have been estimated to be between 1.29 hectares and 3.56 hectares but can extend up to 9.41 hectares (Reading and Jofre, 2009) so there is potential for the grass snake populations in the east and west of the Project site to be connected to the grass snake populations on the other development sites. Forge Wood includes the Gatwick Stream within its boundary which strengthens the habitat connectivity between the two areas. The West of Ifield project includes the River Mole within its boundary, however, the low value habitats associated with the airport separate the sites, including a culverted section of the watercourse which significantly reduces habitat connectivity for grass snake.
- 9.11.15 The Forge Wood development is due to be completed before the construction of the Gatwick Stream flood compensation area in 2036. The Project would affect habitats used by the low population of grass snake that was present in this part of the site but is predicted to have a negligible effect once mitigation measures are in place.
- 9.11.16 Mitigation measures would also be in place on the other development sites reducing potential impacts on the grass snake populations present. However, if the same grass snake population was present within all three areas, the loss of habitat and potential stress caused to individual grass snakes could result in a medium magnitude, medium-term impact. The cumulative effect on the grass snake population which is of local value would be **minor adverse**.

Great Crested Newt

- 9.11.17 Populations of GCN were identified on three other development sites within 2 km of the Project site; Forge Wood (1.6 km away); Land North of Steers Lane (1.3 km away) and West of Ifield (1.5 km away). Two sites are located to the south east of the Project site boundary and one is to the south west.
- 9.11.18 Whilst GCN have been recorded travelling up to 1.3 km from breeding ponds, they typically stay within the area approximately 250 metres from breeding ponds (English Nature, 2001). It is

therefore considered unlikely that GCN would commute from the known GCN breeding ponds on site to those within the nearby development sites.

- 9.11.19 If there was movement between the two areas, it is likely that GCN would be travelling through areas outside of parts of the Project site that would be affected by construction as the breeding ponds are to the east of them.
- 9.11.20 Horley Strategic Business Park, Land West of Reigate Road, Hookwood are not located near to parts of the Project site that have the potential to support GCN and therefore no cumulative effects are foreseen.
- 9.11.21 Gatwick Sewage Treatment Works would be located in close proximity to the known GCN population in the east of the Project site. The effects of the Project on this population would be negligible and given the small footprint of the sewage treatment works and the implementation of appropriate mitigation would result in no cumulative increased effects.
- 9.11.22 The impact of the Project with the three other developments within 2 km would therefore be negligible over a medium-term. The cumulative effect on GCN (a receptor of local value) would therefore be **negligible**.

Common Toad

- 9.11.23 The combined area of the Tier 1 and 3 developments would account for a relatively small loss of terrestrial habitat for common toad within the wider geographical area. There would therefore be no change to the medium-term, low impact that the Project would have in isolation. This would result in a cumulative **negligible** effect on a receptor of local value.

Badger

- 9.11.24 Badger setts were identified within two Tier 1 developments; Forge Wood and West of Ifield, but some survey results were confidential so there is potential for them to be present on other sites. Given the distance between the other developments and the known badger territories within the Project site boundary it is considered unlikely that the same social group of badgers would be present within other developments. Therefore, the Project would not contribute to any cumulative effect greater than the effect of the Project individually.
- 9.11.25 Badger presence is not known within the Tier 3 sites but given their close proximity to the Project site there is potential for the badger social groups present to also use these sites. The land that may be used for any future sewage improvements, if required, is connected to the Project site in an area where badgers were recorded and could therefore affect badger territory. The small footprint of the works and the implementation of appropriate mitigation measures would result in a negligible cumulative effect.
- 9.11.26 Horley Strategic Business Park and Land West of Reigate Road, Hookwood adjoin parts of the Project site where levels of badger activity were low and therefore the badger social groups would be unlikely to be affected by the developments once suitable mitigation measures were in place to protect them during construction. No cumulative effects are foreseen.

Otter

- 9.11.27 No signs of otter were identified on other development sites. No cumulative effects are therefore envisaged.

Assemblage of Bat Species

- 9.11.28 No confirmed bat roosts were identified on any of the Tier 1 or 3 developments. Bat activity was recorded with species assemblages being similar to those recorded on the Project site. Bats are highly mobile species and, therefore, there is potential for the same bats to be utilising foraging habitat within more than one proposed development site. There is also potential for bats displaced from one development site to utilise habitats on another and therefore be affected by habitat loss at more than one location.
- 9.11.29 The creation of new foraging habitat early in the Project programme would help to reduce the effects of habitat loss. Given that higher value foraging habitat such as woodland takes a long time to establish, there is potential for there to be a long-term loss of habitat for foraging and commuting bats.
- 9.11.30 All of the developments combined account for a relatively small area with substantial areas of suitable habitat being retained within the wider landscape, including high value habitats such as woodland. The impact of losing foraging habitat on all of the development sites could therefore have a long-term, medium impact on the bat assemblage, which is of local value, resulting in a **minor adverse** effect.

Bats (Bechstein's Bat and Barbastelle Bat)

- 9.11.31 Bechstein's bat was not confirmed to be present on any Tier 1 or 3 site. However, bats from the *Myotis* family were recorded and there is potential for some of those to be Bechstein's bat.
- 9.11.32 The Tier 1 and 3 developments include residential developments on the outskirts of Gatwick, Copthorne and Crawley which comprise farmland habitats likely to be of some value to Bechstein's bats. The Bechstein's bats recorded on the Project site are considered most likely (subject to additional survey work) to be part of a population centred around higher value habitat to the west of Gatwick. There are few developments proposed in the area between and those that are proposed are unlikely to significantly affect higher value Bechstein's bat habitat (such as woodland). The cumulative impact on the population, which is of County value, is therefore considered to be negligible, resulting in a **negligible** effect.
- 9.11.33 Barbastelle was recorded at two developments, Forge Wood and West of Ifield, both large residential-lead developments approximately 1.5/1.6 km south of the Project boundary. The low detection rate of barbastelle both within the Project site and the Tier 1 and 3 developments suggests they do not frequently utilise habitats in close proximity to urban areas, or that the population in the area is very small. Larger areas of woodland within the surrounding landscape are predominantly not affected by proposed developments.
- 9.11.34 The cumulative impact of loss of foraging habitat therefore appears to be negligible. All developments would need to provide compensation for the loss of foraging and commuting habitat through new habitat creation. Therefore, the overall effect on barbastelle bats, which are of County value, would be **negligible**.

Harvest Mouse

- 9.11.35 The combined area of the Tier 1 and 3 developments would account for a relatively small loss of terrestrial habitat for harvest mouse within the wider geographical area. There would therefore be no change to the effect that the Project would have in isolation.

Hedgehog

- 9.11.36 The combined area of the Tier 1 and 3 developments would account for a relatively small loss of terrestrial habitat for hedgehog within the wider geographical area. There would therefore be no change to the effect that the Project would have in isolation.

2030-2032

- 9.11.37 Two developments would be potentially under construction during the first full year of operation when parts of the Project would still be under construction; West of Ifield (1.5 km away) and Roundabouts Farm, Copthorne (1.9 km away). There is potential for other Tier 3 projects to also be under construction.
- 9.11.38 No detailed ecology assessments have been undertaken for these other developments and therefore a detailed assessment of cumulative effects cannot be undertaken at this stage.
- 9.11.39 A number of developments would be operational, and any habitat creation would be complete thereby compensating for any construction phase cumulative effects and potentially offering additional habitats to more mobile species.

2033-3038

- 9.11.40 The construction of all developments with known timescales would be complete by 2033. Any habitat creation would be complete thereby compensating for any construction phase cumulative effects and potentially offering additional habitats to more mobile species.
- 9.11.41 Tier 3 developments could be under construction but without detailed ecology assessments it is not possible to determine cumulative effects at this stage.

Design Year: 2038

- 9.11.42 Tier 3 developments could be under construction but without detailed ecology assessments it is not possible to determine cumulative effects at this stage.

9.12. Inter-Related Effects

- 9.12.1 The assessment for ecology and nature conservation has been undertaken with consideration of inter-relationships between topics. This has included the inter-relationships with Chapter 13: Air Quality, Chapter 11: Water Environment and Chapter 12: Traffic and Transport.
- 9.12.2 No other inter-relationships have been identified.

9.13. Summary

- 9.13.1 The Project site largely comprises low value habitats associated with the airport and its infrastructure. The site consists of large areas of hard standing and amenity grassland with areas of ornamental shrub and tree planting. These areas are predominantly located within the centre of the Project site with areas of higher value habitats to the east and west.
- 9.13.2 The Gatwick biodiversity area east of the airport comprises a variety of grasslands with trees, woodland and hedgerows. Gatwick Stream flows through the site and larger areas of semi-natural broadleaved woodland surround it, including areas of ancient woodland. Existing car parking areas to the north include linear strips of woodland which connect to the woodland to the south.

- 9.13.3 The River Mole corridor (NWZ biodiversity area), comprising a variety of damp and dry grasslands, wetland areas, the stream and semi-natural broadleaved woodland is present in the western part of the site. This includes an area of ancient woodland.
- 9.13.4 Smaller areas of higher value habitat are present to the north and south of the airport and include Riverside Garden Park which comprises semi-natural broadleaved woodland interspersed with areas of grassland and tall ruderal vegetation. Gatwick Stream flows through it.
- 9.13.5 Crawler's Field to the south of the airport comprises grassland and semi-natural broadleaved woodland. Crawler's Stream flows through this area but is heavily managed, reducing its ecology value.
- 9.13.6 An assessment of the effects found that the Project would have no effect on statutory or non-statutory designated sites or areas of ancient woodland. The effects on habitats and species are generally found to be not significant. However, the initial construction phase (2024-2029) of the Project would require the removal of species-poor hedgerow and loss of plantation woodland and scrub habitat. The loss of these habitats would result in moderate adverse and significant effects that would not be mitigated for until the end of the construction phase. Additional hedgerow planting would be undertaken early in the construction phase on other parts of the Project site, which would enhance habitat connectivity in these areas. This would result in a moderate beneficial and significant effect in the longer term.
- 9.13.7 The Project would require the removal of habitats in the initial construction phase which would result in the temporary displacement of breeding birds. The loss of suitable breeding sites would result in a moderate adverse and significant effect during the initial construction phase (2024-2029). The habitat loss would also result in a temporary moderate adverse effect on the bat and invertebrate assemblages. This would be a temporary effect until new tree, grassland and shrub planting had established.

Next Steps

- 9.13.8 Trees that would be affected by the Project will be identified and bat roost surveys undertaken to determine whether bat roosts are present, the species of bat using them and the number of bats.
- 9.13.9 Further surveys are proposed for GCN and bat activity to better understand their distribution and presence around the populations already identified.
- 9.13.10 The findings of all the additional surveys would be reported and an assessment of any effects included in the ES.

Table 9.13.1: Summary of Effects

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Construction Phase 2024-2029 (Construction Effects up to first opening of Northern Runway)							
Statutory designated sites	International	No impact	Medium term	No Change	No Change	Not significant	Due to the distance of internationally, nationally and locally designated sites and the mitigation measures designed into the Project there would be no impact from the construction phase.
Statutory designated sites	National	No impact	Medium term	No Change	No Change	Not significant	
Statutory designated sites	County	No impact	Medium term	No Change	No Change	Not significant	
Non-statutory designated sites	County	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction.
Ancient woodland	Regional	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction.
Semi-natural broadleaved woodland and mature broadleaved trees	County	Loss of woodland	Long term	Low	Minor adverse	Not significant	Small parts of larger woodland areas would be lost and compensated for.
Hedgerows	County	Loss of species-poor hedgerow to South	Medium term	Medium	Moderate adverse	Significant	The hedgerows and the habitat connectivity they

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
		Terminal roundabout improvements					provide would be lost and compensated for once new planting is established.
		Reconfiguration of airport facilities	Long term	Medium	Moderate beneficial	Significant	Initial loss compensated for by replacement planting.
Watercourses (River Mole and Gatwick Stream)	County (River Mole)	Construction of new channels for flood compensation resulting in a small loss of bankside habitat.	Short term	Negligible	Negligible	Not significant	The effects would be negligible due to very short sections of river being affected and being replaced with higher value habitat.
		The creation of new bankside habitats and channels (associated with flood compensation areas) that are intermittently wet would increase the overall habitat resource	Long term	Low	Minor beneficial	Not significant	
		Increase in sediment and decrease in water quality	Short-term	Negligible	Negligible	Not significant	The effects would have a minimal effect on the ecology of the watercourse.
		Diversion of the River Mole	Medium term	Low	Minor adverse	Not significant	A relatively short section of stream would be affected

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
							meaning the effects would not be significant.
		Creation of a new section of river channel providing high value habitats	Long term	Medium	Minor beneficial	Not significant	Successful creation of the new channel and establishment of native flora and fauna would have a beneficial effect.
		Failure or delay in creating new habitat	Medium term	Low	Minor adverse	Not significant	Delays or the need for remediation work could result in the impact from construction being extended.
Ponds (NERC S.41 Habitat)	County	No impact	Medium term	No Change	No Change	Not Significant	The mitigation measures designed into the Project would ensure there was no impact from construction.
Ponds (not NERC S.41 Habitat)	Local (Pond A, FFJ and F)	Loss of two ponds	Medium term	Low	Minor adverse	Not significant	The effects would be medium-term as the ponds would be replaced.
		Creation of two ponds	Long-term	Low	Negligible	Not significant	

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
		Overall impact of initial loss followed by new pond creation	Long-term	Low	Minor adverse	Not significant	
Semi-improved neutral grassland	Local	Loss of grassland	Long term	Medium	Minor adverse	Not significant	The area of loss would be relatively small and only until new habitats had established. There would be a net increase in the amount of semi-improved neutral grassland on the Project site post construction.
		Grassland creation	Long-term	Medium	Minor beneficial	Not significant	
Marshy grassland	Local	Loss of grassland	Medium term	Low	Minor adverse	Not significant	The loss of grassland would be mitigated for through new grassland creation at the end of the construction phase resulting in a long-term gain.
		Grassland creation	Long-term	Medium	Minor beneficial	Not significant	
Broadleaved plantation woodland and associated scrub	Local	Loss of woodland and scrub and loss of habitat connectivity	Long-term	High	Moderate adverse	Significant	The long-term loss of woodland and scrub habitat would reduce habitat connectivity across the landscape until new woodland planting had established.
		New woodland creation and improved connectivity	Long-term	Low	Minor beneficial	Not significant	

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Flora: Bluebell and pennyroyal	Local (Bluebell)	Loss of small areas of woodland habitat and translocation to new habitat	Long-term	Low	Minor adverse	Not significant	Some bluebell would be translocated and some would survive but there would be some loss.
	Local (Pennyroyal)	Disturbance to Pond F	Medium-term	Medium	Minor adverse	Not significant	Pennyroyal would be protected from physical damage but could be affected by changes to water quality of Pond F.
Flora: Lesser quaking grass, narrow-lipped helleborine, ragged robin and solomon's seal	Local	No impact	Long-term	No Change	No change	Not significant	Measures to protect habitats of value from pollution events would ensure the plants were not affected.
Breeding birds (Listed under Schedule 1 of the WCA)	Up to Regional	No current impacts identified. Further surveys are required to determine any future impacts	Short-term	No change	No change	Not significant	No Annex or Schedule 1 birds confirmed to be breeding in 2019 so no effects are foreseen. However, as birds can change their nesting sites year on year repeat surveys would be required during construction to assess potential future effects.

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Breeding bird assemblage including species of conservation interest (confirmed or possible);	County (reed bunting)	Loss of nesting sites followed by increase in nesting sites	Medium term	Medium	Moderate adverse	Significant	The medium term loss of habitat would be compensated for through new habitats being created in the long-term.
		Increase in nesting sites	Long-term	Low	Minor beneficial	Not significant	
		Overall impact of pond loss followed by pond creation	Long-term	Low	Minor adverse	Not significant	
	County (skylark)	Loss of nesting sites	Short-term	Low	Minor adverse	Not significant	The short term loss of habitat would be compensated for through new habitats being created.
	County (other)	Loss of suitable nesting sites for a range of species	Long-term	Medium	Moderate adverse	Significant	There would be a loss of nesting sites between habitats being lost and new habitats being sufficiently established to provide alternative nest sites which would have a significant effect on nesting birds. This would be reduced once new habitats were created.
Creation of replacement and additional nesting sites		Long-term	Low	Minor beneficial	Not significant		
Wintering bird assemblage	Local	Loss of foraging habitat	Medium term	Low	Minor adverse	Not significant	There were no wintering bird species recorded in numbers of national or international significance

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Grass snake	Local (Mole corridor (NWZ))	Loss and disturbance to habitat	Medium term	Low	Minor adverse	Not significant	Mitigation measures to move reptiles from construction areas and to create new habitat would ensure no effects were significant.
	Local (LERL)	No impact	None	No Change	No Change	No change	The grass snake population in this part of the site would not be affected at this stage of the Project
Great crested newt	Local (Western population)	Habitat creation	Long-term	Medium	Minor beneficial	Not significant	The GCN population to the West of the River Mole would not be affected by construction activities but a new pond created in a mitigation area would potentially provide a new breeding site.
	Local (Eastern population)	Loss and disturbance to habitat	Medium term	Low	Negligible	Not significant	Mitigation measures to move GCN from construction areas and to create new habitats would ensure no significant effect occurred.
Common toad	Local	Loss and disturbance to habitat	Long-term	Low	Negligible	Not significant	Substantial areas of suitable habitat would be retained and new habitats would be created meaning the

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
							temporary loss of habitat would not have a significant effect.
Badger	Local	Closure of main sett	Medium term	Low	Minor adverse	Not significant	An artificial sett would be created to compensate for the loss of a main sett.
Badger	Local	Risk of injury from construction works	Long-term	Negligible	Negligible	Not significant	Mitigation limiting vehicle speeds and making construction team aware of risks would reduce any effects.
Otter	County	Potential for disturbance if present	Long-term	Negligible	Negligible	Not significant	No otters have been recorded within the Project site boundary but on going monitoring would be undertaken during the construction phase.
Assemblage of other bat species	Local	Construction of airfield satellite contractor compound and diversion of River Mole	Long-term	Medium	Minor Adverse	Not significant	Mitigation during construction and long-term replacement planting would ensure effects were not significant.
		Construction of Surface access satellite contractor compound, South	Long-term	High	Moderate Adverse	Significant	The long-term loss of woodland, hedgerows and shrubs that form a linear corridor through the north of

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
		Terminal and North and South Terminal improvement works					the Project site would affect bat behaviour until new planting had established.
		Replacement woodland planting	Long-term	Negligible	Negligible	Not significant	
Bats (Bechstein's bat, barbastelle bat and alcahloe)	County	Loss of woodland and construction work in close proximity to high value habitat	Long-term	Low	Minor Adverse	Not significant	
Harvest mouse	Local	Loss and disturbance to habitat followed by the creation of new habitats	Medium term followed by long-term	Low	Negligible	Not significant	Areas of suitable habitat would be retained and new habitats would be created meaning the temporary loss of habitat would not have a significant effect.
Hedgehog	Local	Loss and disturbance to habitat	Medium term	Low	Minor adverse	Not significant	Areas of suitable habitat would be retained and new habitats would be created meaning the temporary loss of habitat would not have a significant effect.
Terrestrial Invertebrate assemblage	County	Habitat loss	Medium term	Medium	Moderate adverse	Significant	Habitat creation would compensate for the initial significant impact and result
		Habitat creation	Long-term	Low	Minor beneficial	Not Significant	

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
							in a long-term beneficial effect.
Shining Ramshorn Snail	Local	Habitat loss	Medium term	Low	Minor adverse	Not significant	Creation of the River Mole diversion will increase the overall length of riparian habitat for this species.
		Habitat creation	Long-term	Low	Negligible	Not significant	
Fish	Local	Habitat loss	Long-term	Low	Negligible	Not significant	Creation of the River Mole diversion will improve the flow characteristics of the river.
2030-2032 (Construction and Operational Effects)							
Statutory designated sites	International	No impact	Medium term	No Change	No Change	Not significant	Due to the distance of internationally, nationally and locally designated sites and proposed mitigation measures there would be no impact from the construction phase. The increase in vehicles accessing the site would not result in the predicted nitrogen oxides (NOx) concentration exceeding the critical level set for vegetation.
Statutory designated sites	National	No impact	Medium term	No Change	No Change	Not significant	
Statutory designated sites	County	No impact	Medium term	No Change	No Change	Not significant	

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Non-statutory designated sites	County	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction. There would be no operational effects.
Ancient woodland	Regional	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction. There would be no operational effects.
Semi-natural broadleaved woodland and individual broadleaved trees	County	Loss of woodland in combination with loss from the South and North Terminal improvements	Long-term	Medium	Moderate adverse	Significant	The Project currently proposes a significant loss of woodland that is mitigated for through new woodland planting at the end of construction. The combined effect on habitat connectivity is significant.
Hedgerows	County	Loss of species-poor hedgerow at location of Pier 7	Medium term	Negligible	Negligible	Not significant	A species-poor hedgerow would be lost and replaced with a species-rich hedgerow.
Watercourses	County	Highway improvement in close	Medium term	Negligible	Negligible	Not significant	Pollution control measures would ensure no impact on

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
		proximity to both watercourses					watercourses during construction.
Ponds (NERC S.41 Habitat)	County	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction. There would be no operational effects.
Ponds (not NERC S.41 Habitat)	Local (Pond D)	Increase in surface water discharge	Long-term	Negligible	Negligible	Not significant	The impacts would not have a significant effect on the pond.
	Local (new pond)	Pond creation	Long-term	Low	Minor beneficial	Not significant	A new pond would have a minor beneficial effect.
Semi-natural neutral grassland	Local	No impact	Medium term	No Change	No Change	Not significant	No impact predicted.
Marshy grassland	Local	Creation of new grassland	Long-term	Medium	Minor beneficial	Not significant	The construction of the flood attenuation areas would result in an increase in the amount of marshy grassland present on the site above pre-construction amounts
		Failure or delay in creating new habitat	Medium term	low	Minor adverse	Not significant	Delays or the need for remediation work could result

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
							in the impact from construction being extended.
Broadleaved plantation woodland and associated scrub	Local	No impact	Long-term	No change	No change	Not significant	This habitat would not be affected.
Flora: Bluebell	Local	Loss of woodland	Long-term	Low	Minor adverse	Not significant	Some bluebell would be translocated and some would survive but there would be some loss.
Flora: Lesser quaking grass, narrow-lipped helleborine, ragged robin and Solomon's seal	Local	No impact	Long-term	No change	No change	Not significant	These species would not be affected.
Breeding birds (Listed under Schedule 1 of the WCA)	Up to Regional	No current impacts identified. Further surveys are required to determine any future impacts	Short-term	No change	No change	Not significant	No Annex or Schedule 1 birds confirmed to be breeding in 2019 so no effects are foreseen. However, as birds can change their nesting sites year on year repeat surveys would be required during construction to assess potential future effects.

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Breeding birds (NERC Species of Principal Importance and BoCC Red or Amber listed species)	County	Loss of suitable nesting sites for a range of species	Medium term	Medium	Moderate adverse	Significant	There would be a loss of nesting sites in addition to those already lost to highway related work between habitats being lost and new habitats being sufficiently established to provide alternative nest sites.
		Increase in nesting sites due to habitat creation establishing	Long-term	Low	Minor beneficial	Not significant	
Wintering bird assemblage	Local	Loss of foraging areas	Long-term	Negligible	Negligible	Not significant	there were no wintering bird species recorded in any numbers which were considered to be of national or international significance
Great crested newt	Local	No impact	Medium term	No Change	No Change	Not significant	Great crested newt would not be affected by construction activities being undertaken at this stage of the Project
Grass snake	Local	No impact	Medium term	No Change	No Change	Not significant	Grass snake would not be affected by construction activities being undertaken at this stage of the Project
Common toad	Local	No impact	Medium term	No Change	No Change	Not significant	Common toad would not be affected by construction activities being undertaken at this stage of the Project

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Badger	Local	Increased construction traffic and associated movements	Medium term	Negligible	Negligible	Not significant	Mitigation measures would ensure risks from construction traffic were minimised.
Otter	County	Disturbance and reduced quality of habitat	Medium term	Low	Minor adverse	Not significant	Implementation of best-practice methods for pollution prevention (to be secured via the CoCP). Loss of woodland along Mole corridor resulting in loss of seclusion
Assemblage of Bat Species	Local	Loss of semi-natural broadleaved woodland due to Longbridge roundabout improvements	Long-term	High	Moderate adverse	Significant	The long-term loss of woodland resulting from all highway improvements in combination would have a significant effect on bat behaviour until new woodland planting had established.
		Woodland planting upon completion of highway improvements	Long-term	Low	Minor beneficial	Not significant	
		Increased artificial lighting from decked parking and hotels and loss of hedgerow at Pier 7	Long-term	Negligible	Negligible	Not significant	

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Bats (Bechstein's bat)	County	Loss of some habitats and a reduction in connectivity from Longbridge roundabout improvements	Long-term	Low	Minor adverse	Not significant	Potential effects on commuting behaviour due to loss of woodland. New woodland planting would create new areas of foraging habitat for Bechstein's bats and restore habitat connectivity, though these new habitats will take time to establish and mature
Harvest mouse	Local	New habitats would have compensated for loss of existing habitat	Long-term	Low	Minor beneficial	Not significant	There would be an increase in habitat availability to compensate for any losses.
Hedgehog	Local	New habitats would have compensated for loss of existing habitat	Long-term	Low	Minor beneficial	Not significant	There would be an increase in habitat availability to compensate for any losses.
Terrestrial invertebrate assemblage	County	New habitats would have compensated for loss of existing habitat	Long-term	Low	Minor beneficial	Not significant	There would be an increase in habitat availability to compensate for any losses.
Shining ramshorn snail	Local	New habitats would have compensated for loss of existing habitat	Long-term	Low	Negligible	Not significant	There would be an increase in habitat availability to compensate for any losses.

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Fish	Local	New habitats would have compensated for loss of existing habitat	Long-term	Low	Negligible	Not significant	There would be an increase in habitat availability to compensate for any losses.
2033-2038 (Construction and Operational Effects)							
Statutory designated sites	International	No impact	Medium term	No Change	No Change	Not significant	Due to the distance of internationally, nationally and locally designated sites there would be no impact from the construction phase. The increase in vehicles accessing the site would not result in the predicted nitrogen oxides (NOx) concentration exceeding the critical level set for vegetation
Statutory designated sites	National	No impact	Medium term	No Change	No Change	Not significant	
Statutory designated sites	County	No impact	Medium term	No Change	No Change	Not significant	
Non-statutory designated sites	County	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction. There would be no operational effects.
Ancient woodland	Regional	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
							would ensure there was no impact from construction. There would be no operational effects.
Semi-natural broadleaved woodland and mature broadleaved trees	County	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction. There would be no operational effects.
Hedgerows	County	No impact	Medium term	No Change	No Change	Not significant	The mitigation measures designed into the Project would ensure there was no impact from construction. There would be no operational effects.
Watercourses	County	Loss of a section of bankside habitat	Long-term	Low	Minor adverse	Not significant	A loss of a very small section of bankside habitat until new vegetation had established.
Broadleaved plantation woodland and associated scrub	Local	Loss of a small area of young plantation woodland from Gatwick Stream flood compensation area	Long-term	Low	Minor adverse	Not significant	A small loss of plantation woodland that would be compensated for within the wider Project.

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Semi-improved neutral grassland	Local	Loss of grassland followed by replacement of grassland	Long-term	Negligible	Negligible	Not significant	New grassland would be created to compensate for any that was lost.
	Local	Failure or delay in creating new habitat	Medium term	Low	Minor adverse	Not significant	Delays or the need for remediation work could result in the impact from construction being extended.
Marshy grassland	Local	Creation of new marshy grassland	Long-term	Low	Minor beneficial	Not significant	There would be an overall gain in marshy grassland
		Failure or delay in creating new habitat	Medium term	Low	Minor adverse	Not significant	Delays or the need for remediation work could result in the impact from construction being extended.
Breeding birds (all non-Schedule 1 species)	County	Loss of nesting sites	Long-term	Negligible	Negligible	Not significant	Small areas of suitable habitats for birds to nest would be lost given the total resource on site and within the wider area.
Wintering bird assemblage	Local	Loss of foraging sites	Medium term	Negligible	Negligible	Not significant	The loss of habitat would be small and new habitats would have developed.
Grass snake	Local	Habitat loss	Medium term	Negligible	Negligible	Not significant	Mitigation measures would reduce the impact on the small population present.

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
		Habitat creation	Long-term	Low	Minor beneficial	Not significant	Habitat creation would increase the amount of habitat available to grass snake.
		Failure or delay in creating new habitat	Medium term	Low	Minor adverse	Not significant	Delays or the need for remediation work could result in the impact from construction being extended.
Great crested newt	Local (Eastern population)	Loss of habitat and disturbance to individual GCN	Medium-term	Low	Negligible	Not significant	Mitigation measures would reduce the impact on the population present.
Common Toad	Local	Creation of new terrestrial habitat within Flood Compensation Area	Long-term	Low	Negligible	Not significant	The increase in the amount of terrestrial habitat for common toad would not have a significant effect on the population.
	Local	Failure or delay in new areas habitat establishing	Medium term	Low	Negligible	Not significant	The failure or delay in new areas of habitat establishing could have a negligible effect.
Badger	Local	Impacts from construction traffic and activities	Medium-term	Negligible	Negligible	Not significant	Mitigation measures would reduce the potential effects on badgers

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Otter	Local	Loss of habitat and disturbance to otters	Medium-term	Negligible	Negligible	Not significant	Mitigation measures would reduce the potential effects on otters
Assemblage of other bat species	Local	Small loss of foraging habitat for flood compensation area	Long-term	Negligible	Negligible	Not significant	The majority of the woodland and trees within this area would be retained.
Bats (Bechstein's bat)	County	Small loss of foraging habitat for flood compensation area	Long-term	Negligible	Negligible	Not significant	The majority of the tree lines within this area would be retained.
Hedgehog	Local	Small areas of habitat loss and the creation of new habitats	Long-term	Low	Minor beneficial	Not significant	New habitats would be created to compensate for those lost reducing the significance of any effect.
Terrestrial invertebrate assemblage	County	New habitats would have compensated for loss of existing habitat	Long-term	Low	Minor beneficial	Not significant	There would be an increase in habitat availability to compensate for any losses.
Shining ramshorn snail	Local	New habitats would have compensated for loss of existing habitat	Long-term	Low	Negligible	Not significant	There would be an increase in habitat availability to compensate for any losses.

Receptor	Receptor Sensitivity	Description of Impact	Short / medium / long term / permanent	Magnitude of Impact	Significance of Effect	Significant / not significant	Notes
Fish	Local	New habitats would have compensated for loss of existing habitat	Long-term	Low	Negligible	Not significant	There would be an increase in habitat availability to compensate for any losses.
Design year 2038 (Operational effects)							
Watercourses, Shining ramshorn snail and fish	Up to County	Changes to water quality from surface water discharge	Long-term	No Change	No Change	Not significant	Discharge of surface water will continue to be regulated by the EA to ensure water quality same as current permits.
Bats (all species)	County	Increased collision risk from road traffic	Long-term	No Change	No Change	Not significant	The A23 corridor is not used by significant numbers of bats.
Badger	Local	Increased collision risk from road traffic	Long-term	Negligible	Negligible	Not significant	Badger population located considerable distance from main areas of traffic increase (A23).
Otter	Local	Increased collision risk from road traffic	Long-term	Negligible	Negligible	Not significant	Otter will still be able to pass beneath the roads along the river corridors.

9.14. References

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9.15. Glossary

Table 9.15.1: Glossary of Terms

Term	Description
BAP	Biodiversity Action Plan
BDIR	Birds Directive
BOA	Biodiversity Opportunity Area
BoCC	Birds of Conservation Concern
CAA	Civil Aviation Authority
CARE	Central Area Recycling Enclosure
CEA	Cumulative Effects Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
CP	Country Park
CRoW	Countryside and Rights of Way
DMRB	Design Manual for Roads and Bridges
DRV	Designated Road Verge
eDNA	Environmental DNA (Deoxyribonucleic acid)
EIA	Environmental Impact Assessment
EPS	European Protected Species
ES	Environmental Statement
GAL	Gatwick Airport Limited
GCN	Great Crested Newt
HRA	Habitats Regulations Assessment

Term	Description
HSI	Habitat Suitability Index
IAACCF	Inter-agency Climate Change Forum
IEF	Important Ecological Feature
ILS	Instrument Landing System
JNCC	Joint Nature Conservation Committee
LERL	Land East of the Railway Line
LNR	Local Nature Reserve
LWS	Local Wildlife Site
NERC	Natural Environment and Rural Communities
NNR	National Nature Reserve
NOx	Nitrogen Oxides
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NWZ	North West Zone
NVC	National Vegetation Classification
ODPM	Office of the Deputy Prime Minister
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
SAC	Special Area of Conservation
SNCI	Site of Nature Conservation Importance
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TN	Technical Note
UKCP18	UK Climate Predictions 2018
WCA	Wildlife and Countryside Act
WHPT	Whalley Hawkes Paisley Trigg method
ZoI	Zone of Influence