

13 Ecology

13.1 Introduction

13.1.1 This chapter of the ES was prepared by BSG Ecology and presents an assessment of the likely significant effects of the Proposed Development on biodiversity, ecology and nature conservation. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and/or enhance likely beneficial effects. The nature and significance of the likely residual effects are reported.

13.1.2 This ES chapter is supported by the following appendices:

- Appendix 13.1: Policy and Legislation relevant to Ecology;
- Appendix 13.2: Ecology Baseline Report;
- Appendix 13.3: Biodiversity Net Gain Assessment;
- Appendix 13.4: Soil Survey Information; and
- Appendix 13.5: Arboricultural Impact Assessment.

13.1.3 This chapter sets out the study area, the baseline conditions, the scope and methods of the assessment, the key designed-in mitigation, the key biodiversity features, and the potential impacts of the proposed development on these. It then considers these potential impacts in detail and assesses their geographic scale and their magnitude. It then sets out appropriate mitigation measures, and assesses any residual effects that would occur, assuming the mitigation were to be fully implemented. The assessment of residual effects includes a consideration of the cumulative effects of the proposed development in relation to other planned developments.

Competence

13.1.4 This chapter was written by Jamie Peacock, Senior Ecologist at BSG Ecology and revised by Dr Tom Flynn, MCIEEM CEcol MSc, Principal Ecologist at BSG Ecology. Jamie and Tom have both worked on a wide range of ecological surveys and assessment and have carried out extensive survey work at the Site. It was reviewed by Judith Giles MCIEEM CEcol MEnvSci, Associate Director at BSG Ecology.

13.2 Legislation, Planning Policy and Guidance

Legislation Context

13.2.1 The following legislation is relevant to the Proposed Development (for further details, see Appendix 13.1):

- The Environment Act 2021 (Commencement No. 2 and Saving Provision) Regulations 2022¹;
- The Environment Act 2021²;

- The Conservation of Habitats and Species Regulations 2017³;
- The Natural Environment and Rural Communities (NERC) Act 2006⁴;
- The Wildlife and Countryside Act 1981 (as amended)⁵;
- The Protection of Badgers Act 1992⁶;
- The Wild Mammals (Protection) Act 1996 (as amended)⁷; and
- The Hedgerow Regulations 1997⁸.

Planning Policy Context

13.2.2 The following national, regional and local planning policy is relevant to the Proposed Development:

National

- National Planning Policy Framework (2021)⁹, notably paragraphs 9, 180 - 182;
- Government Circular ODPM 06/2005 Biodiversity and Geological Conservation (2005)¹⁰; and
- The England Biodiversity Strategy Climate Change Adaptation Principles (2008)¹¹.

Local

- Cherwell Local Plan 2011-2031 Part 1 (2016)¹²;
- Cherwell Local Plan 2011-2031 (Part 1) Partial Review – Oxford’s Unmet Housing Need (2020)¹³; and
- Cherwell Design Guide Supplementary Planning Document Masterplanning and architectural design guidance for residential development October 2017¹⁴.

Guidance

13.2.3 The following guidance is relevant to the Proposed Development:

- Natural England’s approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (2018)¹⁵;
- List of habitats and species of principal Importance in England (2022)¹⁶;
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Marine (2022) (‘Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines’)¹⁷;
- Bats and artificial lighting in the UK (2018)¹⁸;
- Biodiversity Metric 4.0 - User Guide (2023)¹⁹; and
- Survey specific guidance is referred to in Appendix 13.2.

13.3 Assessment Methodology

13.3.1 This assessment is principally based on the Parameter Plans and Development Specification. Secondary documents that have been utilised for reference include the Outline Landscape and Ecological Management Plan (LEMP), Outline Construction

Environmental Management Plan (CEMP) (see Appendix 6.1), Lighting Statement (see Appendix 5.5), and the surface water drainage strategy in the Flood Risk Assessment (FRA) (see Appendix 16.1). These documents will be secured by planning condition.

Consultation

Pre-Application Consultation

13.3.2 Table 13.1 summarises key comments raised by consultees of relevance to this assessment during pre-application meetings and/or communication exchanges and how the assessment has responded to them.

Table 13.1: Consultation Response Summary

Consultee and Comment	Response
<i>Cherwell District Council (05 February 2018)</i>	
The Ecology Officer agreed that the scope of surveys proposed was acceptable. Noted that justification was required for the lack of invertebrate surveys and that the need for wintering bird surveys should be assessed following the Phase 1 habitat survey update.	Aquatic invertebrate surveys of the Rowel Brook have been completed. Terrestrial survey for brown hairstreak butterfly has been carried out. Wider terrestrial invertebrate surveys are not considered necessary given the extent to which habitats (e.g., woodland along the Rowel Brook and hedgerows and grassland in the north-east of the Site) will be retained and/or enhanced in the Proposed Development. Wintering bird surveys were carried out, on a precautionary basis over the period December 2021 to February 2022, and found no significant activity at the Site. Refer to Appendix 13.2 for full details of these surveys.
<i>Natural England (11 May 2018)</i>	
Recommended a detailed assessment in relation to Rushy Meadows SSSI, to confirm any hydrogeological continuity between the Site and the SSSI, and potential for effects via flooding of the Rowel Brook. Recommended that impacts on the SSSI from recreation, air pollution (from vehicles) and habitat fragmentation should be considered. Mentioned that potential for air pollution on Oxford Meadows Special Area of Conservation (SAC) should be sufficiently addressed by the Cherwell Local Plan HRA.	A hydrological assessment undertaken by Buro Happold has confirmed that there is no hydrogeological connectivity to Rushy Meadows SSSI, that the Proposed Development will not increase surface water flooding at the SSSI and that there is no risk of surface water flooding from the Site reaching the SSSI. Further details are provided in Chapter 16: Water Resources and Flood Risk and associated appendices. Assessment of potential impacts on the SSSI from recreation, air pollution, and habitat fragmentation is included in this assessment.
<i>Environment Agency (11 May 2018)</i>	

Consultee and Comment	Response
<p>Noted that the Rowel Brook and section of North Yarnton Ditches at the Site are Main Rivers. Stated a requirement for a 10m undeveloped buffer zone adjacent to bank top of Main Rivers. Recommended a wider buffer zone where feasible. Noted that the development offers opportunities for the enhancement of watercourses and their corridor and for the creation of additional wetland habitats. Noted 2015 records of water vole in the Rowel Brook and Oxford Canal. Recommended ecological assessment of the Rowel Brook and a long-term management plan, to include opening up the canopy to allow in-channel vegetation. Noted that the EIA should cover impacts on the hydrology and water quality of the watercourses, and recommended surveys for dormouse, badgers, birds, reptiles and amphibians, habitats and trees.</p>	<p>The Rowel Brook sits within the proposed Rowel Brook Park, which provides a much wider than 10m zone in which no built development will occur as shown on the Parameter Plan – Green Infrastructure Plan. North Yarnton Ditches will be retained within greenspace, except for culverting of a section under the new railway road bridge. The standalone Outline LEMP sets out further details on the proposed habitat enhancement and management measures for the Rowel Brook Corridor and for the creation of additional ponds, scrapes and damp grassland that will be secured by planning condition.</p> <p>Chapter 16: Water Resources and Flood Risk and associated appendices assess impacts on hydrology and water quality.</p> <p>This assessment covers all of the species mentioned. Details of surveys undertaken for these species are included in Appendix 13.2.</p>
<i>Cherwell District Council (20 May 2021)</i>	
<p>The Ecology Officer stated that <i>'the proposed update surveys and justifications all look reasonable'</i>.</p>	<p>N/A</p>
<i>Cherwell District Council (19 October 2022)</i>	
<p>The Ecology Officer stated that <i>'The scope seems appropriate to me although I do not know this site particularly well. As long as anything omitted (such as Otter) is justified within your reports then I would not anticipate any issues with scope'</i>.</p>	<p>Such justification has been included in Table 13.5. Otter surveys have been included in the baseline assessment.</p>
<i>Cherwell District Council (February 2023)</i>	
<p>Notes that the masterplan should include green and blue infrastructure, biodiversity net gain, landscape to the north, landscape to the east of the railway, existing trees and hedgerows, and landscape within the development. Opportunities for natural drainage features in urban areas should be considered. The application shall be supported by a Biodiversity Improvement and</p>	<p>Ecological mitigation and biodiversity enhancement measures are included in the standalone Outline LEMP, or as appropriate in this ES Chapter and supporting appendices. This assessment includes a biodiversity net gain assessment (see Appendix 13.3).</p>

Consultee and Comment	Response
<p>Management Plan (BIMP) covering biodiversity net gain, protected species measures, protection measures for designated sites and retained habitats (including for noise and lighting), inbuilt bat and bird boxes and habitats and connectivity within urban areas, protection and enhancement of Sandy Lane and Yarnton Lane as wildlife corridors, creation of a green infrastructure network, local nature reserve, nature conservation area, protection and enhancement of the Oxford Canal corridor, restoration of water vole habitat, farmland bird compensation, wildlife management, measures for restricting public access to sensitive habitats. The response noted that the Proposed Development has the potential to achieve high levels of biodiversity net gain. Noted that a clear target (e.g., 90%) on hedgerows and trees to be retained should be set out.</p>	

EIA Scoping Opinion

- 13.3.3 A request for an EIA Scoping Opinion was submitted by the Applicant to CDC on 9th December 2022. An EIA Scoping Report (the ‘Scoping Report’) accompanied the request (Appendix 3.2). An EIA Scoping Opinion was issued by the CDC on 27th January 2023 (Appendix 3.3) which included comments from statutory consultees. Table 13.2 summarises key comments raised by consultees of relevance to this assessment by the EIA Scoping Opinion and how the assessment has responded to them.

Table 13.2: EIA Scoping Opinion Response

Consultee and Comment	Response
<i>Cherwell District Council (February 2023)</i>	
<p>Under the heading ‘Biodiversity’ Cherwell District Council mention that Rushy Meadows SSSI is within ca. 10m of the Site. They also mention that Oxford Meadows SAC and associated SSSIs are present c. 1.8 km south of the Site. They recommend that the assessment considers impacts on these and on the 17 non-statutory designated sites within 2km of the site. They mention hedgerows, semi-improved grassland, woodland corridors and a pond supporting great crested newt, and that the EIA should cover these features and other priority habitats. The</p>	<p>These designated sites and ecological features are considered within this assessment. This is based on appropriate surveys, the scope of which has been agreed with CDC’s Ecology Officer.</p> <p>In the proposed design, most hedgerows are being retained within greenspace as shown on the Green Infrastructure Parameter Plan, and</p>

Consultee and Comment	Response
<p>Council note the presence of bat activity, roosting bats, water vole, breeding birds, reptiles and brown hairstreak butterfly. They recommend that the EIA includes the results of appropriate surveys and addresses impacts on these species. They mention that hedgerows should be retained and enhanced, or (in exceptional circumstances) where not possible, compensated for by the planting of new hedgerows. The Council note that the proposed Nature Conservation Area and the Local Nature Reserve in the PR8 policy should be geared first and foremost to wildlife conservation and that detailed management plans should be submitted with any planning application and management organisations should be specified. There should be a hierarchy of access levels and some areas of green infrastructure should have no public access. Concerns about lighting effects on wildlife are mentioned. Bringing biodiversity into the built development is mentioned, including the use of green roofs and providing connectivity between gardens for hedgehogs.</p>	<p>ecological connectivity is being retained within the urban areas. The design includes nature conservation areas without public access and a publicly accessible nature reserve this is set out within the LEMP. The Proposed Development includes greenspace and green connections within urban areas, and connectivity between gardens is to be addressed during detailed design. The application includes an Outline Lighting Statement (see Appendix 5.5) which maintains dark areas for bats.</p>
<p><i>Natural England (January 2023)</i></p>	
<p>The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within the [Rushy Meadows] SSSI and identify appropriate mitigation measures to avoid, minimise or reduce any adverse significant effects.</p>	<p>The ES has provided a full assessment of the potential effects of the Proposed Development on Rushy Meadows SSSI.</p>
<p>The ES should consider any impacts upon local wildlife and geological sites, including local nature reserves.</p>	<p>A review has been carried out of local wildlife and geological sites in the study area that would be impacted by the Development. A number of Local Wildlife Sites and the Lower Cherwell Valley Conservation Target Area have been identified and are included in this assessment.</p>
<p>The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats).</p>	<p>The ES assessed the impacts on protected species during the construction and operational phases</p>
<p>The ES should assess the impacts of the proposal on any ancient woodland, ancient and veteran trees.</p>	<p>Potential impacts of road traffic emissions from the Proposed Development on relevant areas of ancient woodland are assessed in this ES chapter. Appendix 13.5 provides a</p>

Consultee and Comment	Response
	Tree Survey and Arboricultural Impact Assessment assessing potential implications for trees within the Site or on Site boundaries.
The ES should use an appropriate biodiversity metric such as Biodiversity Metric 3.0 together with ecological advice to calculate the change in biodiversity resulting from proposed development and demonstrate how proposals can achieve a net gain	Biodiversity Net Gain has been calculated for the Proposed Development. Full details are provided in Appendix 13.3.

Summary of Assessment Scope

13.3.4 As outlined within the EIA Scoping Report (Appendix 3.2), and as agreed with CDC via the EIA Scoping Opinion (Appendix 3.3), the scope of the ecology and biodiversity assessment within this chapter is limited to the following assessment of effects:

Construction

13.3.5 Potential significant effects during the construction phase that are considered in this assessment, and their causes or mechanisms, are listed in Table 13.3.

Table 13.3: Potential significant effects during construction

Effect	Possible Causes / Mechanisms
Habitat loss	Direct clearance or digging necessitating the felling of trees, removal or disturbance of vegetation such as hedgerow or soils by heavy plant, materials storage / stockpiling etc. Includes permanent changes in land use.
Habitat degradation	Pollution by fuels, lubricants, hydraulic fluid, cement or silt resulting in toxic effects to plants. Damage to soils or vegetation by physical damage and soil compaction resulting in changes in flora. Changes in hydrology resulting in the drying of wetland areas or reductions in local populations of wetland animals or plants. Includes permanent changes in land use.
Habitat fragmentation	Temporary or permanent reduction in habitat connectivity through severance of habitat corridors or isolation of patches of habitats, e.g., by severance of hedgerows or the removal/felling of woodland, installation of features or land-use that presents a barrier or hostile environment (such as roads or culverts).
Killing, injury or disturbance of animals	Digging, vegetation/tree removal, movement of vehicles/heavy plant, and entrapment of animals in trenches, pits or pipes.
Reduction in animal populations	Permanent loss of habitat.

Effect	Possible Causes / Mechanisms
Displacement of animals (especially bats)	Visual, noise or vibration-related disturbance from vehicles/heavy plant, lighting, digging or piling. Habitat loss and degradation (see above) may also displace resident animals.

Completed Development

13.3.6 Potential significant effects from the completed Proposed Development that are considered in this assessment, and their causes or mechanisms, are listed in Table 13.4.

Table 13.4: Potential significant effects from the completed Proposed Development

Effect	Possible Causes / Mechanisms
Habitat degradation	Increased recreational pressure (additional footfall), litter and fly-tipping, changes in air quality (due to increased traffic on roads in the vicinity of the Site), increased waste from increased numbers of dogs, increased lighting levels.
Habitat fragmentation	Reduction in habitat connectivity through road traffic.
Killing, injury or disturbance of animals	Additional traffic, increased risk of disturbance from visitors, impacts from increased numbers of cats and dogs. Increased recreational disturbance.
Reduction in animal populations	Permanent loss of habitat. Increased recreational pressure and predation pressure or disturbance from cats and dogs.
Displacement of animals (especially bats)	Visual (especially lighting), noise or vibration-related disturbance. Habitat degradation (see above) may also displace resident animals.

Cumulative Assessment

13.3.7 An assessment of the potential for in-combination cumulative effects with identified cumulative schemes in the Zone of Influence (Zoi) of the Proposed Development is provided in this ES chapter (see section 13.8 for further details).

Non-Significant Effects

13.3.8 The ecological features listed in Table 13.5 are scoped out of the EIA because it is considered there would be no potential for significant adverse effects on these receptors. In considering whether features should be scoped in or out of the assessment, the guidance in section two of the CIEEM Guidelines has been taken into consideration during the scoping process.

Table 13.5: Ecological features scoped out of EIA

Feature	Justification for scoping out
Arable land	The arable habitat at the Site is of an intensive nature. This habitat is common and widespread locally and nationally and is of low inherent ecological value. Its complete loss from the Site could not be a significant ecological impact. Impacts on animal species that use this habitat (such as birds and brown hare are considered separately).
Scrub	Due to the small extent of scrub at the Site, of limited ecological value and not a Habitat of Principal Importance in England (HPI), its complete loss from the Site would not be a significant ecological impact. Losses of scrub could cause impacts on reptiles and on the net biodiversity value of the Site, but these potential impacts are considered separately.
Tall ruderal vegetation	This habitat is of limited ecological value and not a HPI, its complete loss from the Site could not be a significant ecological impact.
Swamp	The small area of swamp is considered to be marginal vegetation and is included in the assessment under <i>Ponds</i> .
Introduced shrubs	This habitat is of low inherent ecological value and common nationally. Its complete loss from the Site would not be a significant ecological impact. Impacts on animal species that could use this habitat (such as nesting birds) are considered separately.
Buildings and hardstanding	This habitat is of low inherent ecological value. Its complete loss from the Site would not be a significant ecological impact. Impacts on animal species that use this habitat (such as bats) are considered separately.
Dormouse	Survey indicates that this species is absent from the Site.
Wintering birds	Survey indicates that the Site does not of significant value to wintering birds.
White clawed crayfish	Survey indicates this species is absent from the Site.
Fish	The Rowel Brook is being retained within an extensive green habitat corridor. This stream is susceptible to summer drying, so any fish community here is likely to be resilient. The Proposed Development is considered unlikely to significantly affect this feature.

Study Area

13.3.9 The Zone of Influence (Zoi) is defined as *“the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities”* in CIEEM Guidance¹⁷. The Zoi for the construction and operational phases of the Proposed Development are the same in this assessment.

13.3.10 In this assessment, the Zoi of the Proposed Development varies with the ecological feature being considered. For designated sites, it was considered, on a precautionary basis, as 10km for international statutory sites, 5km for other statutory sites, and 2km for non-statutory sites (including Ancient Woodland).

- 13.3.11 For terrestrial habitats within and near the Site (which are dominated by residential urban land which is not particularly sensitive to indirect impacts), the Zol is considered to be limited to the Site and to areas immediately adjacent to the Site boundary.
- 13.3.12 For bats, which may move many kilometres in a night, the Zol with respect to local connectivity, is considered to extend to 2km beyond the Site boundary. In respect of roosting sites, foraging habitat and commuting features, the Zone of Influence is considered to be limited to the Site itself, plus areas within 100m of the Site boundary (which could be subject to disturbance during construction or operation).
- 13.3.13 For great crested newt, which can move up to 500m from its breeding ponds, the Zol is considered to be 500m, except where significant barriers to its movements, or unsuitable habitats are present.
- 13.3.14 For all other species, the Zol is considered to be the area of the Site itself.

Establishing Baseline Conditions

- 13.3.15 BSG Ecology has conducted numerous ecology surveys at the Site since 2015. The initial survey in 2015 comprised of a desk study, extended Phase 1 habitat survey, and a badger survey. BSG Ecology also undertook a full suite of ecological baseline surveys and desk study work over the period 2017 to 2018, most of which were repeated in 2021 to 2023. These were agreed with the Ecology Officer at CDC.
- 13.3.16 The baseline survey and desk study work comprises the following:
- Ecology desk study (March 2023);
 - Extended Phase 1 habitat survey (June 2022);
 - Hedgerow survey and assessment (October 2021);
 - Botanical condition assessment of grassland (June 2022);
 - Badger survey (April 2022);
 - Bat roost assessment of buildings and trees (2021 and 2022);
 - Bat emergence / re-entry surveys of buildings and trees (2022 to 2023);
 - Bat activity survey (April to May 2022);
 - Dormouse survey (April to September 2022);
 - Water vole and otter survey (May and October 2022);
 - Breeding bird survey (April to June 2022);
 - Winter bird survey (December 2021 to February 2022);
 - Great crested newt eDNA survey (June 2021);
 - Great crested newt population assessment (April to May 2022);
 - Reptile survey (May to June 2022);
 - Brown and black hairstreak butterfly survey (February 2022);
 - Bat activity survey (April-October 2022);

- Aquatic macroinvertebrates survey (May and October 2022); and
- Crayfish survey (October 2017).

13.3.17 The scope of the baseline surveys were discussed and agreed with the Ecology Officer at Cherwell District Council as set out in the Ecology Baseline Report.

13.3.18 Details of the methods and results of these surveys are provided in the Ecology Baseline Report (see Appendix 13.2). The following paragraphs, and Tables 13.7 to 13.10 below summarise this information.

Assessing Likely Significant Effects

Evaluation of Ecological Resources

13.3.19 The assessment process documented in this ES Chapter has been undertaken with reference to relevant parts of the CIEEM Guidance¹⁷. Although this is recognised as the industry standard for ecological assessment, the guidance itself notes that it does not provide a prescription for Ecological Impact Assessment (EiA); rather, it sets out to provide guidance to practitioners for refining their own methodologies.

Construction and Completed Development Effects

13.3.20 Likely significant effects on ecological receptors are considered at the construction phase through consideration of relevant elements of the Proposed Development, notably the likely extent of vegetation removal, and intensity of construction activities.

13.3.21 Potential effects were assessed by considering the baseline ecology information (e.g., desk study data and ecology survey information), other relevant chapters in this ES (e.g. hydrological and air quality assessments), embedded mitigation (e.g., Outline CEMP), other strategies and/or plans for the Proposed Development to be discharged through planning condition (e.g. the Outline LEMP and the Outline Lighting Strategy), and information for Cherwell District Council (e.g. the Habitats Regulations Assessment for the Local Plan). As they are linked to principles in the Development Specification and will be controlled by planning condition, the principles of the Outline LEMP and the Outline Lighting Strategy are considered as embedded mitigation for the purposes of this assessment.

Cumulative Effects

13.3.22 The methodology for the cumulative assessment follows that set out for the main assessment. The ZoI considers the impacts of relevant schemes within 10km that have the potential to have an additive or synergistic effect when considered in conjunction with the potential effects of the Proposed Development. Schemes assessed are listed within this chapter, in alignment with those identified in Chapter 3: EIA Methodology.

13.3.23 It is assumed that, as with the Proposed Development, all schemes considered will be required to mitigate potential effects upon important ecological receptors and deliver a net gain in biodiversity in-line with the Local Plan.

Determining Effect Significance

Sensitivity of Receptor

Identification of Important Ecological Features

- 13.3.24 Under the CIEEM Guidance, the first step in the EclA process is determination of which ecological features or receptors (designated sites, habitats, species, ecosystems and their functions/processes) are important. Important features should then be subject to detailed assessment if they are likely to be impacted by a proposed development. It is not considered necessary to carry out detailed assessment of features that are sufficiently widespread and resilient to project impacts such that there is no risk to the integrity or viability of the resource.
- 13.3.25 Ecological features can be important for a variety of reasons and the rationale used to identify importance is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

Determining Importance

- 13.3.26 The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case:
- International (European);
 - National (United Kingdom);
 - Regional (Southern England);
 - County (Oxfordshire);
 - District (Cherwell District);
 - Local (ecologically linked habitats up to 2km from the Site); and
 - Site (the Site extent).

Impact Assessment

- 13.3.27 The impact assessment process involves (1) identifying and characterising impacts (taking account of any designed-in mitigation); (2) incorporating additional measures to mitigate for these impacts (including avoidance and compensation); (3) assessing the significance of any residual effects after mitigation; and (4) identifying opportunities for ecological enhancement.
- 13.3.28 Under the CIEEM Guidance, it is only necessary to assess and report significant residual effects, i.e., those that remain after mitigation measures (including avoidance and compensation measures) have been taken into account. However, reporting significant effects prior to the specification of mitigation can be a useful step in identifying and prioritising mitigation, and has been carried out in this assessment for this reason.
- 13.3.29 The assessment only describes those characteristics of impacts that are relevant to understanding an ecological effect and determining its significance. It considers, as appropriate: direct, indirect, secondary and cumulative impacts (noting that cumulative

impacts are reported at the end of this chapter, under 'Cumulative Effects'), and whether the impacts and their effects are of short, medium or long-term duration, permanent, temporary, reversible, or irreversible. Positive effects are referred to as beneficial, negative effects as adverse.

Significance Criteria

- 13.3.30 The CIEEM Guidance sets out information about the concept of ecological significance and how it relates to the ability to deliver biodiversity conservation objectives for a given feature.
- 13.3.31 Prior to the specification of additional mitigation, the significance of effects is qualified with reference to an appropriate geographic scale, and the scale of an effect may be lower the geographic context in which the feature is considered important (e.g., if the feature is only partially affected). This is defined in Table 13.6, providing a means of relating the geographic scale of impact to the categories used in the wider EIA process (i.e., effect is categorised into major, moderate, minor, negligible, and neutral).

Table 13.6: Relationship between geographic scale of impact and EIA significance

Geographic scale of impact	Significance value
International, national, or regional	Major
District or county level	Moderate
Site or local importance	Minor
Below the Site level	Negligible
No effect	Neutral

- 13.3.32 After the specification of additional mitigation, the residual effects are then assessed for their significance in the context of national and local planning policy. Significant effects are defined in the CIEEM guidance as follows: *“A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project”*. The guidance further points out that *“A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission.”*
- 13.3.33 In practical terms, significant effects are those which will hamper or conflict with legislation or policy aims, plans or strategies relating to biodiversity and nature conservation. For the purposes of EIA, significant effects are those defined as moderate effects and above.
- 13.3.34 Effects which conflict (or potentially conflict) with wildlife law more widely (e.g., the Protection of Badgers Act 1992²⁰) are also identified (and appropriate mitigation specified) in this assessment, in line with the CIEEM guidelines.

Mitigation and Monitoring

- 13.3.35 'Mitigation' here also includes compensation, enhancement and monitoring.
- 13.3.36 Where significant effects have been identified, the mitigation hierarchy has been taken into account. The CIEEM guidelines set out a sequential approach of avoiding impacts where

possible, applying mitigation measures to minimise unavoidable impacts and then compensating for any remaining impacts. Once avoidance and mitigation measures, and any necessary compensation measures, have been applied, and opportunities for enhancement incorporated, residual effects have then been identified and their significance assessed.

- 13.3.37 Where mitigation and compensation has been proposed, this is proportionate with the geographical scale of an effect. The CIEEM Guidelines provide the following advice: *“mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved”*.
- 13.3.38 The specified mitigation also takes into account the potential of the Site for ecological enhancement and proposes appropriate and reasonable enhancement measures for all ecological features, whether these are necessary for mitigation purposes or not. Monitoring requirements are also considered.
- 13.3.39 Where significant effects have been identified, the mitigation hierarchy has been taken into account. The CIEEM Guidelines set out a sequential approach of avoiding impacts where possible, applying mitigation measures to minimise unavoidable impacts and then compensating for any remaining impacts. Once avoidance and mitigation measures, and any necessary compensation measures, have been applied, and opportunities for enhancement incorporated, residual effects have then been identified and their significance assessed.

Biodiversity Net Gain

- 13.3.40 This assessment has included the use of a biodiversity net gain calculation (see Appendix 13.3) which employed Natural England’s Biodiversity Metric 4.0, an updated metric to 3.0. This assessment used the baseline habitat data for the Site to determine the Site’s current biodiversity value, and translated the illustrative masterplan into appropriate proposed habitats to determine the biodiversity value of the Site under the Proposed Development. It indicates that a biodiversity net gain of over 20% is feasible in the Proposed Development.

Assumptions and Limitations

- 13.3.41 Baseline surveys carried out at the Site have been based on industry standard guidance (where available) and therefore provide a strong and robust basis for the identification of important ecological features. However, since they involve a finite and proportionate number of visits to a site, no surveys can provide absolute confidence about the presence or absence of species at a site, or completely accurate knowledge about the distribution of species across a site.
- 13.3.42 Limitations associated with individual surveys and how these have been taken into consideration to ensure survey results and the assessment are robust are set out in Appendix 13.2.

13.3.43 The assessment is based on baseline survey results that were accurate at the time of survey. However, the baseline can change due to the mobility of some species, changes in land management and natural processes of vegetation succession.

13.3.44 The assessment assumes that mitigation, compensation and enhancement measures that are widely established within the development sectors in the UK are likely to be effective. Where suggested measures are less well established or novel, their potential for failure has been factored into the assessment. Appropriate level of uncertainty and risk in habitat creation are automatically factored into biodiversity calculations using Natural England's Biodiversity Metric.

13.4 Baseline Conditions

Statutory Designated Sites

13.4.1 There are no statutory sites designated for nature conservation within the Site. There are sixteen statutory designated sites within 5km of the Site boundary (listed in Table 13.7 and shown on Figure 13.1); these comprise Oxford Meadows SAC and fifteen Sites of Special Scientific Interest (SSSI). Oxford Meadows SAC is the only internationally designated site within 10km of the Site. Further information on the SSSIs and the SAC is included in Appendix 13.2.

13.4.2 Rushy Meadows SSSI is adjacent to the northern boundary of the Site, separated from it by a stream, bridleway and double hedgerow. The next closest SSSI is Pixey and Yarnton Meads SSSI, 1.8km to the south of the Site. There are no other SSSIs within 2km of the Site. The Site is within the SSSI Impact Risk Zones for Rushy Meadow SSSI and Oxford Meadows SAC.

Table 13.7: Statutory designated sites within 5km of the Site

Site Name	Designation	Overview	Area (ha)	Approx. distance from Site boundary and direction
Rushy Meadows	SSSI	Damp meadow.	8.7	10m NE
Oxford Meadows	SAC	Floodplain grassland, including grazed pasture and hay meadows.	267.4	1.8km S
Pixey and Yarnton Meads	SSSI	Floodplain hay meadows.	85.6	1.8km S
Wolvercote Meadows	SSSI	Floodplain hay meadows.	9.2	2.4km S
Blenheim Park	SSSI	Oak-dominated pasture woodland and lakes.	225.2	2.5km NW

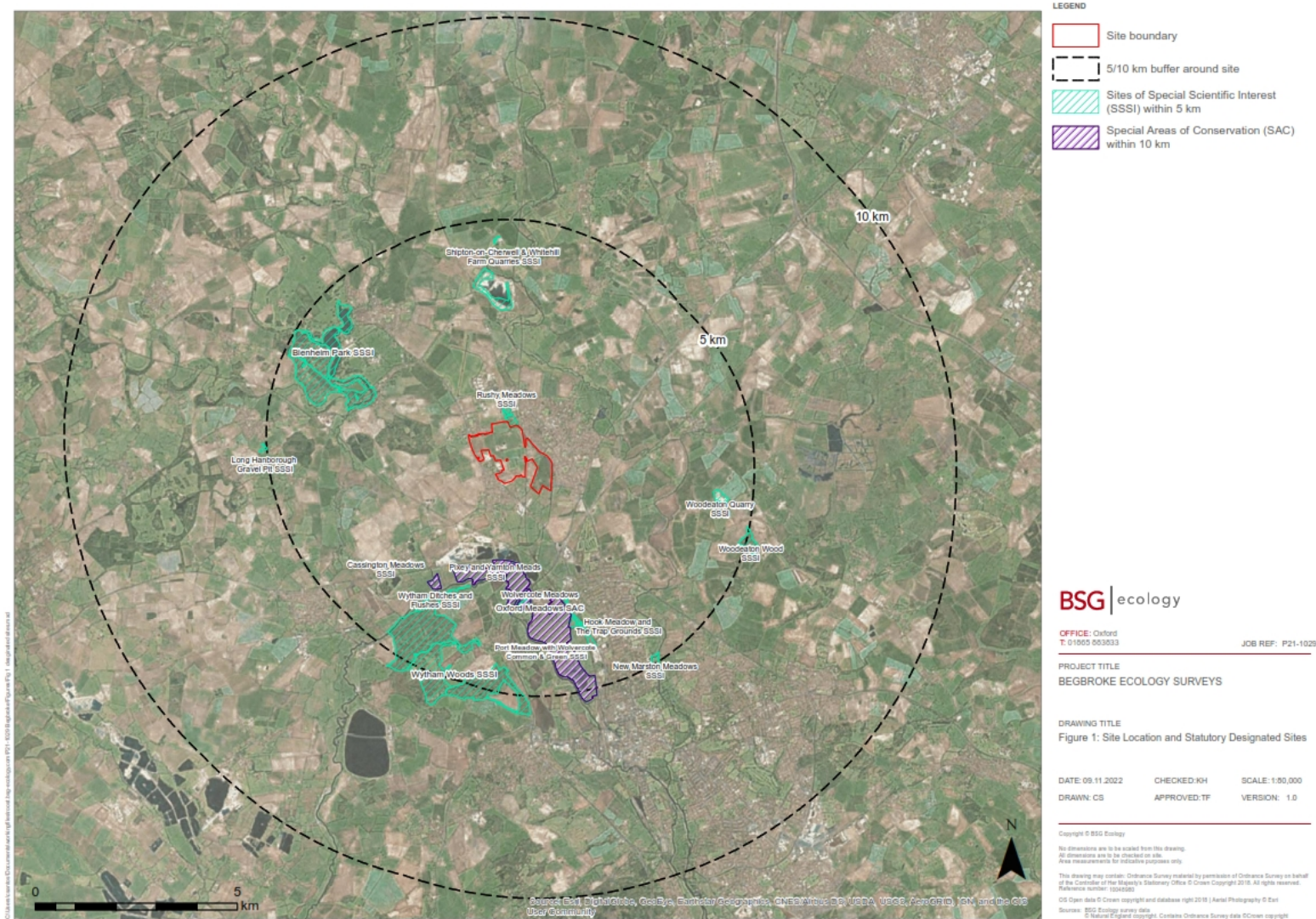
Site Name	Designation	Overview	Area (ha)	Approx. distance from Site boundary and direction
Portmeadow with Wolvercote Common and Green	SSSI	Grazed floodplain grassland.	166.7	2.5km S
Shipton on Cherwell and Whitehill Farm Quarries	SSSI	Notified for its geological interest: white limestone containing abundant and important fossils.	27.7	2.7km N
Wytham Ditches and Flushes	SSSI	Ditches supporting species-rich eutrophic aquatic and fen flora.	5.7	2.7km SW
Cassington Meadows	SSSI	Hay meadows and fen.	7.0	2.8km SW
Hook Meadows and the trap Grounds	SSSI	A series of poorly-drained unimproved neutral meadows.	11.3	3.6km S
Wytham Woods	SSSI	A complex of Ancient Woodland, wood pasture, common land and old limestone grassland.	426.5	3.6km SW
Woodeaton Quarry	SSSI	Notified for its geological interest: a Bathonian section and white limestone formation.	6.4	4.0km E
Shipton-on-Cherwell and Whitehill Farm Quarries SSSI	SSSI	Notified for its geological interest: a section from near the base of the White Limestone up to the Lower Cornbrash (with important fossil reptiles) at Shipton Quarry; and the highly fossiliferous Shipton Member of the White Limestone at Whitehill	4	4.4km N
Woodeaton Wood	SSSI	Woodland forming an intact relic of the ancient Shotover Forest.	14.1	4.8km E

Site Name	Designation	Overview	Area (ha)	Approx. distance from Site boundary and direction
New Marston Meadows	SSSI	A series of agriculturally unimproved neutral meadows on the flood plain of the River Cherwell.	44.4	4.9km SE
Long Hanborough Gravel Pit	SSSI	Notified for its geological interest: This site provides exposures in the gravel of the Pleistocene Hanborough Terrace of the Evenlode Valley.	4.3	5.0km W

¹ Site of Special Scientific Interest, protected under the Wildlife and Countryside Act 1981(as amended)

² Special Area of Conservation, protected under the Conservation of Habitats and Species Regulations 2017 (as amended)

Figure 13.1: Statutory designated sites



Non-Statutory Sites

- 13.4.3 The Site contains one non-statutory designated site: Lower Cherwell Valley Conservation Target Area (CTA), part of which occupies an arable field and a pasture field in the north-east of the Site either side of the railway line and an adjacent tributary of the Rowel Brook. This CTA also extends along the Oxford Canal adjacent to the eastern boundary of the Site. The grassland field to the east of the railway line supports semi-improved neutral grassland known to support reptiles, and adjacent hedgerows.
- 13.4.4 The Site contains no sites listed on Natural England's Ancient Woodland Inventory (which includes ancient replanted woodland sites). There are three such sites within 2km of the Site, listed in Table 13.8. The closest of these is part of Begbroke Wood, ca. 0.6km west of the Site.

Table 13.8: Ancient Woodland within 2km of the Site

Site Name	Approximate distance from Site boundary and direction
Begbroke Wood	0.6km W
Bladon Heath	0.9km W
Worton Heath	1.1km W

- 13.4.5 There are 12 Local Wildlife Sites (LWSs) and two Proposed LWSs within 2km of the Site, listed in full in Table 12 of the Ecology Baseline Report (see Appendix 13.2). The closest of these to the Site are Meadows West of Oxford Canal (0.35km to the west), Begbroke Wood (c. 0.45km west), Langford Meadow (c. 0.85km west) and Bladon Heath (0.85km east). All other LWSs are more than 1km from the Site.
- 13.4.6 There are three non-statutory sites within 2km of the Site: a Woodland Trust Reserve at Stratfield Brake (c. 80 metres east of the Site, beyond the Oxford Canal), a Wildlife Trust Reserve at Oxey Mead (part of Pixey and Yarnton Meads SSSI, c. 1.8km south), and Lakeside Link (c. 1.9km south-east).

Habitats on the Site

- 13.4.7 The main habitats present at the Site are arable land, poor semi-improved grassland, semi-improved woodland, hedgerows, streams, and ditches. Six ponds are present within the Site, as are numerous mature trees, and there are small areas of good semi-improved grassland, scrub, tall ruderal vegetation, amenity grassland, plantation woodland, and hardstanding. Buildings are present at Begbroke Science Park in the centre-north of the Site and at Parker's Farm in the north-east of the Site. Of these habitats, the woodland and hedgerows, and one of the ponds are classified as HPIs.
- 13.4.8 A stream, the Rowel Brook passes east to west through the north of the Site and joins the Oxford Canal which forms part of the Site's eastern boundary. The A44 forms part of the western boundary of the Site, and is likely to present a significant barrier to many species (such as great crested newt and reptiles).

13.4.9 A summary of the on-site habitats is provided in Table 13.9 and these are shown on Figure 13.2. Further details are provided in the Ecology Baseline Report (Appendix 13.2).

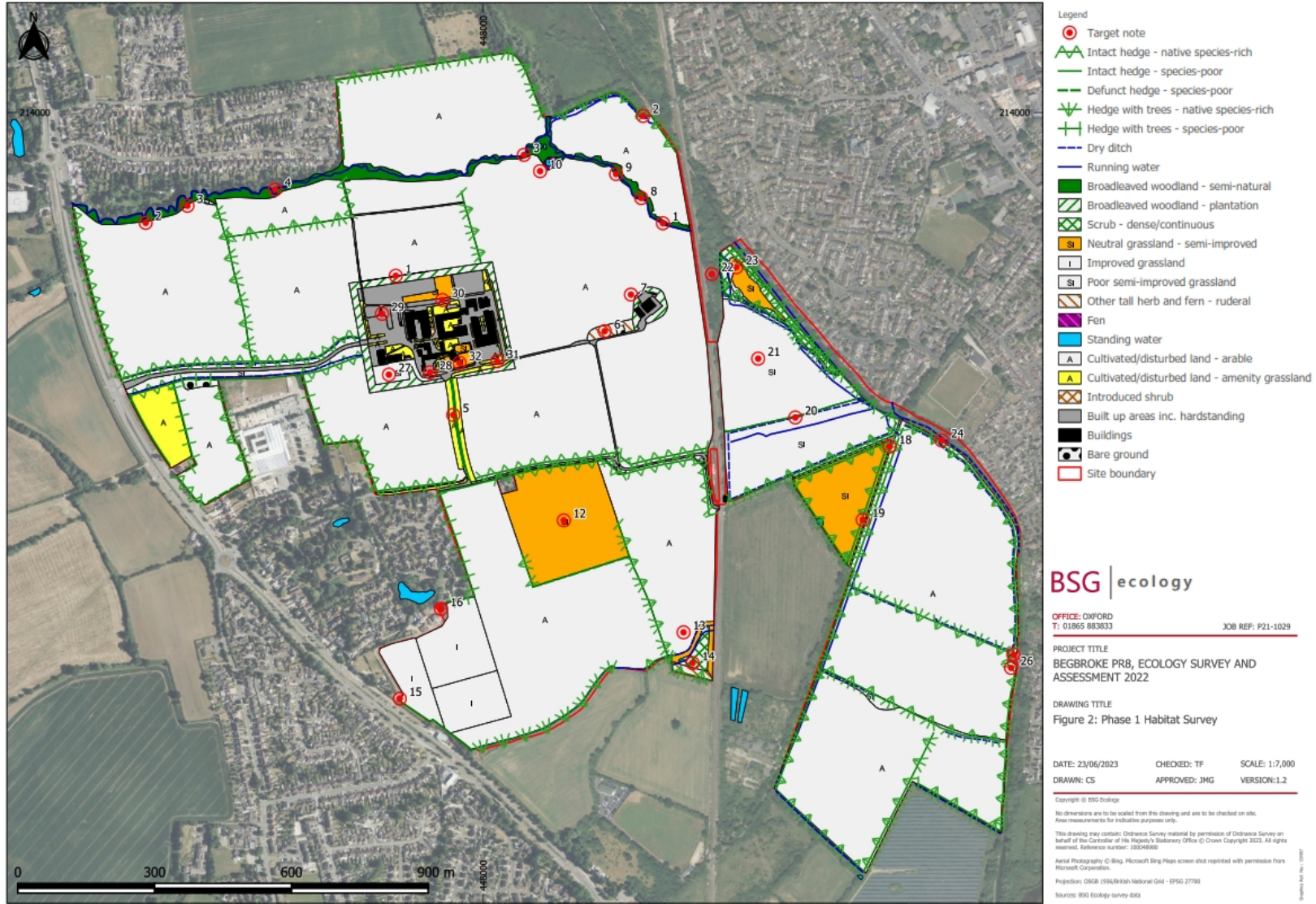
Table 13.9: Habitats on the Site

Habitat	Description	Habitat of Principal Importance
Arable land	The Site is dominated by large arable fields which are of limited ecological value. Crops include winter wheat, barley and oilseed rape. Field boundaries are formed by hedgerows (see below).	No
Good semi-improved neutral grassland	Good semi-improved grassland (equivalent to Other neutral grassland under the UK Habitat Classification) is present in two fields at the east of the Site, the historic landfill site and within a small triangular field in the south of the Site, and at Begbroke Science Park.	No
Poor semi-improved neutral grassland	Several areas of poor semi-improved grassland are present at the Site, including two field in the east of the Site. These have swards heavily dominated by grasses and are equivalent to Modified grassland under the UK Habitat Classification.	No
Improved grassland	An area of improved grassland dominated by perennial ryegrass <i>Lolium perenne</i> with some creeping buttercup <i>Ranunculus repens</i> is present in the south-west of the site. This grassland has a short sward and is used for deer farming. This habitat is equivalent to Modified grassland under the UK Habitat Classification	No
Amenity grassland	Various areas of amenity grassland (lawn) are present around the Science Park and on associated road verges. These are closely mown, and species-poor. equivalent to Modified grassland under the UK Habitat Classification	No
Broad-leaved semi-natural woodland	A corridor of semi-natural woodland follows the Rowel Brook in the north of the Site and also follows a smaller stream which flows into this at the north east of the Site. This woodland contains oak <i>Quercus robur</i> , ash <i>Fraxinus excelsior</i> , abundant sycamore <i>Acer pseudoplatanus</i> in some areas, alder <i>Alnus glutinosa</i> and crack willow <i>Salix fragilis</i>). This woodland is natural in character and has distinct shrub and field layers of native species. This habitat is considered to conform to the description of <i>Lowland Mixed Deciduous Woodland</i> in BRIG (2011) and therefore is a HPI.	Yes
Plantation woodland	A small area of planted woodland containing mixed mature (mainly non-native) trees is present around modern and old barns at Parker's Farm, east of the Science Park. See Photograph 12. There is also a belt of young deciduous planted woodland surrounding the Science Park. Due to its young age, lack of mature canopy or woodland ground flora, and dominance of non-native tree species, this habitat is not	No

Habitat	Description	Habitat of Principal Importance
	considered to conform to the description of <i>Lowland Mixed Deciduous Woodland</i> in BRIG (2011) ²¹ and therefore is not a HPI.	
Hedgerows	There is a network of agricultural hedgerows across the site, mostly dominated by hawthorn but containing a range of native shrub species. Because they are all composed of 80% or more of native species, all of the hedgerows at the Site represent the HPI <i>Hedgerows</i> . Of the 54 hedgerows present at the Site, 38 hedgerows are species-rich, and 31 are considered Important under wildlife and landscape criteria of the Hedgerow Regulations 1997.	Yes
Scrub	Several areas of the Site support areas of dense scrub, dominated by hawthorn <i>Crataegus monogyna</i> and bramble <i>Rubus fruticosus</i> agg., with some blackthorn and other woody species. This habitat is equivalent to mixed scrub in the UK Habitat Classification.	No
Introduced Shrub	Small areas of introduced ornamental shrubs are present within the Science Park.	No
Tall Ruderal vegetation	Tall ruderal vegetation is present as stands of common nettle in the north-east of the Site, and of hemlock <i>Conium maculatum</i> and other species on bunds just east of Parker's Farm.	No
Swamp	A small area of swamp is present within a pond adjacent to the Rowel Brook in the north of the Site, with abundant common reed <i>Phragmites australis</i> . This habitat is considered to be aquatic marginal vegetation rather than reedbed under the UK Habitat Classification, since it is <0.25 ha in extent.	No
Rowel Brook	A small stream, the Rowel Brook, flows west to east across the north of the Site. The stream flows into the Oxford Canal on the north-eastern boundary of the site. A smaller stream flows north-west and enters the Rowel Brook towards the north-east of the Site. A short artificial stream is present at the east of the Site flowing around a lock on the Oxford Canal.	No
Ditches	Ditches are present adjacent to many of the hedgerows at the Site, particularly in the east of the Site.	No
Ponds	Six ponds are present within the Site. Of these, the presence of great crested newts (GCN) makes the pond at Begbroke Science Park a HPI, despite the fact that it is a formal pond with ornamental fish and heavy pumped ultraviolet filtration. The other ponds within the Site do not conform to any of the habitat descriptions in BRIG (2011) and are therefore not HPIs.	Pond at Begbroke Science Park only
Trees	In addition to the woodland described above, there are various mature and semi-mature trees at the Site. The Science Park itself has some mature trees and abundant semi-mature trees.	No

Habitat	Description	Habitat of Principal Importance
	There is also a line of mature poplars on the western boundary of the historic landfill site. In the remainder of the Site, mature trees are only present in woodland or hedgerows.	
Buildings and hard standing	A range of buildings are present at Begbroke Science Park; these include a stone farmhouse and associated buildings and various modern buildings. The only buildings at the Site outside the Science Park are two large modern agricultural barns and a low stone barn or animal shelter, all at Parker's Farm.	No

Figure 13.2: Baseline habitats at the Site



Protected Species

13.4.10 The value of the Site for protected species and other species of conservation significance is summarised in Table 13.10. This includes Species of Principal Importance in England (hereafter ‘SPIs’; as listed by Natural England in accordance with Section 41 of the Natural Environment and Rural Communities Act 2006). Detailed results are provided in Appendix 13.2.

Table 13.10: Value of the Site for protected species and other species of conservation significance

Species	Summary
Badger	<p>Badger setts are present at the Site. The 2022 badger survey identified a very large active main sett towards the centre of the Site. There is an associated large annex sett to the west of the main sett, and several outlier sett / individual holes in the vicinity.</p> <p>As second main sett is present on the north-western Site boundary, which has multiple entrance holes and nearby outlier setts.</p> <p>Outlier setts are also present in the south-west, the south-east and the north of the Site.</p>
Bats	<p>Surveys carried out in 2022 indicate that bat activity at the Site is dominated by common pipistrelle <i>Pipistrellus pipistrellus</i>, soprano pipistrelle <i>Pipistrellus pygmaeus</i> and noctule bat <i>Nyctalus noctula</i>. Other bats recorded comprise Leisler’s bat <i>Nyctalus leisleri</i>, at least one <i>Myotis</i> species, barbastelle <i>Barbastella barbastellus</i>, brown long-eared bat <i>Plecotus auritus</i>, serotine <i>Eptesicus serotinus</i> and Nathusias’ pipistrelle <i>Pipistrellus nathusii</i>. The survey in 2018 recorded small numbers (two passes) of lesser horseshoe <i>Rhinolophus hipposideros</i> on Sandy Lane, but this species was not recorded in 2022.</p> <p>Bat activity is particularly abundant adjacent to woodland along the Rowel Brook in the north of the Site and along Kidlington Lane (which has a double hedgerow with numerous mature trees). Sandy Lane appears to provide important east-west connectivity across the Site for bats, with all of the above nine species recorded using it.</p> <p>Surveys have found two buildings at the Site to support roosting bats, Begbroke Hill Farmhouse and an adjacent building to the south (both at Begbroke Science Park). These support day roosts of low numbers of common pipistrelle.</p> <p>A total of 70 trees within or adjacent to areas of the Site proposed for development have potential to support roosting bats. Two trees have high potential, nine have moderate potential, and 59 have low potential. All other trees within developable areas of the Site have negligible potential. There are numerous further trees within areas of proposed greenspace in the north and east of the Site.</p> <p>A further 14 trees are present adjacent to but outside the southern boundary of the Site. Of these, one has high potential and two have moderate potential to support bats.</p> <p>Surveys of the trees with moderate and high bat potential in the proposed development area of the Site have found no evidence of roosting bats.</p>

Species	Summary
Brown hairstreak butterfly	Presence at the Site was established in 2021, with eggs of this species recorded along two hedgerows at Sandy Lane and a parcel of scrub in the south of the Site.
Other terrestrial invertebrates	The arable land which dominates the Site is unlikely to provide important habitat for invertebrates. Hedgerows, woodland, grassland and mature trees at the Site are likely to support a range of species.
Breeding birds	Surveys in 2022 recorded 34 bird species as confirmed or likely breeding on Site. The list includes a range of common and widespread species, but also includes several SPIs: skylark <i>Alauda arvensis</i> , of which there were 21 territories present, is distributed across the arable land, whilst dunnock <i>Prunella modularis</i> , song thrush <i>Turdus philomelos</i> and house sparrow <i>Passer domesticus</i> were also noted within hedgerows, woodland and scrub. The Schedule 1 species red kite <i>Milvus milvus</i> nests in a tree at Begbroke Science Park.
Wintering birds	Surveys in 2021-2022 indicate that the Site is unlikely to provide important habitat for wintering birds.
Great crested newt	One pond at the Site, located within Begbroke Science Park, supports a small population of great crested newt <i>Triturus cristatus</i> . A peak count of three individuals was recorded during in 2022. Five other ponds at the Site do not support this species. No other evidence of this species was found in any off-site ponds which have habitat connectivity to developable areas of the Site. No access was available to two off-site ponds to the south of the Site, but terrestrial surveys in the part of the Site close to these found no evidence of this species.
Common toad	Common toad <i>Bufo bufo</i> , a SPI, was recorded during the ecology surveys at several locations on the Site. These were Begbroke Science Park, in rough grassland in the south of the Site, and in arable field margins east of the railway line. The various ponds on the Site provide breeding habitat.
Aquatic invertebrates	Aquatic invertebrate surveys carried out in 2022 indicate that the biological quality of the Rowel Brook is Moderate to Fair. The non-native invasive species signal crayfish <i>Pacifastacus lenisculus</i> was found in the Rowel Brook in 2017, but the native white-clawed crayfish <i>Autropotamobius pallipes</i> was found to be absent. There is not considered to be any likelihood of this species having re-colonised the Site.
Dormouse	Surveys in 2018 and 2022 indicate that dormouse <i>Muscardinus avellanarius</i> is unlikely to be present at the Site.
Otter	Otter <i>Lutra lutra</i> is well established along the Oxford Canal. Although there is some potential for otter to use the Rowel Brook for dispersal, it is considered too small to provide foraging territory of this species and no signs of otter were recorded at the Site during surveys in 2022.
Hedgehog	This species was not recorded at the Site, but is considered likely to be present, given that it is present in Yarnton and that the Site provides some suitable habitat (e.g., woodland and hedgerows).

Species	Summary
Brown hare	Observations during various surveys in 2018 and 2022 indicate that brown hare <i>Lepus europaeus</i> is present at the Site in low numbers.
Water vole	Signs of water vole <i>Arvicola amphibia</i> were recorded on the Rowel Brook and an adjacent pond in 2018. However, surveys undertaken in 2022 found no evidence of this species. It is known to be present on the Oxford Canal, and therefore there is potential for it to recolonise the Rowel Brook within the Site.
Reptiles	The arable land which dominates the Site provided poor habitat for reptiles. However, surveys carried out in 2022 found small numbers (of three species: grass snake <i>Natrix helvetica</i> , common lizard <i>Zootoca vivipara</i> , and slow worm <i>Anguis fragilis</i>) to be present in areas of rough grassland and scrub in the north-east corner and in the south of the Site and around Parkers Farm.
Fish	The Rowel Brook has some suitability to support bullhead <i>Cottus gobio</i> which is listed on Annex II of the Habitats directive. Other widespread stream fish could be present, although stream is susceptible to summer drying.
Plants	The arable plants corn marigold <i>Gelbionis segetum</i> and common cudweed <i>Fillago vulgaris</i> were recorded in arable field margins on at the Site. Corn marigold is classified as “Vulnerable” in the England Red List and common cudweed is listed as “Near threatened”. The arable land that dominates the Site has no other significant botanical interest. Some of the grassland areas at the east of the Site and the woodland areas support a low to moderate botanical diversity.

Future Baseline

- 13.4.11 Without the Proposed Development, it is likely that the Site conditions (i.e., continued agricultural use across the majority of the Site) would remain as the current conditions for the foreseeable future. Construction works are currently underway to expand the developed area within Begbroke Science Park and to create a car park (CDC planning application references: 18/00803/OUT and 21/03195/F). These changes at the Science Park have been assumed in the future baseline condition of this assessment and incorporated into the baseline habitats plan (see Figure 13.2).
- 13.4.12 The populations of some species, such as reptiles may not be sustainable over the long term under the baseline management conditions, e.g. due to the poor habitat quality of the pond at Begbroke Science Park, insufficient cover for reptiles over much of the Site, and (in the north-eastern-most field) encroachment and shading by scrub.

Summary of Receptors and Evaluation of Important Ecological Features

- 13.4.13 The value of the ecological receptors that have been scoped-in to this assessment is shown in Table 13.11, based on the CIEEM geographic scale. This also provides justification for their inclusion in the assessment by highlighting potential impacts from the Proposed Development. Features are numbered and this numbering is used throughout further stages of this assessment for ease of reference.

13.4.14 It should be noted that the majority of the species features at the Site are valued at the local level in this assessment. This reflects the current intensive agricultural management which dominates that Site, meaning that the populations of species present at the Site are generally small and/or residual, and some may not be sustainable over the long term under the baseline management conditions.

Table 13.11: Description of Ecological Receptors

Receptor	Geographic level of importance	Justification for inclusion in assessment
<i>Designated Sites</i>		
1. Oxford Meadows SAC	International	Due to its proximity, development at the Site has the potential for significant indirect effects on this site, for example through changes in air quality, water pollution, and/or increases in recreational impacts. There are no other international statutory sites within the 10km Zone of Influence.
2. Rushy Meadow SSSI	National	Due to its proximity, development at the Site has the potential for significant indirect effects on this site, for example, through accidental damage during construction, changes to the SSSI's hydrological regime, water pollution, changes in air quality and/or increased recreational impacts.
3. Other SSSIs	National	The 14 further SSSIs within the 5km Zol have some potential to experience significant effects through increased recreational pressure and/or changes in air quality from increased traffic. SSSIs forming Oxford Meadows SAC have potential for impacts from water pollution.
4. Ancient Woodlands	National	This habitat is considered non-recreatable and receives protection under the NPPF. There are three parcels within 2km of the Site which could potentially experience increased recreational pressure from the Proposed Development. Several parcels are considered in relation to air quality impacts, because they are within 200m of major roads that could experience traffic increases from the Proposed Development.
5. Lower Cherwell Valley CTA	District	The purpose of CTAs is to identify areas within the district that are particularly suited to habitat creation in the future. Development at the Site has the potential for significant direct effects on this aim if it results in land use that conflicts with the CTA habitat objectives, or leads to indirect effects on this habitat via recreation or air quality.
6. Other non-statutory sites	District	The 17 non-statutory sites within the Zol have some potential to experience significant effects through increased recreational pressure and/or changes in air quality from increased traffic.

Habitats

Receptor	Geographic level of importance	Justification for inclusion in assessment
7. Grassland	Local	Various types of grassland are present on the Site, none of which are designated as a HPI or a statutory or non-statutory site. Development at the Site has the potential for direct effects (e.g., habitat loss, reduction in extent or habitat quality during construction) and indirect effects (e.g., increased recreational pressure) on this habitat.
8. Woodland	Local	There are parcels of both broad-leaved semi natural woodland and plantation woodland on-site, some of which is considered to be a HPI. However, its value is limited by the minimal presence of woodland ground flora and mature trees, and the abundance of non-native species. In the context of numerous sites of Ancient Woodland being present in the district, this woodland is of local value for this assessment. The Proposed Development has the potential for direct effects (e.g., habitat loss, reduction in extent or habitat quality during construction) and indirect effects (e.g., increased recreational pressure) on this habitat.
9. Hedgerows and ditches	Local	All of the hedgerows at the Site are consider a HPI, although HPI hedgerows are widespread across the district. The hedgerow network on the Site likely provides important ecological connectivity at the site and local level. Ditches provide a similar level of local habitat connectivity, and are generally associated with hedgerows at the Site, and so the two habitats are considered under one feature. This network is considered of local importance. The Proposed Development has the potential to cause loss or reduced connectivity in this network, and pollution of ditches.
10. Rowel Brook and Oxford Canal	Local	This habitat is not an HPI, but it provides flowing water habitat, which has limited re-creatability, provides potential habitat for water vole, supports an invertebrate assemblage (which is included within this feature, rather than separated out), and provides local habitat connectivity. The Proposed Development has the potential for direct effects (e.g., habitat loss, reduction in extent or habitat quality during construction) as well as indirect effects including pollution and scouring from new surface water discharges.
11. Ponds	Local	Six ponds are present within the Site and of these, one (the ponds at Begbroke Science Park) is a HPI (because it contains Great crested newts). These ponds provide habitat for a range of species, although their ecological value is limited by shading and silting. The Proposed Development has the potential for direct effects (e.g., habitat loss, reduction in extent or habitat quality during construction) as well as indirect effects including pollution or dumping of non-native flora and fauna (e.g., unwanted pond fish or pond plants).
12. Isolated trees	Local	There are various mature trees across the Site most of which are associated with hedgerows and or woodland parcels (and so are assessed under those features). However, isolated trees are present at Begbroke Science Park,

Receptor	Geographic level of importance	Justification for inclusion in assessment
		and provide habitat of local value, particularly for invertebrates and nesting birds. The Proposed Development has the potential to cause loss of or damage to these trees.
13. Arable plants	Local	Arable plants corn marigold and common cudweed were recorded in arable field margins on-site. Corn marigold is classified as “Vulnerable” in the England Red List and common cudweed is listed as “Near threatened”. Development of arable land at the Site has the potential to eradicate these species from the Site, and potentially, if they are not present nearby, from the local area.
<i>Species</i>		
14. Badger	N/A	Badger and their setts are a legally protected (on animal welfare grounds). It is not of particular conservation significance, being common and widespread in the UK. Since badger setts are present at the Site, the Proposed Development has the potential for significant direct effects on badgers and their setts (e.g. loss of setts and killing or injury to individuals during construction) resulting in breach of wildlife legislation, and it is therefore included in this assessment.
15. Bats	Local	All UK bats are European protected species. The Site provides foraging and commuting habitat for at least nine species of bat. Of these, four species are also species of principal interest (SPI). On-site habitats are likely to significantly contribute to local habitat connectivity for bats. The Site also supports two building roosts for common pipistrelle, and trees suitable for roosting. The Proposed Development has the potential for significant direct effects on bats (e.g., loss or degradation of roosting, foraging and commuting habitat and loss of individuals during construction), and indirect effects (e.g., degradation of habitats through light pollution during the occupation phase). These effects could lead to reductions in populations and species distributions and reduced habitat connectivity.
16. Water vole	Local	Water vole and its burrows are protected under the Wildlife and Countryside Act 1981 (as amended) and it is a SPI. It is known to reside within the Oxford Canal and the Site provides suitable habitat (although no evidence of its presence was found in the most recent survey). The Proposed Development has some potential for significant direct effects on water vole e.g., killing or injury to individuals on the Site, during works to or near the Rowel Brook and the Oxford Canal. Increased recreation or dog walking near the Rowel Brook could cause disturbance.
17. Otter	Local	Otter is a European Protected Species and an SPI. Although not recorded on Site, the Rowel Brook and its tributary could provide supporting or dispersal habitat for this species as they are well established on the Oxford Canal. The potential for impacts is similar to those for water vole.

Receptor	Geographic level of importance	Justification for inclusion in assessment
18. Hedgehog	Local	Hedgehog is an SPI likely to be present at the Site. The Proposed Development has the potential for significant direct effects on hedgehog including killing and or injuring individuals, trapping of individuals within excavations, loss of and or reduction in habitat, and impacts from increased traffic post-construction.
19. Brown hare	Local	This SPI present at the Site. The Proposed Development has the potential for to cause a reduction in habitat availability for this species through the loss of arable land, and increased recreational pressure on greenspaces.
20. Breeding birds	Local	The Site supports a range of breeding bird species, including several SPIs (particularly farmland birds), red and amber-listed species, and nesting red kite, a Schedule 1 species. All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), including protection from disturbance for Schedule 1 species. The Proposed Development has the potential to cause significant direct effects on individual breeding birds (e.g., loss of individuals and of habitat supporting this species during construction) and to reduce and also indirect effects (e.g. increased predation from domestic cats in retained hedgerows), resulting in reduced populations locally. Local Plan Policy PR 8 requires development at the Site to include compensation for farmland birds.
21 Great crested newt (GCN)	Local	GCN are a European Protected Species and an SPI. The Site supports one small breeding population in the pond at Begbroke Science Park. The pond is sub-optimal for this species and there does not appear to be any connectivity to other breeding sites. For this reason, this population may have limited future viability. The Proposed Development has the potential to cause impacts on individuals of this species, and the loss of this population.
22. Common Toad	Local	Common toad is an SPI, for which the Site provides suitable habitat, although current intensive agricultural management of the majority of the Site makes it sup-optimal for this species. The Proposed Development could impact individuals, reduce its population at the Site and destroy breeding sites.
23. Brown hairstreak butterfly	Local	This is an SPI, for which the Site provides some suitable habitat, although current agricultural management of the hedgerows and the limited extent of scrub makes it sup-optimal for this species. The Proposed Development could reduce or destroy its population there.
24. Reptiles	Local	The Site supports low numbers of reptiles, since the majority of habitat is poor for these species. The Proposed Development has the potential to cause impacts on individuals, loss of habitat and habitat connectivity, increased disturbance from recreation and dogs, and increased predation from cats. There is potential for the small residual populations of reptiles to be lost from the Site.

Receptor	Geographic level of importance	Justification for inclusion in assessment
25. Net biodiversity value of the Site	Local	Developments are required to achieve a net gain in biodiversity under Local Plan Policy ESD 10. The net biodiversity impact of the Proposed Development will need to be assessed in order to ensure that that development is consistent with the guidance on measurable biodiversity gain in the NPPF and the biodiversity gain requirements of Cherwell Local Plan Policy PR8.

13.5 Embedded Mitigation (Scheme Design and Management)

13.5.1 Ecological mitigation is embedded into the Proposed Development through consideration of site layout, setbacks and other inherent masterplanning design measures set out below. Additionally, ecological mitigation controls have been set out in supporting management documents, including the Outline CEMP, Outline LEMP, Outline Lighting Strategy, and the Drainage Strategy (in the FRA). These documents are to be secured by planning condition.

Construction

13.5.2 The Outline CEMP sets out key ecological protection measures for the construction phase, including the following:

- Pollution prevention measures, protection measures for nesting birds and reptiles during clearance works.
- Protection measures (e.g., fencing) for retained hedgerows, ponds, trees and other retained habitats, and for watercourses during clearance and construction.
- Protection measures for nesting birds. Where possible, avoiding any clearance of vegetation (including shrubs, hedgerows, trees, grassland and crops) within the bird breeding season (March to August inclusive). Any areas to be cleared within the above period would only be cleared following advice from a professional ecologist.
- Protection measures for reptiles (such as slow worm) and amphibians (such as common toad) during clearance works, to involve two stage cutting of vegetation and or destructive searches by a suitably experienced ecologist, with any captured animals being move to suitable retained or new habitats at the Site.
- General measures to avoid excessive noise or vibration, or light spill.

Completed Development

13.5.3 The design of the Proposed Development has been iterative and has followed the mitigation hierarchy. As such, the Proposed Development has been designed to avoid and retain important ecological features including boundary hedgerows and trees to ensure they can be managed long-term to maximise their biodiversity potential. Where this is not possible, new habitats are proposed (see Development Areas and Land Use, and Green Infrastructure Parameter Pla) to deliver overall biodiversity gain.

13.5.4 The Parameter Plans, Development Specification and Strategic Design Guide set out details of broad habitat creation and management measures that will take place across the Proposed Development. Further detail is provided through the Outline LEMP. These include:

- Grassland, woodland and scrub habitats in the proposed LNR in the north of the Site.
- Floodplain meadow grassland in the Nature Conservation Area in the north-east of the Site (and retention and enhancement of the northernmost grassland field in this location).

- Extensive grassland habitat (some accessible, and other areas without public access to maximise their value for farmland species such as skylark and brown hare) in the east of the Site, south of Sandy Lane. This includes a specific skylark mitigation of ca. 10 ha of grassland.
- Retention of existing hedgerows, trees, ponds, and dark conditions suitable for bats, within areas of greenspace.
- Retention of hedgerows (and dark conditions suitable for bats) along Sandy Lane and Kidlington Lane in the south of the Site, and along Begbroke Lane in the north of the Site.
- Retention and enhancement of the Rowel Brook and its tributary.
- Retention of the ditch along the southern boundary of the Site, including a 5m dark buffer of native vegetation.
- Retention of the Begbroke Hill Farmhouse complex, and lighting in its vicinity that will be designed to be sensitive to bats.
- Creation of dark and green habitat corridors, suitable for bats between Sandy Lane and Begbroke Science Park, and between Begbroke Science Park and the Rowel Brook.
- Provision of bat boxes incorporated into the walls of new buildings (equivalent in number to 20% of new dwellings).
- Provision of bird boxes incorporated into the walls of new buildings (equivalent in number to 20% of new dwellings).
- Provision of native vegetation within SuDS to provide pond edge and damp grassland habitats.
- Creation of six new ponds, not connected with any drainage function, in the north and east of the Site, to provide habitat.
- Creation of six new wetland scrapes in inaccessible areas in the east of the Site to provide habitat for wetland birds.

13.6 Assessment of Effects – Construction Stage

- 13.6.1 Tables 13.12 assess the impact of the construction effects of the Proposed Development on each of the 25 important ecological features, taking into account the embedded mitigation set out in Section 13.5 and the Outline CEMP. Where habitat areas are mentioned, these have been taken from the baseline page of the biodiversity calculation for the Site (see Appendix 13.2).

Table 13.12: Construction Phase Effects

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
1. Oxford Meadows SAC	Water-borne pollution	Water-borne pollution from spillage of oils, fuels, lubricants, cement or silt	Mitigation measures in the Outline CEMP are sufficient to avoid significant accidental habitat impacts from water-borne pollution during construction works. Given standard welfare facilities (i.e., treatment of on-site toilet waste through the existing sewerage system, either by removal of wastes offsite or an onsite connection), water quality impacts will be negligible.	Negligible adverse
		Reduction in agricultural run-off	The Proposed Development will displace a large area of intensively managed arable land, currently with no specific treatment of surface water runoff, with residential land that will have its surface water treated via SuDS, and by greenspace. There will be consequential reductions in the runoff of agricultural fertilisers, herbicides and pesticides, and in potentially also of eroded soil into the Thames catchment, reducing pollution potential at the downstream SAC.	
	Aerial pollution	Dust and vehicle emissions during construction.	Given the distance between the Site and the SAC, there is no potential for impacts on the SAC from on-site emissions. Chapter 11: Air Quality of this ES indicates that traffic levels on surrounding roads from construction works will be well under Natural England's 1000 AADT screening threshold. There, there is no potential for significant impacts from aerial pollution.	
2. Rushy Meadows SSSI	Habitat degradation	Aerial pollution via dust during site clearance and construction works	Given the distance between the SSSI and the parts of the Site proposed for built development, and the double hedgerow barrier, the potential for impacts from dust is considered to be low, limited to that arising from any works	Minor beneficial – due to the extent of habitat creation in

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			to the bridleway on the northern boundary of the Site, or mechanical works to create the community farm/allotments. Dust impacts are considered further in Chapter 11: Air Quality of this ES, and various dust mitigation measures are included in the Outline CEMP.	proximity to the SSSI, and its likely positive effect on habitat connectivity for the SSSI
		Water-borne pollution during construction works	<p>The SSSI is separated from the Site by Begbroke Lane, a bridleway and double hedgerows, c. 10 metres in width. About half of the boundary between the Site and the SSSI is also separated by a watercourse. Construction works in proximity to the SSSI will be very limited, since this area is allocated as greenspace and there will not be any built development proposed within c. 150m of the SSSI, nor any upstream of it.</p> <p>Protection measures in the Outline CEMP are sufficient to avoid significant accidental habitat impacts during construction. Therefore, the potential for waterborne pollution from the Site to reach the SSSI is considered to be negligible.</p>	
		Hydrological or hydrological effects due to construction of buildings, hardstanding and other impermeable features.	Hydrological analysis within this EIA (see Chapter 16: Water Resources and Flood Risk and Appendix 15.1 Desk Study Review and Ground Investigation) indicates that there is no hydrological or hydrogeological linkage between the Site and the SSSI and that there is negligible risk of the Proposed Development affecting SSSI.	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
		Damage to SSSI from access or litter during construction	Given the lack of any public access to the SSSI, and the fact that the SSSI is not in close proximity to construction areas of the Site, damage from access or litter is considered unlikely.	
		Accidental damage by machinery during clearance or construction works	The potential for direct damage to the SSSI during construction works is considered to be very limited, since it is separated from the Site by a bridleway and two hedgerows (and for half of the Site boundary, by a watercourse). Protection measures in the Outline CEMP which include fenced protection of retained habitats during construction, are considered sufficient to avoid significant impacts.	
	Change in habitat connectivity	Habitat losses in the vicinity of the SSSI	Habitat losses in the vicinity of the SSSI will be limited to loss of arable land, which will have negligible impact on the SSSI.	
		Habitat creation and enhancement in the north and east of the Site	The proposed greenspace creation in the north of the Site (i.e., habitats created there during the landscaping phase of construction) is likely to provide increased connectivity between the SSSI and wet grassland habitat. This is considered likely to be beneficial to the SSSI at the local level.	
3. Other SSSIs	Waterborne pollution	Water-borne pollution from spillage of oils, fuels, lubricants, cement or silt.	Given the distance between the Site and these SSSIs (at least 1.8km) and the lack of watercourse connectivity, there is not considered to be any potential for adverse effects from construction activities on them. The construction effect on other SSSIs is therefore considered to be neutral.	Neutral

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	Aerial pollution	Dust and vehicle emissions during construction.	Given the distance between the Site and the other SSSIs, there is no potential for impacts on the SAC from on-site emissions. Chapter 11: Air Quality of this assessment indicates that traffic levels on surrounding roads from construction works will be well under NE's 1000 AADT screening threshold.	
4. Ancient Woodlands	Aerial pollution	Dust and vehicle emissions during construction.	Given the distance between the Site and the Ancient Woodland, there is no potential for impacts from on-site emissions. Chapter 11: Air Quality of this assessment indicates that traffic levels on surrounding roads from construction works will be well under NE's 1000 AADT screening threshold. There is therefore no potential for significant impacts from aerial pollution.	Neutral
	Any	Any	Given the distance between the Site and Ancient Woodland sites (0.6km – 1.1km), there is not considered to be any potential for any other adverse effects from construction activities.	
5. Lower Cherwell Valley CTA	Habitat changes	Landscape works	All of the CTA is within areas proposed for greenspace in the Parameter Plan - Green Infrastructure Plan, specified as a Local Nature Reserve west of the rail line, a Nature Conservation Area east of the rail line, and within the proposed Rowel Brook Park in the north of the Site. The Strategic Design Guide indicates that these areas will be damp grassland, scrub, wet woodland and floodplain grassland, with some wetland scrapes. The conversion of the area from agricultural use to nature conservation use would provide ecological benefits in line with CTA objectives. Given the current arable land use in this area,	Moderate beneficial

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			there is unlikely to be any short-term adverse effect from vegetation clearance. The habitat creation works associated with the construction phase of the Proposed Development likely to have a beneficial effect on the CTA at the district level.	
6. Other non-statutory sites	Water-borne pollution	Water-borne pollution from spillage of oils, fuels, lubricants, cement or silt.	Several of the non-statutory sites (e.g., Stratfield Break, North Meadow West of Canal, and Meadows West of the Oxford Canal) are on or near the Oxford Canal, downstream of the Site. Protection measures in the Outline CEMP are considered sufficient to avoid significant accidental habitat impacts from waterborne pollution during construction. Also, pollution would need to happen during times of severe flood (such that the Oxford Canal was overtopping its banks at these sites) in order for this pollution to be deposited, and such flood conditions would heavily dilute any pollution and would be likely to move it downstream from the sites. Overall, the potential for adverse effects on these sites is therefore considered negligible.	Negligible adverse
7. Grassland	Habitat loss and/or degradation	Clearance for development	The Green Infrastructure Parameter Plan and the Strategic Design Guide indicate that extensive areas of semi-natural grassland will be included in the Proposed Development, outweighing the losses of this habitat that will occur at the Site. The area of grassland to be lost, such as at the historical landfill site in the centre of the Site, the triangular field between Sandy Lane and Begbroke Lane in the east of the Site, and an area at Begbroke Science Park are of moderate (rather than high ecological value). The proposed greenspace creation includes much greater areas of	Minor beneficial – given the extent of new grassland creation that has been designed into the Proposed Development

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			grassland, with good potential to achieve high ecological value. The creation of grassland habitat in Rowel Brook Park (south) in the north of the Site, a high value conservation area in the east of the Site, meadows adjacent to the Oxford Canal, and a 10 ha skylark mitigation area (all of which are embedded mitigation) are considered likely to achieve a beneficial effect on grassland habitats at the local level.	
		Accidental damage during construction works, from machinery or storage of materials	Adverse impacts from accidental incursion of machinery or storage of machinery and/or materials are possible, but considered unlikely, since the Outline CEMP includes measures to protect the areas of grassland that are to be retained from accidental damage during construction.	
8. Woodland	Habitat loss and/or degradation	Intentional clearance for development	The majority of woodland at the Site will be retained and enhanced under the Green Infrastructure Parameter Plan and the Strategic Design Guide. This includes the woodland along the Rowel Brook, and the plantation woodland at Parker's Farm. Approximately 1.6 ha of young native plantation woodland forming a screening belt around Begbroke Science Park may be lost for the Proposed Development. New woodland creation at the Site will be several times greater than this loss, and the Strategic Design Guide indicates that this will comprise native species, which understorey and ground layer planting, making it of greater habitat value once established.	Minor beneficial – given the losses of woodland are limited to non-native plantation, and the new woodland that has been designed into the Proposed Development near the Rowel Brook
		Accidental damage during construction works, from machinery or storage of materials	Adverse impacts from accidental incursion of machinery or storage of machinery and/or materials are possible, but considered unlikely, since the Outline CEMP includes measures to protect retained trees during construction.	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
9. Hedgerows and ditches	Habitat loss, degradation and loss of habitat connectivity	Clearance for development	The Green Infrastructure Parameter Plan shows that hedgerows will be retained in parts of the Proposed Development (e.g., along Sandy Lane, in the east of the Site, and along the southern boundary of the Site). However, as a worst case it is assumed that hedgerows within the Development Zones could be all or largely lost. Adverse impacts could arise on retained hedgerows from inadequate buffers of adjacent habitat, reducing their value as habitat corridors, or preventing access for management. On a precautionary basis, without specific mitigation (i.e., hedgerow translocation or compensatory hedgerow planting) a significant extent of the hedgerow at the Site could be lost.	Moderate adverse – in part because of the large reductions in habitat connectivity that it could cause in the area between Begbroke and Kidlington, and in part because of the extent of HPI loss
		Accidental damage during construction works, from machinery or storage of materials	There is some potential for accidental damage to hedgerows at the Site, even if they are to be retained, e.g., from accidental incursion of machinery or storage of machinery and/or materials. Adverse impacts from accidental incursion of machinery or storage of machinery and/or materials are possible, but considered unlikely, since the Outline CEMP includes measures to protect hedgerows that are to be retained from accidental damage during construction.	
10. Rowel Brook and Oxford Canal	Habitat loss, degradation and loss of habitat connectivity	Physical damage during construction and greenspace works	The Rowel Brook is set entirely within the areas of proposed greenspace in the Development Areas and Land Use and Green Infrastructure Parameter Plans. A pedestrian/bike crossing will be installed. Much of the proposed new greenspace is on current intensively farmed arable land. Conversion of this to grassland, scrub or woodland habitat would provide ecological benefits. Therefore, it is considered unlikely that these watercourses will be damaged through	Minor beneficial – due to the level of increased habitat connectivity along the watercourses,

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			intentional adverse modifications to this course, banks or surrounding habitats, with a negligible effect from these works.	and the replacement of nearby arable land with greenspace
		Accidental damage during construction works, from machinery or storage of materials	There is some potential for accidental damage to the section of Rowel Brook within or immediately adjacent to the Site, e.g., from accidental incursion of machinery or storage of machinery and/or materials. Given the protection measures in the Outline CEMP, this is considered possible, but unlikely.	
		Water-borne pollution from spillage of oils, fuels, lubricants, cement or silt	Given the watercourse protection and pollution prevention measures in the Outline CEMP, the potential for accidental damage to the Rowel Brook during construction works is considered to be low. If such impacts occur, they would be temporary, and unlikely to extend beyond the construction phase.	
11. Ponds	Habitat loss and degradation	Clearance for development	The pond at Begbroke Science Park is likely to be lost as part of the Proposed Development. The five other ponds at the Site are within areas indicated as retained or enhanced greenspace on the Parameter Plans. The Outline LEMP sets out their retention and enhancement measures and also specifies the creation of six new wildlife ponds within greenspace at the Site (in addition to SuDS ponds and six wetland scrapes), thereby doubling the baseline number of ponds, considered beneficial at the local level.	Minor beneficial – given the overall increase in quality and quantity of this habitat
		Accidental damage during construction works, from machinery or storage of materials	Given the protection measures for retained habitats in the Outline CEMP, the potential for accidental damage to the Rowel Brook from during construction is considered to be low. If such impacts occur, they would be temporary, and	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			unlikely to extend beyond the construction phase. Such impacts are considered negligible.	
		Water-borne pollution from spillage of oils, fuels, lubricants, cement or silt	Given the protection and pollution prevention measures in the Outline CEMP, the potential for accidental damage to retained ponds from during construction works is considered to be low. If such impacts occur, they would be temporary, and unlikely to extend beyond the construction phase.	
12. Isolated trees	Loss and damage	Clearance for development	There is potential for a loss of mature trees at Begbroke Science Park and at the historical landfill site south of Sandy Lane. These are mature (but not veteran) and most are non-native. Trees associated with hedgerows are considered under <i>Hedgerows and ditches</i> above and trees associated with woodland are covered under <i>Woodland</i> above. Because of the time taken to reach maturity, mature trees are considered to be a non-re-creatable habitat on development timescales. However, over a longer timescale, the extensive planting of native trees indicates that the ecological value of the tree resources at the Site is likely to increase over the longer term.	Minor adverse
	New tree planting	Landscaping works	Tree planting within the Proposed Development will provide future opportunities for a variety of species, including invertebrates and birds. These will however not compensate for the loss of mature trees lost in the short term, given the time it will take for them to establish and mature.	
13. Arable plants	Habitat loss	Site clearance	Arable plant species of nature conservation value at the local level have been recorded at the Site in areas indicated for built development and are not present elsewhere at the	Minor adverse

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			Site. Therefore, without mitigation, these species will likely be lost from the Site. This impact is considered to be adverse at the local level.	
14. Badger	Killing or injury or disturbance of badgers and damage or destruction of its setts.	Clearance for development, and construction works in proximity to setts	Without licensed badger mitigation works, development works at the Site, including habitat creation works within greenspace are likely to kill, injure and or disturb badgers across the Site, and to destroy the majority of badger setts there. There is potential for impacts from digging required in landscaping and habitat creation works. These actions could lead to a breach in wildlife legislation (the Protection of Badgers Act 1992 and the Protection of Wild Mammals Act 1996). There would not be conservation impact, since badger is a common and widespread species cross the UK, and would likely quickly re-colonise the Site, hence the impact is considered neutral in conservation terms.	Neutral
	Animals becoming trapped or routes severed by fencing	Installation of site fencing	Without badger gates in new fencing within and surrounding greenspace areas, there is potential for badger movements to be restricted and for badgers to become trapped at the Site.	
	Animals becoming trapped in trenches, pipes and holes	Construction works	Without protection measures, there is potential for badgers to be killed or injured through them becoming trapped in trenches, open pipework and holes created during construction works.	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	Loss of foraging habitat	Site clearance and habitat works	The Proposed Development will result in a loss of some existing habitat used for foraging by badger, mainly arable fields. However, given the extent of proposed greenspace that is indicated in the Parameter Plans, there is not expected to be an overall reduction in foraging opportunities for badgers across the Site.	
15. Bats	Reductions in populations through loss of foraging and connecting habitat	Tree felling for development	<p>In the centre, west, and south of the Site, the Proposed Development will result in the replacement of areas of arable land with areas of urban and suburban development. Since arable land provides poor foraging habitat for bats, this change in habitats is likely to be of limited importance for local bat population. The Proposed Development also has the potential to cause the loss of hedgerows in these areas, which is likely to result in reduced foraging opportunities and habitat connectivity in this part of the Site.</p> <p>Current habitat corridors at the Site that are extensively used by bats include the woodland corridor along the Rowel Brook, and the double hedgerows along Sandy Lane and Yarnton Lane. These will be retained in the Proposed Development. The corridor (comprising hedgerows) that links the Rowel Brook south, via Begbroke Science Park, to Sandy Lane, may be lost to development, but the Green Infrastructure Parameter Plan indicates that green arteries will replace this north-south link, and will also provide an east-west habitat corridor via the Science Park.</p> <p>The Proposed Development will also bring forward extensive greenspace as illustrated in the Parameter Plans, including Rowel Brook Park, a Nature Conservation Area, and greenspace along the Oxford Canal in the south of the Site.</p>	Minor beneficial – given the extent of new habitat creation and bat boxes, the controls on lighting, and the negligible loss of roosting habitat and habitat connectivity above the site level

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			Therefore, the availability of foraging habitats, and the level of habitat connectivity for bats are likely to increase across the Site from the Proposed Development, providing a benefit to bat populations at the local level.	
		Floodlighting during construction phase	Impacts of flood lighting during construction on bat corridors is likely to be avoided under the measures set out in the Outline CEMP.	
	Reduced population through loss of roosting habitat.	Building demolition	Buildings supporting roosting bats will not be directly affected by demolition works associated with the Proposed Development.	
		Tree felling during construction works	No known tree roosts will be lost in the development. However, trees within the developable areas of the Site (as defined by the Development Areas and Land Use Parameter Plan) will need to be felled, such as at Begbroke Science Park and adjacent to the historical landfill site south of Sandy Lane. Surveys have not found evidence of roosting bat in these trees, but there is still some residual risk of roosting bats being present, and without adequate mitigation prior to and during felling, there is some potential for the destruction of bat roosts, which would be breach of legislation.	
		Floodlighting during construction	Without adequate additional mitigation relating to floodlighting during construction, there is some risk of roosts being lit with artificial lighting, causing damage to roosts.	
	Provision of new roosting habitat	Installation of bat boxes	The provision of bat boxes (equal in number to 20% of new residences) would provide a large new resource of potential bat roosting sites within the Proposed Development. This,	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			combined with the habitat creation mentioned above (which has the potential to provide and enhance bat roosting opportunities), is considered sufficient to provide a beneficial effect on bats roosting opportunities at the local level.	
	Reduced population caused by killing and injury of individuals	Site clearance	Felling or other works to trees during construction have the potential (without mitigation) to cause the killing or injury of small numbers of bats. Surveys have not found evidence of roosting bat in these trees, but there is still some residual risk of roosting bats being present, and without adequate mitigation prior to and during felling, there is some potential for the killing, injury or disturbance of bats during construction. Without appropriate mitigation, there is potential for breach of legislation relating to the protection of bats and bat roosts.	
16. Water vole	Reductions in populations through loss of habitat and habitat connectivity	Clearance for development	Water vole were not recorded on the Site in the most recent survey, but this species is likely to be present in the Oxford Canal adjacent on the eastern boundary of the Site. The embedded mitigation includes the retention and enhancement of the Rowel Brook, five of the six ponds on the Site, and the ditches in the east of the Site. It also includes the creation of extensive greenspaces adjacent to the Rowel Brook and the Oxford Canal, including marshland and wet meadows, a doubling in the number of ponds at the Site, and the creation of SuDS wetland. Therefore, the extent and connectivity of habitat suitable for this species will increase under the Proposed Development. Given the extent of greenspace around watercourses, adverse effects via habitat impacts are considered unlikely.	Minor beneficial

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	Killing or injury of individuals and destruction of burrows and/or disturbance of individuals	Clearance for development	The proposed design does not include built development on or in proximity to areas suitable for water vole, except for a short section of wet ditch in the south of the Site, from which 2022 surveys indicate that this species is absent.	
		Habitat creation and other works landscaping works within proposed greenspace	Works in close proximity to the Oxford Canal and Rowel Brook (such as path or bank upgrades) could cause injury, killing or disturbance of individual water voles or destruction of their burrows if this species colonises these areas prior to construction (although it is currently absent from them). Without appropriate mitigation, there is some potential for a breach in wildlife legislation protecting water voles and their burrows. Given the extent of new greenspace and wetland habitat that will be created, the effect of the construction on bats is considered to be beneficial for water vole at the site level.	
17. Otter	Reductions in populations through loss of habitat and habitat connectivity	Intentional clearance for development	Otter are not recorded as present on the Site but are likely to be present in the Oxford Canal adjacent on the eastern boundary of the Site. The embedded mitigation includes the retention and enhancement of the Rowel Brook, five on the six ponds at the Site, and ditches in the east of the Site. It also includes the creation of extensive greenspaces adjacent to the Rowel Brook and the Oxford Canal, including marshland and wet meadows, a doubling in the number of ponds at the Site, and the creation of SuDS wetland. Therefore, the extent and connectivity of habitat suitable for this species will result in a beneficial effect on this species.	Minor beneficial
	Killing or injury of	Intentional clearance for development	Works in close proximity to the Oxford Canal and Rowel Brook (such as path or bank upgrades) could cause injury,	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	individuals and destruction of burrows and /or disturbance of individuals	Habitat creation and other works landscaping works within proposed greenspace	killing or disturbance of individual otters or destruction of their holts (burrows), if this species colonises these areas prior to construction (although it is currently absent from them). Without appropriate mitigation, there is some potential for a breach in wildlife legislation protecting water voles and their burrows.	
18. Hedgehog	Reductions in populations through loss of habitat and habitat connectivity	Site clearance and construction, landscaping	Given numerous records from the vicinity, this species is assumed to be present on the Site, although the intensive farmland which dominates the development area is not optimal habitat. Losses of hedgerow, small areas of scrub (in the south of the Site) and gardens at Begbroke Science Park could reduce the availability of habitat and connectivity within the developable areas. Without access holes for hedgehogs, residential gardens are likely to offer limited habitat value for this species. However, the extensive creation of species rich and rough grassland, scrub woodland and wetland habitats proposed in the east and north of the Site are likely to increase the habitat resource for this species overall.	Minor beneficial – given the extent of habitat creation
	Reduced population through killing and injury of individuals.		There is some potential for individual hedgehogs to be killed or injured during both initial site clearance works (e.g., clearance of hedgerows or scrub (where hedgehogs should be sheltering) and during construction (e.g., entrapment in excavations).	
19. Brown Hare	Reduced population through loss	Site clearance, development and landscaping	Small numbers of this species are likely to be present at the Site. The arable land which dominates the areas proposed for built development offers suitable habitat (although this is	Minor adverse

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	of habitat and habitat connectivity		suboptimal due to intensive management, a lack of structural complexity, and narrow field margins). Development will make this area unsuitable for this species. However, the extensive habitat creation works in the east and north of the Site are likely to increase the habitat resources for this species at the Site overall, due to the creation of extensive meadow areas with no public access both within the Nature Conservation Area and south of Sandy Lane (the area of skylark habitat east of the rail line) which will be grassland suitable for brown hare. Other habitats, such as along the banks of the Rowel Brook, will offer some suitability (although less than the other areas, due to public access) and good habitat connectivity. Overall, there is not likely to be a reduction in habitat opportunities or connectivity for this species beyond the Site level, and there is potential for a benefit at the local level.	
	Reduced population of an SPI through killing and injury of individuals.	Site clearance and development / landscaping	Killing and injury of adult brown hare is not expected to occur during construction due the mobility of this species. Young are less mobile and there is some potential for their killing and injury during clearance and development. However, given the mitigation in the Outline CEMP, such impacts are considered to be negligible. The effect on brown hare is considered, on a precautionary basis, to be adverse at the Site level.	
20. Breeding birds	Change in value of the Site for	Site clearance	Of the skylark territories recorded at the Site in 2022, the area proposed for built development supports nine. These will be lost with the Proposed Development. There is potential for the loss of two territories in the area of	Minor adverse – due to the likely reduction

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	farmland birds		<p>proposed greenspace in the vicinity of Rowel Brook and four to be lost in the Canalside Park area. The proposed Nature Conservation Area in the north-east of the Site is likely to be enhanced for skylark, as is a new 11 ha area of meadow (specifically aimed at skylark conservation) adjacent to the Canalside Park. Based on the approach of Fox (2022)²² it is likely that this meadow could deliver around four territories. Overall, the Proposed Development could lead to the loss of around 10 skylark territories. Without appropriate mitigation, the reduction in breeding habitat for this SPI is considered to be an adverse impact at the local level.</p> <p>Other farmland birds recorded at the Site include yellowhammer (eight territories), linnet (1 territory) and grey partridge (1 territory). Given the proposed habitat creation at the Site which will include extensive areas of grassland with scrub, there is not likely to be a reduction in the numbers of the former two species. Since grey partridge is associated with large tracts of arable land, this species is likely to be lost from the Site.</p>	in local skylark populations
	Change in value of the Site for other breeding birds	Site clearance	The Site supports a range of other breeding birds which nest in trees and scrub (not open ground). The proposed habitat creation within greenspace areas, which includes the creation of woodland, scrub, rough and species-rich grassland, wetland scrapes, ponds and SuDS wetlands, will increase the value of the Site as a whole for this species.	
	Killing or injury of	Site clearance and tree felling	The potential for the killing and injury of individual birds and damage or destruction of their nests during vegetation	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	individual birds and damage or destruction of active nests.		<p>clearance (including of cropland) and felling of trees is considered unlikely, given the mitigation measures set out in the Outline CEMP.</p> <p>Disturbance of nesting red kite at Begbroke Science Park is possible without specific additional mitigation. No other Schedule 1 bird species have been recorded from the Site or are likely to be affected (e.g., barn owl and kingfisher are not likely to breed at the Site).</p>	
21. GCN	Reduction in population through loss of habitat and habitat connectivity	Clearance for development	<p>A small population of this species is known to breed at the pond at Begbroke Science Park. On a precautionary basis, this assessment assumes that the pond and associated terrestrial habitat suitable for great crested newt will be lost for the Proposed Development. Given the small size of the population, its apparent lack of connectivity, and the occurrence of this species across the wider area (as evidence by the desk study), this loss is considered, as a worst case, to be an adverse impact at the district level. Destruction of a population and of a habitat of this species would also be a breach of wildlife legislation. Beyond Begbroke Science Park, the area proposed for development is dominated by arable land which provides poor habitat for this species, although the hedgerow network could provide some habitat connectivity for it at the Site level. The habitat creation works proposed within greenspace in the north and east of the Site would provide extensive areas of terrestrial and breeding habitat for this species, but this would only be of use if there was a population in the vicinity (which, given the survey evidence, is unlikely) or if the population from the</p>	Moderate adverse

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			science park can be translocated to this area (see mitigation section below).	
22. Common toad	Change in population through loss and creation of habitat and habitat connectivity	Site clearance, construction and landscaping	<p data-bbox="976 520 1760 1398">The area proposed for built development is currently dominated by intensively managed arable land, of limited value to amphibians. The hedgerow network there provides some habitat and also contributes habitat connectivity. The pond and terrestrial habitats at Begbroke Science Park that provide habitat for this species are assumed to be lost for the Proposed Development. Under a worst-case assumption, with this pond being the primary or only breeding site within the Site, then there could be a loss of the current breeding habitat from the Site. However, the proposed greenspace shown on the Parameter Plans will provide extensive areas of new or enhanced habitat for amphibians such as common toad, in the form of woodland, scrub, grassland and SuDS wetland. Five of the six ponds on the Site will be retained through the Proposed Development and will be subject to conservation management and better connected by greenspace habitats, and six new wildlife ponds will be created at the Site. In total the breeding and terrestrial habitats at the Site for common toad will increase, and therefore there is good potential for the toad population at the Site to be maintained or increase following the Proposed Development.</p>	Minor adverse

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	Killing and injury of individuals.	Site clearance and construction / landscaping	Due to this species being concentrated at the Science Park (which could support the main population of this species at the Site), construction works there would require specific mitigation to avoid adverse effects at the Site level from killing and injury. Protection measures in the Outline CEMP are sufficient to avoid significant killing or injury of individual toads during construction across the remainder of the Site.	
23. Brown hairstreak butterfly	Reduced population size through habitat loss	Clearance for development	Surveys found this species to breed in hedgerows along Sandy Lane and in an area of scrub in the south of the Site. The former will be retained through the Proposed Development and will be brought into conservation management. The latter will likely be lost. This species could breed elsewhere on the Site, although the intensive management of the majority of hedgerows limits their value to this species. The proposed habitat creation within greenspaces is likely to benefit this species but without detailed plans showing the planting and appropriate management of blackthorn to allow breeding by this species, there is risk of reduction in the value of the site for this species.	Minor adverse
	Reduction in habitat connectivity	Intentional clearance for development	Given the extent of greenspace in the Proposed Development and the movement and dispersal abilities of this species, there is unlikely to be any reduction in habitat connectivity.	
	Killing of individuals	Site clearance and construction	The loss of eggs through site clearance and management of areas of hedgerow could have a temporary adverse impact at a local level but is considered unlikely to lead to a	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			permanent reduction in population size or to affect the conservation status of this species beyond the Site level.	
24. Reptiles	Reduced population size through habitat loss	Site clearance and construction	Currently, areas of the Site supporting reptiles are limited to the north-east corner, minimal habitat near Parker's Farm, and scrub at the south of the Site. There is also potential for small numbers elsewhere. Under the Proposed Development, the reptile habitat at Parkers Farm, and in the south of the Site will be lost. However, the extensive habitat creation and enhancement in greenspace for the Proposed Development (e.g., grasslands, scrub, ponds and SuDS wetland), and appropriate management (as outlined in the Outline LEMP) is likely to benefit populations of these species locally, leading to a population increase overall.	Minor adverse
	Habitat degradation	Physical damage during Site clearance and construction	Protection measures in the Outline CEMP are sufficient to avoid significant accidental habitat impacts during construction.	
	Reduced habitat connectivity	Site clearance and construction	Habitat connectivity at the Site and local level is likely to be increased by the Proposed Development, due to the extent and type of greenspace proposed, and its connectivity to adjacent habitats such as Rushy Meadows SSSI and the Oxford Canal.	
	Killing and injury of individuals	Site clearance and construction	The measures in the Outline CEMP are likely to be sufficient to avoid impacts to reptiles in the majority of the Site. However, without specific translocation measures to capture and move reptiles to suitable alternative habitats, clearance works at Parkers Farm and of the scrub at the south of the Site is likely to affect reptile populations at the site or local level. Without appropriate mitigation measures in place there	

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			<p>is potential for the killing or injury of reptiles which would be in breach of wildlife legislation.</p> <p>Killing or injury of reptiles could have a temporary adverse effect on the population of this species at the local level, but given the limited extent of good habitat to be cleared, and the extent of new terrestrial habitat to be provided, it is considered unlikely to lead to a permanent reduction in population size or to affect the conservation status of reptile species at the Site.</p>	
25. Net biodiversity value of the Site	Change in net biodiversity value of the site	Site clearance, construction and landscaping.	<p>The BNG assessment indicates that the Proposed Development will result in a net gain in biodiversity at the Site, well above planning policy requirements, and without the need of off-site compensation. This is driven by the large extent of greenspace and the high proportion of semi-natural habitats that this will comprise (as per the Parameter Plans and the Outline LEMP). The BNG assessment of the Illustrative Masterplan (see Appendix 13.3) indicates a BNG of above 20% (i.e., more than double the 10% requirement in the Environment Act).</p>	Moderate beneficial
		Sub-optimal habitat creation	<p>In the absence of a detailed habitat creation plans and methods, there is potential for the proposed habitats and habitat conditions at the site to be sub-optimal, reducing the biodiversity gain associated with the project. Given the extent of greenspace proposed, and the calculated biodiversity gain, such impacts could reduce the level of biodiversity gain, but are not considered likely to reduce the gain below 10%.</p>	

Additional Mitigation, Monitoring and Residual Effects

Mitigation

13.6.2 Table 13.13 sets out appropriate ecological mitigation measures that are additional to the embedded mitigation for the construction phase. These seek to mitigate the potential adverse effects identified above to acceptable levels, and in-line with CIEEM Guidance, provide ecological enhancements. As for the operational phase, some of these commitments will be provided through adherence to the Outline LEMP.

Table 13.13: Additional Mitigation Measures

Receptor	Additional Construction Phase Mitigation
2. Rushy Meadows SSSI	<ul style="list-style-type: none"> ▪ Detailed CEMP(s) to include specific SSSI protection measures in vicinity of SSSI, to prevent accidental incursion. ▪ Boundary hedgerow of Site in proximity to SSSI to be retained and managed for conservation. ▪ 15m buffer of uncultivated native vegetation (e.g., grassland and scrub) to be included on parts of the Site bordering the SSSI.
5. Lower Cherwell Valley CTA	<ul style="list-style-type: none"> ▪ Detailed CEMP(s) and LEMP(s) to include detailed measures to achieve and maintain CTA objectives
7. Grassland	<ul style="list-style-type: none"> ▪ Detailed habitat creation and management measures to be included in the detailed CEMP(s) and LEMP(s), based primarily on: (1) Retention of the grassland in the northern part of the Nature Conservation Area, scarification and overseeding of the sward with a floodplain meadow grassland seed mixture. (2) The northernmost field within the Nature Conservation Area will require minimal measures, due to remnant floodplain species in the sward, and reptiles being present. (3) Grassland creation of current arable areas using a suitable wildflower grassland seed mixture for loamy soils. ▪ Detailed CEMP(s) to include detailed habitat protection measures to avoid accidental damage during construction.
8. Woodland	<ul style="list-style-type: none"> ▪ Detailed CEMP to include habitat protection measures to avoid accidental damage during construction. ▪ Tree and scrub planting patterns should employ irregular rather than regular spacing to provide habitat variability.
9. Hedgerows and ditches	<ul style="list-style-type: none"> ▪ Any hedgerow losses are to be compensated within the Site through the planting of species-rich native hedgerows on a 3.5 for one basis (i.e., for every linear metre lost, 2 metres would be created). ▪ At least 3 km of species-rich native hedgerow with trees associated with a bank or ditch are to be created across the development.

Receptor	Additional Construction Phase Mitigation
	<ul style="list-style-type: none"> ▪ The BNG assessment based on the illustrative masterplan indicates that the above mitigation would yield a net gain for hedgerows at the Site of over 20%. ▪ New hedgerows are to include some hawthorn <i>Crataegus monogyna</i>, blackthorn <i>Prunus spinosa</i>, crab apple <i>Malus sylvestris</i>, hazel <i>Corylus avellana</i> and buckthorn <i>Rhamnus cathartica</i>, along with other appropriate shrubs and ground flora plants such as red campion <i>Silene dioica</i>, greater stitchwort <i>Stellaria holostea</i> and hedge bedstraw <i>Galium mollugo</i>. ▪ All retained and new hedgerows at the Site are to be provided with sufficient access (i.e., 4m wide adjacent buffers of native grassland) to allow access for management machinery. ▪ All retained, translocated and new hedgerows at the Site are to be subject to conservation management (e.g., trimming in winter every one year in three) to allow flowering and fruiting.
10. Rowel Brook and Oxford Canal	<ul style="list-style-type: none"> ▪ Detailed CEMP to include appropriate buffers to the Rowel Brook and Oxford Canal during construction. ▪ Ecological method statements required for any works with these buffers, such as new footpath bridge over the Rowel Brook. ▪ Detailed LEMP(s) to include measures to open the tree canopy in parts of the Rowel Brook to encourage marginal vegetation, through removal of non-native canopy trees such as sycamore.
12. Isolated trees	<ul style="list-style-type: none"> ▪ New tree planting should allow adequate spacing for trees, e.g., 5m minimum.
13. Arable plants	<ul style="list-style-type: none"> ▪ The detailed LEMP(s) should include measures to retain arable species at the Site. For example, through the planting and annual cultivation of an arable plants strip along part of the new LWS in the north of the Site, or within the Canalside Parkland in the east of the Site. Seeding with arable wildflowers is likely to be necessary. This should include corn marigold and common cudweed.
14. Badger	<ul style="list-style-type: none"> ▪ Mechanical digging is to be avoided within 30m of any active badger sett entrance. ▪ Hand digging (e.g., planting) works are likely to be possible up to 15m of active sett entrances, subject to a precautionary methods statement produced by a professional ecologist. No digging should take place within 15m of setts. ▪ Any badger sett requiring translocation (such as the large main sett towards the centre of the Site) is to be subject to licensed translocation. For main setts this will require the construction of an alternative sett within the central park area.

Receptor	Additional Construction Phase Mitigation
	<ul style="list-style-type: none"> ▪ Fencing at the Site should make provision for continued access to setts and greenspace by badgers, e.g., by including holes or gates suitable for this species. ▪ The detailed CEMP(s) should include protection measures for badger during construction, to prevent accidental entrapment in trenches, and other such impacts. This should include specific measures for works within 100m of the former landfill site on Sandy Lane, works within 100m of the access road between Begbroke Science Park and the A44, and works within the triangular field at the east of the Site (proposed for a children’s play area). Badger licenses are likely to be required from Natural England for works in these zones.
15. Bats	<ul style="list-style-type: none"> ▪ Any tree felling at the Site (such as at Begbroke Science Park) should be subject to checks for the potential for trees to support roosting bats, and (if necessary) follow up inspection or emergence surveys. ▪ Any trees supporting bats that require felling will require appropriate bat licences from Natural England (setting out appropriate mitigation). ▪ Any buildings to be demolished should be subject to update bat surveys in the season prior to demolition, to include external and internal checks for their potential to support roosting bats, and (if necessary) follow up inspection or emergence surveys. ▪ Any buildings supporting bats that require demolition roofing or any other works will require appropriate bat licences from Natural England (setting out appropriate mitigation). ▪ The detailed CEMP(s) should include measures to avoid light spillage, or disturbance by noise or vibration onto retained and adjacent vegetation during construction works. Retained trees, including along the southern boundary of the Site should not be subject to more an 0.5 lux additional lighting. ▪ The detailed CEMP(s) should include detailed measures to avoid accidental impacts to retained trees during construction.
16. Water vole and 17. Otter	<ul style="list-style-type: none"> ▪ Detailed LEMP(s) to include measures to open the tree canopy in parts of the Rowel Brook to encourage marginal vegetation, through removal of non-native canopy trees such as sycamore. ▪ Detailed CEMP(s) to include precautionary checks (by a professional ecologist) and precautionary protection measures for any works within 30m of the Rowel Brook or the Oxford Canal. ▪ If water vole burrows or otter holts are found in such proximity to works, or there is a risk of disturbance, appropriate licences from Natural England may be required for works to go ahead (setting out appropriate mitigation).

Receptor	Additional Construction Phase Mitigation
18. Hedgehog and 19. Brown Hare	<ul style="list-style-type: none"> ▪ Detailed CEMP(s) to include protection measures during clearance of vegetation, debris and other potential hedgehog habitat.
20. Breeding birds	<ul style="list-style-type: none"> ▪ Detailed CEMP(s) to include detailed measures for the protection breeding birds, including skylark, during clearance and construction, including clearance of crops and works starting or restarting on bare areas of land. ▪ Any tree felling at the Site (such as at Begbroke Science Park) should be carried out outside the bird breeding season wherever possible, or subject to checks by a professional ecologist. If active nests are present works will need to be delayed until no longer active, and suitable buffer zones should be employed to avoid disturbance. It is often not possible to thoroughly check tree canopies for nests, in which case works will need to wait until the end of the breeding season. ▪ Specific measures should be put in place at Begbroke Science Park during vegetation clearance, building demolition, construction and other works to avoid disturbance to breeding red kite. This is likely to include appropriate timing of works, monitoring of nesting, and (if and when necessary) exclusion zones for certain activities. ▪ Offsite skylark mitigation is to be created on arable land within 5km of the Site through arrangement with a landowner and/or tenant farmer. This is not necessarily to be delivered on Oxford University Land. Under the latter mitigation, skylark plots should comprise a minimum of two 4m x 4m plots per ha and should follow Natural England (2022a)²³ guidance. Based on Fox (2002)²², skylark plots at a minimum of 2 plots per ha on 83ha of arable land is considered sufficient to provide mitigation for the loss of 19 skylark territories. This mitigation will be subject to skylark surveys for each individual reserved matters application at the Site, and the appropriate extent of offsite mitigation then secured, e.g., through a planning condition or Section 106 agreement.
21. Great crested newt	<ul style="list-style-type: none"> ▪ The small population of this species in the ornamental pond at Begbroke Science Park should be translocated to a new pond within greenspace in the north east of the Site under a Natural England great crested newt licence. The new habitat for this species should include two ponds of at least a similar size to the current pond, and be surrounded by suitable terrestrial habitat, to include rough grassland and scrub, and a hibernation site. The translocation should take place once the new habitat is in a suitable state to support this species (e.g., two growing seasons following installation). Should this species naturally find its way to the new ponds prior to the translocation, this would not be a significant limitation, given the small size of the population to be translocated).

Receptor	Additional Construction Phase Mitigation
	<ul style="list-style-type: none"> A licensed destructive search should be carried out in terrestrial habitat at Begbroke Science Park (the adjacent arable land does not provide suitable habitat), and any great crested newts found (along with any other reptiles or amphibians) moved to the new habitat. Details of the mitigation strategy will be set out in the great crested newt licence application and the detailed CEMP(s).
F 22. Common toad and 24. Reptiles	<ul style="list-style-type: none"> The detailed CEMP(s) should set out measure for the precautionary destructive search for amphibians (and reptiles) in other suitable habitat across the Site, such as the triangle of scrub in the south, areas at Parker's Farm, and during clearance or translocation of hedgerows. At least ten hibernation sites suitable for reptiles and amphibians should be constructed across greenspaces at the Site. Details to be set out in the detailed CEMP(s).
23. Brown hairstreak butterfly	<ul style="list-style-type: none"> Blackthorn to be included in hedgerow and scrub planting mixes across the Site, at c. 5-15%.
25. Net biodiversity value of the Site	<ul style="list-style-type: none"> Detailed habitat creation (suitable for achieving a BNG) to be set out in the detailed LEMP(s).

Residual Effects

13.6.3 Table 13.14 sets out the residual effects following the implementation of the construction phase additional mitigation measures listed in Table 13.13, and identifies whether these are effects are significant.

13.6.4 Professional judgment by the author was used to determine the extent to which the additional mitigation above will reduce severity of the construction effects.

Table 13.14: Residual Effects during the Construction Phase

Receptor	Geographic Level	Severity Level	Significant
1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No
2. Rushy Meadows SSSI	Beneficial, local level	Minor beneficial	No
3. Other SSSIs	Neutral	Neutral	No
4. Ancient Woodlands	Neutral	Neutral	No
5. Lower Cherwell Valley CTA	Beneficial, local level	Moderate beneficial	Yes
6. Other non-statutory sites	Negligible adverse	Negligible adverse	No
7. Grassland	Beneficial effect, local level	Minor beneficial	No
8. Woodland	Beneficial effect, local level	Minor beneficial	No
9. Hedgerows and ditches	Beneficial, local	Minor beneficial	No

10. Rowel Brook and Oxford Canal	Beneficial effect, local level	Minor beneficial	No
11. Ponds	Beneficial effect, local level	Minor beneficial	No
12. Isolated trees	Adverse effect, Site level	Minor adverse	No
13. Arable plants	Adverse effect, Site level	Minor adverse	No
14. Badger	Neutral	Neutral	No
15. Bats	Beneficial effect, local level	Minor beneficial	No
16. Water vole	Beneficial effect, site level	Minor beneficial	No
17. Otter	Beneficial effect, site level	Minor beneficial	No
18. Hedgehog	Beneficial effect, Site level	Minor beneficial	No
19. Brown hare	Adverse effect, Site level	Minor adverse	No
20. Breeding birds	Beneficial effect, local level	Minor beneficial	No
21. Great crested newt	Beneficial effect, local level	Minor beneficial	No
22. Common toad	Beneficial effect, Site level	Minor beneficial	No
23. Brown hairstreak butterfly	Beneficial effect, Site level	Minor beneficial	No
24. Reptiles	Beneficial effect, Local level	Minor beneficial	No
25. Net biodiversity value of the Site	Beneficial effect, district level	Moderate beneficial	Yes

Assessment of Effects - Completed Development

13.6.1 Tables 13.15 assesses the potential effects of the operational phase of the Proposed Development on each of the 25 important ecological features, taking into account the embedded mitigation. Where habitat areas are mentioned, these have been taken from the baseline page of the biodiversity calculation for the Site (see Appendix 13.2). Further information on Oxford Meadows SAC, and potential impacts of the Proposed Development on this designated site are provided in the standalone Information to Inform HRA report.

Table 13.15: Operational Phase Effects

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
1. Oxford Meadows SAC	Habitat degradation	Aerial pollution from increased traffic on local roads	Air quality modelling (see Chapter 11: Air Quality of this ES) indicates that the Proposed Development will not have a significant adverse effect on the SAC due to changes in air quality when considered in isolation. For further detail, and consideration of cumulative effects with other plans and projects, see section 13.8.	Negligible adverse
		Water-born pollution from sewage discharges to local watercourses	The foul water from the Proposed Development will be treated at Cassington Sewage Treatment Works. Thames Water have confirmed that there is capacity. There is no nutrient neutrality requirement in place in relation to Oxford Meadows SAC. The Proposed Development will meet the mitigation requirements set out in Cherwell Local Plan Policies ESD8 and ESD9. Therefore, the Proposed Development will not have a significant adverse effect on the SAC due to changes due to water-borne pollution.	
		Increased recreational pressure	The Proposed Development is considered unlikely to have a significant adverse effect on the SAC due to increases in recreational pressure. This is considered further in the standalone Information to inform HRA report.	
2. Rushy Meadows SSSI	Habitat degradation	Increased recreational pressure	There are no current or proposed public rights of way or access within Rushy Meadows SSSI, which is a privately owned site. There are gaps in the boundary hedgerow on Begbroke Lane and along the Oxford Canal towpath which could enable trespass access to the SSSI. With the increase in residential buildings in proximity there is potential for increased levels of such trespass, and hence, increased level of recreational disturbance. However, given the extent of proposed greenspace in the Proposed Development, increased levels of visitors and hence of recreational pressure at the SSSI is likely to be negligible.	Negligible adverse

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
		Water-borne pollution from sewage discharges to local watercourses	<p>The SSSI is separated from the Site by Begbroke Lane, a bridleway and double hedgerows, c. 10m in width, and is upstream of the Site. About half of the boundary is also separated by a watercourse. The Desk Study Review and Ground Investigation report (Appendix 15.1) investigated hydrological connectivity between the Site and the SSSI and concluded that <i>“potential adverse impacts on the Rushy Meadows SSSI based on the proposed development are considered negligible”</i>.</p> <p>The FRA and Drainage Strategy (see Appendix 16.1) indicates that surface water flooding from the Proposed Development will not enter the SSSI, the SSSI being upstream of the Site. Therefore, there is no potential for waterborne pollution from the Site to reach the SSSI.</p>	
		Water-borne pollution from run-off from proposed community farm	There is very limited potential for pollution from the community farm, in comparison with the extensive area of intensive arable land which currently dominates the Site. The Proposed Development will result in reduction in this risk.	
		Aerial pollution from increased traffic on local roads	This SSSI is more than 200m from any major road. NE Guidance ¹⁵ indicates that impacts from aerial pollution at such distances can be ruled out. Sources within the Site within 200m of the SSSI are likely to be negligible.	
		Fly tipping	Due to the lack of vehicular access, boundary vegetation, and distance on foot (at least 210m between the SSSI and the nearest developable area of the Site), it is considered unlikely that any significant increase in fly tipping at the SSSI would result from the Proposed Development.	
3. Other SSSIs	Habitat degradation	Increased recreational pressure	For the SSSIs which form Oxford Meadows SAC (i.e., Pixey and Yarnton Meads, Wolvercote Meadows, Portmeadow with Wolvercote Common and Green Cassington Meadows) the assessment provided under Oxford Meadows SAC applies.	Negligible adverse

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			<p>Recreational pressure at Blenheim Park SSSI is managed by the landowner. Parking is controlled by the landowner, and access on foot from other parking areas is minimal. Natural England's condition assessment notes do not mention recreational pressure as a management issue or concern at any of these SSSIs. Given the extent of proposed greenspace in the Proposed Development, increased levels recreational pressure to this SSSI is likely to be negligible.</p> <p>There is no public access to Shipton on Cherwell and Whitehill Farm Quarries SSSI, Wytham Ditches and Flushes SSSI, Wytham Woods SSSI, or Woodeaton Quarry SSSI and no recreational impacts are anticipated. All other SSSIs are more than 4km from the Site and no recreational impacts are considered likely.</p>	
		<p>Aerial pollution from increased traffic on local roads</p>	<p>Traffic modelling indicates that there will be an increase in traffic above Natural England's 1000 AADT threshold within 200m of Wytham Woods SSSI, west of the A34 (see Chapter 11: Air Quality of this ES). Air quality assessment of the Proposed Development in combination with other proposed and planned development (see Chapter 11) indicates that it will not increase nitrogen oxide concentration and nitrogen deposition loads by more than 1% of relevant critical (i.e., impact screening) thresholds. Ammonia contributions will exceed 1% of critical thresholds and the absolute critical threshold be exceed on three transects (numbers 1, 2 and 3). The maximum percentage contribution will be 1.8% of the critical threshold, and the exceedance of 1% will extend less than 20, 30 and 40m into the SSSI on these transects, respectively. These transects are located in Marley Plantation, which is not Ancient Woodland but is broadleaved woodland that is regenerating from conifer plantation, following progressive felling. Given the limited extent of exceedance, and</p>	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			the habitat status in this location, air quality impacts of the Proposed Development at Wytham Woods SSSI are considered to be negligible.	
		Water-born pollution from sewage discharges to local watercourses	Thames Water have confirmed that their wastewater treatment facilities will be able to serve the Proposed Development. There is no nutrient neutrality requirement in place in relation to any of the SSSIs in the Zol. Impacts are therefore likely to be negligible.	
4. Ancient Woodlands	Habitat degradation	Increased recreational pressure	Of the three Ancient Woodlands within the Zol, two (Begbroke Wood and Worton Heath) have no public access. Public access at Bladon Wood is limited to a bridleway which passes through the woodland. Bladon Wood is 1.2km from the Site via a public footpath, crossing the A44 dual carriageway and passing through Begbroke. Given this limited access and the extent of proposed greenspace in the Proposed Development, increased recreational pressure at these woodlands is likely to be negligible.	Minor adverse
		Aerial pollution from increased traffic on local roads	Traffic modelling indicates that there will be an increase in traffic above Natural England's 1000 AADT threshold within 200m of four parcels of Ancient Woodland adjacent to the A34: Church Grove, Godstow Holt, and two unnamed parcels (see Chapter 11: Air Quality of this ES). Air quality assessment of the Proposed Development in combination with other proposed and planned development (see Chapter 11) indicates that it will not increase nitrogen oxide concentration by more than 1% of relevant critical (i.e., impact screening) thresholds. Nitrogen deposition loads will exceed the relevant critical at maximum between 10mm and 100m into these woodlands. The maximum in-combination contribution will be 2.7% of the critical threshold (at Godstow Holt). The maximum contribution at	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			10m into any woodland is 1.8%. Baseline levels are high, such that the greatest contribution to the total (on the boundary of Godstow Holt) is 0.9%). Ammonia contributions will exceed 1% of critical thresholds at all of the four woodlands, up to a maximum of 50m to 80m into the woodlands. Baseline levels are high, such that the greatest contribution to the total (on the boundary of Godstow Holt) is 0.93%). The maximum percentage contribution will be 2.9% of the critical threshold. Given the high pollution baseline, the limited additional contributions that the Proposed Development will make (even in combination with other plans and projects), this impact is considered, on precautionary basis, to be adverse at the district scale.	
5. Lower Cherwell Valley CTA	Habitat degradation	Increased air pollution	This CTA is more than 200m from any major road. Natural England guidance indicates that impacts from aerial pollution at such distances can be ruled out.	Moderate beneficial
		Increased recreational pressure	The part of the CTA west of the rail line is dominated by arable land which is not considered particularly sensitive to recreational pressure. Parts of these areas will have some public access as part of Rowel Brook Park under the Proposed Development. Areas of the CTA east of the rail line support grassland that will form part of a Nature Conservation Area with no public access. Given these considerations, and the low baseline value of the areas west of the rail line, adverse impacts are likely to be negligible.	
	Habitat improvements	Habitat management in line with the Outline LEMP	Habitat management (as outlined in the Outline LEMP) has the potential to improve and maintain the ecological value of habitats that the CTA well above the baseline level, such that a district-level beneficial effect is considered likely.	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
6. Other non-statutory sites	Habitat degradation	Increased recreational pressure	None of these sites are likely to be particularly sensitive to recreational pressure. Public access is limited or absent to all of the sites within a 2km return walk of the Site.	Negligible adverse
		Aerial pollution from increased traffic on local roads	Several wetland or wet grassland sites are within 20m of the A40. Given the habitats present, and the conclusions of detailed assessment of impact on SAC and SSSI habitat in this vicinity, there is not considered to be any potential for significant adverse effect from increased road traffic from the Proposed Development. The other sites are more than 200m from major roads.	
		Water-borne pollution from sewage discharges to local watercourses	Several of these sites (e.g., Stratfield Break, North Meadow West of Canal, and Meadows West of the Oxford Canal) are on or near the Oxford Canal, downstream of the Site. Pollution would need to happen during times of severe flood (such that the Oxford Canal was overtopping its banks at these Sites) in order for this pollution to be deposited at these sites, and such flood conditions would heavily dilute any pollution and would be likely to move it downstream from the sites. Overall, the adverse operational effects on these other non-statutory sites are likely to be negligible.	
7. Grassland	Habitat degradation	Increased recreational pressure	Grassland areas to be created or retained and enhanced within the proposed Nature Conservation Area would not be accessible to the public. All of the high value grassland in the Proposed Development would be in this area. Grassland to be created in the proposed Rowel Brook Park in the north of the Site and in the Canalside Parkland area in the east of the Site would be of moderate value (since it is on current arable land, and soil nutrient levels may limit the level of species richness that can be achieved there – see soil analysis results in Appendix 13.4). However, even these areas would likely have some area of grassland that	Minor beneficial

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			are inaccessible to the public (such as the skylark area, and area of long grass). Potential impacts from recreational pressure include trampling of vegetation, litter, fly-tipping and nutrient deposition from dog wate. These impacts are likely to be much lower in the areas without public access, resulting from trespass only.	
	Insufficient quality or quantity of retained and new grassland.	Grassland protection, enhancement and planting	Without a detailed specification of habitat protection, retention, enhancement and creation measures, there is some potential for damage to the current and future value of grassland at the Site and for an inadequate extent and/or quality of grassland retention and creation in the development. Given the information in the Green Infrastructure and Open Space Parameter Plan and the Outline LEMP, and the monitoring and remediation requirements in the latter, such problems are considered unlikely to reduce the overall effect on this habitat from being beneficial at the local level.	
	Habitat improvements	Habitat management in line with the Outline LEMP	Habitat management (as outlined in the Outline LEMP) has the potential to improve the ecological value of habitats that the CTA, such that a local beneficial effect is considered likely. Given the low current baseline value of these areas (apart from the northern part of the proposed Nature Conservation Area, which will not be publicly accessible), the habitat management that will result from the Proposed Development is likely outweigh the habitat degradation over the majority of these areas, resulting in an effect to grassland habitats that is beneficial at the local level.	
8. Woodland	Habitat degradation	Increased recreational pressure	Woodland to be created or retained and enhanced will be mainly in the new Local Nature Reserve. Therefore, there would be public access via footpaths and informal off-path access. Potential impacts from	Minor beneficial

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			<p>recreational pressure include trampling of vegetation, litter, fly-tipping and nutrient deposition from dog wate. These impacts are likely to be lower in the areas away from paths.</p> <p>The potential for impacts is limited by the condition of the woodland that is currently present on-site. This is only of moderate value, since it contains abundant non-native trees, a species-poor ground flora dominated by ivy, and few mature trees. It is not Ancient Woodland.</p>	
	Habitat improvements	Habitat management in line with the Outline LEMP	Habitat management (as outlined in the Outline LEMP) has the potential to improve the ecological value of existing and new woodland habitat at the Site, for example through shifting the canopy towards a higher proportion of native species, establishing a native understorey, and establishing a wider diversity of native ground flora. This would result in a beneficial effect on woodland at the Site.	
	Insufficient quality or quantity of retained and new woodland	Woodland protection, enhancement and planting	Given the information in the Outline LEMP, this risk is considered small.	
9. Hedgerows and ditches	Insufficient quality or quantity of new hedgerows	Protection, enhancement and planting	Given the information in the Outline LEMP on hedgerow creation and management, and the additional construction mitigation specified above for hedgerow creation (i.e., replacement of losses on a 3.5 to 1 basis, and the creation of least 3km of species-rich native hedgerow with trees associated with a bank or ditch across the Proposed Development, this is considered unlikely.	Minor beneficial
	Habitat degradation	Recreational pressure	There is potential for retained or new hedgerows to be damaged by littering, nutrient enrichment from dog wastes, and damage by persons creating informal routes (shortcuts) through them.	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
		Pollution from dumping	Given the proximity and likely public access, there is therefore some potential for non-native species (primarily plant species) to be introduced (such as by the intentional dumping of garden and aquarium wastes and by unassisted spread from gardens). Species such as Himalayan balsam for example, which are highly transferrable could spread across the Site and into the wider landscape more easily when ditches collect excess run off or via animal movements through / via ditches.	
		Dumping of invasive species	With increased residential and commercial development at the Site, in the absence of mitigation there is a possibility that pollutants could retained ditches which could adversely impact the biodiversity within these or watercourses downstream. However, such impacts considered unlikely because the retained ditches will be set within extensive greenspace, away from residential and commercial areas.	
		Benefits of retained and new hedgerow being put into conservation management.	Under the Outline LEMP, retained and new hedgerows will be put into conservation management, which is likely to raise and maintain their ecological value above the current baseline level of intensive management from many of the hedgerows.	
		Over or under management	The Outline LEMP goes some way to addressing management, but only if hedgerows remain out of private ownership. The magnitude of this impact should be considered in the context of the current standard intensive agricultural management of many of the hedgerows at the site (i.e., annual trimming), and also the fact that the majority of retained hedgerows are in locations outside private ownership, and so would be under the greenspace management regime.	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
10. Rowel Brook and Oxford Canal	Habitat degradation	Pollution by dumping or accidental spillage	The likelihood that pollutants are dumped or accidentally spilled into the Rowel Brook is considered low, given that the brook would be at least 100m from the nearest residential or commercial area, and there would be no vehicle access.	Minor adverse
		Pollution from surface water runoff	The extensive areas of greenspace that would surround the Rowel Brook under the Proposed Development and the cessation of large-scale commercial farming on the Site (along with the proposed soil erosion, and use of herbicide and pesticide), would provide site-level benefits to the brook. The potential for surface water drainage from the Proposed Development to release pollutants, such as oils and tyre dust, from roads into the brook is considered low, given the oil interceptors and SuDS settlement ponds proposed in the Drainage Strategy.	
		Scouring or rapid flow changes from surface water discharges	Based on the Drainage Strategy for the Proposed Development there will not be significant adverse changes to the flow regime in the Rowel Brook.	
		Increased recreation	There is a potential for increased recreational use of the Rowel Brook from the Proposed Development, for example children playing in the Brook and associated bank erosion, bed and sediment disturbance, damming, etc. This could have localised impacts on the invertebrate or fish community. Extensive areas are likely to be unaffected due to lack of access paths, steeper banks, deeper water or adjacent scrub or vegetation, etc. Therefore this impact is likely to be limited to site level or below.	
		Access by dogs	With the likely increase in dog walking, it is likely that the Rowel Brook will be at increased risk from access by dogs, which would cause an increase in damage to vegetation, bank side erosion and churning the water and	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			substrate up. There is also potential of pollution from flea treatments and other medications washing off, which can be toxic to freshwater invertebrates. This impact could be adverse at the site level.	
		Dumping of invasive / non-native species	Given the proximity and likely public access, there is some potential for non-native species (primarily plant species) to be introduced (such as by the intentional dumping of garden and aquarium wastes and by unassisted spread from gardens). The ecological effects of this could reduce the conservation value of the brook and adjacent habitats.	
		Over or under-management	With adherence to the principles set out in the Outline LEMP, the Proposed Development is likely to result in an improvement in brookside habitats compared to the current baseline.	
12. Ponds	Habitat degradation	Pollution from dumping or surface water	The likelihood that pollutants are dumped into ponds at the Site is considered low, given that the retained and new ponds will be in greenspace areas, likely away from residential and commercial areas. Since retained and new ponds will be set in extensive greenspace and there will be a surface water drainage system (including settlement ponds, SuDS etc.), pollution of existing and new ponds is considered unlikely.	Beneficial effect, Site level
		Recreational impacts	With the likely increase in dog walking, it is likely that the ponds will be at increased risk from access by dogs, which would cause an increase in damage to vegetation, bank side erosion and churning the water and substrate up. There is also potential from pollution from flea treatments and other medications washing off. This could lead to the overall condition of ponds decreasing as well as impacting water quality with nutrient load increasing within the water column.	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
		Access by dogs	With the likely increase in dog walking, it is possible that ponds at the site will be at increased risk from access by dogs, which would cause an increase in damage to vegetation, bank side erosion and churning the water and substrate up. There is also potential of pollution from flea treatments and other medications washing off, which can be toxic to freshwater invertebrates.	
		Dumping of invasive / non-native species	Given the proximity and likely public access, there is some potential for non-native species (primarily plant species) to be introduced (such as by the intentional dumping of garden and aquarium wastes and by unassisted spread from gardens). The ecological effects of this could reduce the conservation value of retained and new ponds.	
		Over or under-management	There is no evidence of current or recent management of the ponds on Site. The Outline LEMP indicates conservation enhancement of retained ponds and ongoing conservation management. There is potential for over or undermanagement, but the level of management is likely to be an improvement on baseline conditions. Therefore, the operational effect on ponds is likely to be beneficial at the Site level.	
13. Isolated trees	Degradation in habitat value	Increased levels of arboricultural management	Once embedded within residential and recreational areas, mature trees already present within the Site may be subject to increased arboricultural management due to the health and safety concerns of management authorities. This could reduce their ecological value, but could also provide ecological benefits, by extending tree lifespans.	Minor adverse
		Damage through recreational use	It is possible that mature trees could be utilised recreationally by children (e.g., tree climbing, swings from branches or damage to roots close to the surface through continued use). Such damage is likely to be limited. Overall, the operational effect on isolated trees is considered to be adverse at the site level.	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
13. Arable plants	Degradation in habitat value	Lack of on-going conservation management	If no conservation management regime is implemented for the success of notable arable plants, then species including corn marigold and common cudweed could be lost from the Site. These species require disturbed ground and are unlikely to be retained at the Site without specific management. Without additional mitigation, the overall operational effect on arable plants is considered to be adverse at the site level.	Minor adverse
14. Badger	Killing and injury of individuals	Increased numbers of collisions with road vehicles	New roads at the Proposed Development will mainly be local roads and are likely to have a 30 mph speed limit, limiting the potential for collisions with badgers. There would not be conservation impact, since badger is a common and widespread species across the UK, hence the impact is considered neutral in conservation terms.	Neutral
15. Bats	Reduced population through degradation of foraging, roosting or commuting habitat	Increased levels of light pollution due to external lighting	The Outline Lighting Statement presents a lighting strategy for the Proposed Development, which includes: maintaining baseline levels at Begbroke Hill Farmhouse (because it is a known bat roost), maintaining dark corridors between the farmhouse and the Rowel Brook in the north and Sandy Lane to the south (in order to provide habitat corridors for bats), minimising lighting in greenspace, limiting lux levels on internal roads, and employing colour temperatures below 300°K (because these generally have lower impacts on bats and invertebrates). These measures are likely to avoid significant adverse effects on bats, particularly given the extensive proposed habitat and roost creation. However, without a detailed lighting strategy, it is not possible to rule out localised areas where lighting levels will limit the presence of bats. Bat box siting will be important in maximising their value for a range of species although common and soprano pipistrelles (the dominant bat species at the Site) are known to be relatively tolerant of lighting.	Minor adverse

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
			<p>The extensive dark greenspaces that will provide an east-west corridor along Rowel Brook, and a north-south corridor adjacent to the Oxford Canal, and narrower dark corridors along Sandy Lane and north-south through Begbroke Science Park will retain habitat connectivity for bats at the local level and broadly within the Site itself.</p> <p>Adverse impact of lighting on trees within greenspace will be avoided by the strategy. Trees along the southern boundary, which include potential bat roosts, could be affected.</p>	
16. Water vole	Killing and injury of individuals	Predation by cats	Predation of water voles by cats is not considered to be an important factor in determining their conservation status, primarily due to their aquatic nature making them relatively inaccessible to cats (their major predator in the UK is American mink, which is an aquatic species).	Negligible adverse
	Disturbance	Recreational disturbance from people and dogs	There is potential for increased recreational activity within the Rowel Brook Park to reduce the future suitability of more accessible parts of the Rowel Brook for water vole. However, the scale of this impact is limited by the current absence of this species from the Site.	
17. Otter	Killing and injury of individuals.	Increased numbers of collisions with road vehicles	Given that proposed roads will be local and that otter has not been recorded on the Site, there is considered to be a negligible adverse effect on otters from collisions with cars.	Negligible adverse
18. Hedgehog	Reduced population of a SPI caused by killing and injury of individuals	Increased numbers of collisions with road vehicles	There is potential for increased road collisions with hedgehogs with new access roads and residential roads being developed across the Site. Given the susceptibility of this species to traffic impacts, this could affect local hedgehog populations.	Minor adverse

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
19. Brown Hare	Reduced population caused by killing and injury of individuals	Increased numbers of collisions with road vehicles.	New roads within the Proposed Development will mainly be local roads and are likely to have a 30 mph speed limit, limiting the potential for collisions with this species.	Minor adverse
	Reduced population caused by killing, injury or displacement of individuals	Increased recreational pressure on open habitats, especially from dog walkers.	Recreational disturbance will limit the value to brown hare of the parts of the greenspace that are accessible to the public. However, an area at the east is proposed to be made inaccessible, as are the Nature Conservation area and skylark mitigation area east of the rail line. Various other (publicly accessible) areas of greenspace will still provide a level of suitability, and importantly, habitat connectivity across greenspace at the Site and between the above areas, and the SSSI to the north. The rail line will also provide habitat connectivity for this species within any beyond the Site boundary.	
20. Breeding birds	Reduced population caused by killing and injury of individuals	Increased predation pressure from increased populations of domestic cats	Where proposed residential areas will be in proximity to greenspace, there is likely to be an increased predation rate on wild birds by domestic cats. Considered in isolation, this effect could possibly reduce populations of generalist bird species at the Site, which will be nesting/foraging in proximity to developed areas (particularly songbirds and including SPIs such as dunnock). However, most areas of greenspace in the Proposed Development are well separated from proposed residential areas.	Minor adverse
	Reduced population caused by killing, injury or	Increased recreational pressure on suitable open habitats,	Recreational disturbance is not considered likely to affect tree and scrub nesting bird species. Public access to the Rowel Brook Park is likely to limit its value for ground-nesting bird species, although there will be other areas of habitat creation at the Site (such as the Nature Conservation Area, and the skylark mitigation area where there is no public access).	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	displacement of individuals	especially from dog walkers		
21 Great crested newt	Reduced population through degradation of breeding habitat.	Pollution incident within development, carried to ponds via surface water	Given the assessment under <i>Ponds</i> above, impacts on great crested newts in or near ponds from pollution is considered unlikely.	Minor adverse
		Reduced habitat degradation due to natural infilling by vegetation	Retained and new ponds at the Site will be subject to ongoing conservation management as per the Outline LEMP. This will maintain open water and limit encroachment by vegetation (the natural process by which ponds become infilled by vegetation over time). This will be a beneficial effect.	
	Reduced population caused by killing and injury of individuals	Increased mortality through collisions with road vehicles	Given the low population and likely translocation of individuals away from developable areas, deaths of great crested newts caused by road vehicles are considered to be rare enough not to have an effect on the size of the local population of this species.	
		Entrapment in the surface water drainage system (especially gully pots)	Entrapment within the surface water drainage system, due to great crested newts entering (and being unable to escape from) gully pots and drains could potentially have an effect on the size of the local population of this species. This would only have potential to affect the population of this species if the location of the receptor pond(s) for the translocated population was in the vicinity of a main road.	
22. Common Toad	Reduced population caused by killing and	Increased predation pressure from increased	Where new and retained habitat suitable for common toad is present in proximity to proposed residential areas, there is likely to be an increased predation rate by domestic cats, potentially leading to a reduction in the population of common toad in certain areas of the Site. Given the wider	Minor adverse

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	injury of individuals	populations of domestic cats.	dispersal of this species away from breeding ponds, and the fact that retained and new ponds will be in greenspace, not close to proposed residential areas, this effect is likely to be limited, likely adverse at the site level.	
23. Brown hairstreak butterfly	Degradation of habitat value for invertebrates	Reduced habitat degradation through intensive hedgerow management	The Outline LEMP specifies that retained and new hedgerows will be under conservation management, in place of the current regime which is intensive annual trimming of many hedgerows at the Site. Given the new hedgerow planting and scrub planting in the Outline LEMP and specified under additional construction mitigation above, this conservation management is likely to increase and maintain the value of the Site for this species above the baseline level.	Minor beneficial
		Over management of retained and new hedgerows and scrub	Brown hair streak butterflies lay eggs August–October, which then hatch in April–May. In the absence of appropriate management of hedgerows, specifically areas of blackthorn, large numbers of viable eggs maybe lost, adversely impacting the local population. However, given the conservation management specified in the Outline CEMP, this is considered unlikely.	
24. Reptiles	Reduced population caused by killing and injury of individuals	Increased predation pressure from increased populations of domestic cats	Where new and retained habitat suitable for reptiles is present in proximity to proposed residential areas, there is likely to be an increased predation rate by domestic cats, potentially leading to a reduction in the population of reptiles in certain areas of the Site. The majority of new greenspace is well separated from proposed residential areas, this effect will be limited.	Minor beneficial
	Reduced population of caused by	Increased recreational pressure on	Given the extensive creation of new grassland, scrub and woodland habitats within the development, this effect is not considered to have a significant effect on local reptile populations. The retained reptile population in the north-east of the Site will not be publicly accessible.	

Receptor	Potential Effect	Relevant Development Activity	Detail of Ecological Effect	Significance of Effect
	displacement of individuals	suitable open habitats		
	Increased habitat suitability	Conservation management of habitats to retain suitability for reptiles	The on-going habitat management at the site set out in the Outline LEMP is likely to raise and maintain the value of the site for reptiles above the baseline level.	
	Reduced population of SPIs caused by displacement of individuals	Over or under-management of grassland	Should over management of grassland habitats occur then it would become unsuitable for reptiles due to a lack of habitat structure and cover. Alternatively, should scrub be allowed to overrun greenspaces, this would limit suitable habitat and could reduce reptile populations at the Site.	
25. Net biodiversity value of the Site	Change in biodiversity value of the Proposed Development (compared with the predicted value)	Sub-optimal on-going management	In the absence of a management plan there would be potential for the proposed habitats and habitat conditions within the Proposed Development to be sub-optimal, reducing the biodiversity gain. However, given the extent of greenspace proposed, the calculated biodiversity gain, and the principles of the Outline LEMP, this is not considered likely to reduce the biodiversity gain below a level that this beneficial at the district level.	Moderate beneficial

Mitigation, Monitoring and Residual Effects

Mitigation

13.6.2 Tables 13.16 sets out appropriate ecological mitigation measures that are additional to the embedded mitigation for the operational phase. These aim to mitigate the potential adverse effects identified in Table 13.15, including ecological enhancements where appropriate.

Table 13.16: Additional mitigation measures

Receptor	Additional Operational Phase Mitigation
5. Lower Cherwell Valley CTA	<ul style="list-style-type: none"> Detailed LEMP(s) to include detailed measures to achieve and maintain CTA objectives.
7. Grassland	<ul style="list-style-type: none"> Footpath design within current and new woodland to maintain some areas without access.
8. Woodland	<ul style="list-style-type: none"> Footpath design to maintain the majority of the length of the Rowel Brook and its tributary without public access.
9. Hedgerows and ditches	<ul style="list-style-type: none"> Retained hedgerows and new native hedgerows to be in ownership and layouts that will enable access for management (e.g., 4m wide natural grassland buffer strip each side, to allow tractor and flail access). Trimming to take place in winter, a maximum of one year in three for any given hedgerow section.
10. Rowel Brook and Oxford Canal	<ul style="list-style-type: none"> Footpath design to maintain a buffer of at least 2m of native vegetation the majority of the length of the Rowel Brook and its tributary, with fencing as appropriate to minimise access by people and dogs. Detailed LEMP(s) to include ongoing measures to open the tree canopy in parts of the Rowel Brook to encourage marginal vegetation, through removal of non-native canopy trees such as sycamore.
13. Arable plants	<ul style="list-style-type: none"> Annual cultivation of the arable plants strip (see Outline LEMP) will be necessary to allow these species to persist.
15. Bats	<ul style="list-style-type: none"> A detailed lighting plan for the development and or individual phases of the development (including lux level contour plans) should be produced, within input from a professional ecologist, and subject to a planning condition requiring approval by the Council's Ecology Officer. This plan should indicate dark corridors along Sandy Lane, Begbroke Lane, Kidlington Lane, through the green connection between Sandy Lane, Begbroke Science Park and the Rowel Brook, and across greenspace at the Site. The lighting plan will be in accordance with industry standard guidance on lighting and bats (e.g. ILP/BCT, 2018, or as updated).
16. Water vole	<ul style="list-style-type: none"> Footpath design to maintain the majority of the length of the Rowel Brook and its tributary without public access.

Receptor	Additional Operational Phase Mitigation
	<ul style="list-style-type: none"> ▪ Detailed LEMP(s) to include measures to open the tree canopy in parts of the Rowel Brook to encourage marginal vegetation, through removal of non-native canopy trees such as sycamore.
17. Otter	<ul style="list-style-type: none"> ▪ Footpath design to maintain the majority of the length of the Rowel Brook and its tributary without public access.
18. Hedgehog	<ul style="list-style-type: none"> ▪ New fences at the Site to include access to allow hedgehogs to move between greenspaces and between gardens (including individual residential gardens) within the Proposed Development, such as suitable holes within fence bases.
19. Brown hare	<ul style="list-style-type: none"> ▪ New fences within or bordering greenspace at the Site (excluding residential and commercial areas, and greenspace surrounded by these) to include access to allow brown hare to move between greenspaces within and beyond the development such as suitable holes within fence bases, or 30cm gaps under fences.
21. Great crested newt	<ul style="list-style-type: none"> ▪ The surface water drainage system is to be designed to be amphibian friendly through input from a professional ecologist. This will be designed to minimise the likelihood of amphibians becoming trapped, such as through the installation of British Herpetological Society Amphibian Gully Pot Ladders (or equivalent) into all gully pots in the development. ▪ Kerbs on all road crossings or adjacent to greenspace are to be bullnose or half battered kerbs (rather than straight kerbs) in order to reduce the likelihood of amphibians being trapped on roads.
23. Brown hairstreak butterfly	<ul style="list-style-type: none"> ▪ Hedgerows and scrub at the site to be subject to conservation management, set out in detail in the detailed LEMP(s). These habitats not to be trimmed more than one year in three, to minimise destruction of overwintering eggs.
25. Net biodiversity value of the Site	<ul style="list-style-type: none"> ▪ Detailed habitat management (suitable for achieving a biodiversity net gain) to be set out in the detailed LEMP(s).

Monitoring

13.6.3 The Outline LEMP specifies various ecological monitoring, including monitoring of the invasive species American mink, of invasive plant species, and updating of the LMEP document every five years.

13.6.4 A schedule of monitoring of newt and enhanced habitats should be incorporated into the detailed LEMP, based on Natural England condition assessment guidance associated with the Biodiversity Metric 4.0.

Residual Effects

13.6.5 Table 13.17 sets out the residual effects following the implementation of the additional operational phase mitigation measures listed in Table 13.16, and identifies whether these are effects are significant.

Table 13.17: Residual Effects of the Operational Phase

Receptor	Geographic Level	Severity Level	Significant
1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No
2. Rushy Meadows SSSI	Negligible adverse	Negligible adverse	No
3. Other SSSIs	Negligible adverse	Negligible adverse	No
4. Ancient Woodlands	Adverse effect, local level	Minor adverse	No
5. Lower Cherwell valley CTA	Beneficial effect, district level	Moderate beneficial	Yes
6. Other non-statutory sites	Negligible adverse	Negligible adverse	No
7. Grassland	Beneficial effect, local level	Minor beneficial	No
8. Woodland	Beneficial effect, local level	Minor beneficial	No
9. Hedgerows and ditches	Beneficial effect, site level	Minor beneficial	No
10. Rowel Brook and Oxford Canal	Adverse effect, site level	Minor adverse	No
11. Ponds	Beneficial effect, site level	Minor beneficial	No
12. Isolated trees	Adverse effect, site level	Minor adverse	No
13. Arable plants	Adverse effect, site level	Minor adverse	No
14. Badger	Neutral	Neutral	No
15. Bats	Adverse effect, site level	Minor adverse	No
16. Water vole	Negligible adverse	Negligible adverse	No
17. Otter	Negligible adverse	Negligible adverse	No
18. Hedgehog	Adverse effect, site level	Minor adverse	No
19. Brown hare	Adverse effect, site level	Minor adverse	No
20. Breeding birds	Adverse effect, site level	Minor adverse	No
21. Great crested newt	Adverse effect, site level	Minor adverse	No
22. Common toad	Adverse effect, site level	Minor adverse	No
23. Brown hairstreak butterfly	Beneficial effect, site level	Minor beneficial	No
24. Reptiles	Beneficial effect, site level	Minor beneficial	No
25. Net biodiversity value of the Site	Beneficial effect, district level	Moderate beneficial	Yes

13.7 Combined Assessment of Effects

13.7.1 The residual effects of the construction phase and the operational phase of the Proposed Development considered together are shown in Table 13.18. Each of the effects (both constructional and operational) have been considered in turn and professional judgement has been applied to determine the overall effect. The combination of construction and operation impacts is rarely simply additive.

Table 13.18: Residual Effects of the Construction and Operation Phase Combined

Receptor	Geographic Level	Severity Level	Significant
1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No
2. Rushy Meadows SSSI	Beneficial effect, local level	Minor beneficial	No
3. Other SSSIs	Negligible adverse	Negligible adverse	No
4. Ancient Woodlands	Adverse effect, local level	Minor adverse	No
5. Lower Cherwell valley CTA	Beneficial effect, district level	Moderate beneficial	Yes
6. Other non-statutory sites	Negligible adverse	Negligible adverse	No
7. Grassland	Beneficial effect, local level	Minor beneficial	No
8. Woodland	Beneficial effect, site level	Minor beneficial	No
9. Hedgerows and ditches	Beneficial effect, local level	Minor beneficial	No
10. Rowel Brook and Oxford Canal	Beneficial effect, site level	Minor beneficial	No
11. Ponds	Beneficial effect, site level	Minor beneficial	No
12. Isolated trees	Adverse effect, site level	Minor adverse	No
13. Arable plants	Beneficial effect, site level	Minor adverse	No
14. Badger	Neutral	Neutral	No
15. Bats	Beneficial effect, local level	Minor beneficial	No
16. Water vole	Beneficial effect, site level	Minor beneficial	No
17. Otter	Beneficial effect, site level	Minor beneficial	No
18. Hedgehog	Beneficial effect, site level	Minor beneficial	No
19. Brown hare	Adverse effect, local level	Minor adverse	No
20. Breeding birds	Beneficial effect, local level	Minor beneficial	No
21. Great crested newt	Beneficial effect, local level	Minor beneficial	No
22. Common toad	Beneficial effect, site level	Minor beneficial	No
23. Brown hairstreak butterfly	Beneficial effect, site level	Minor beneficial	No
24. Reptiles	Beneficial effect, local level	Minor beneficial	No
25. Net biodiversity value of the Site	Beneficial effect, district level	Moderate beneficial	Yes

Significant Effects

- 13.7.2 Two of the combined residual effects are considered to be significant. A beneficial effect at the district level (i.e., a moderate beneficial effect) has been identified on Cherwell Valley CTA, due to the extent of habitat creation across all of this area, which will be in line with the CTA objectives and well connected to other habitats. A beneficial effect on the net biodiversity value of the Site has also been identified, because the BNG assessment indicates a biodiversity net gain of over 20%; this is considered to contribute to the habitat network at the district level and to therefore be a moderate beneficial effect.

Non-significant Effects

- 13.7.3 Adverse effects that are considered to be negligible have been identified on: SSSIs other than Rushy Meadows, and on non-statutory sites other than the CTA within the ZoI (all due to very small potential increases in visitor pressure at some of these sites).
- 13.7.4 Minor adverse effect have been identified on arable plants (due to potential losses at the Site level, on isolated trees (due to the potential for some losses), ancient woodland (due to air pollution from traffic on the A34), and on brown hare (due to a reduction in the suitability of the Site for this species). Overall beneficial effects at the Site level (i.e., minor beneficial effects) have been identified on woodland the Rowel Brook, hedgerows and ditches, and ponds (due to habitat creation and management), and on otter, water vole, hedgehog, breeding birds, common toad, brown hairstreak (because of the extent of habitat creation and management, which is likely to increase the extent and these habitats and the populations of these species at the Site).
- 13.7.5 Overall beneficial effects at the local level (i.e., minor beneficial effects) have been identified on Rushy Meadows SSSI (due to the extent of connecting habitat that will be created in proximity), grassland (because the Proposed Development will result in the creation of ecologically connected grassland resources considerably greater in extent and quality than the baseline resource), bats (due to the Proposed Development providing extensive new habitat, connectivity and roosting sites), and great crested newt and reptiles (due to the Proposed Development providing extensive new habitat and connectivity for these species, likely to increase the viability of their local populations)

13.8 Cumulative Effects

- 13.8.1 Appendix 3.4 lists cumulative schemes that have been considered for potential cumulative effects with the Proposed Development.
- 13.8.2 Cumulative scheme ref: 21/03522/OUT would provide green corridors and grassland habitats on land ca. 80m to the west of the Site, but the ecological linkage is limited by the presence of the A44 Woodstock Road between the two sites.

- 13.8.3 Cumulative effects of committed developments and the ‘PR sites’ⁱ on Oxford Meadows SAC are considered in Appendix 13.3 and illustrates that there would be no likely significant effects on this designated site from the Proposed Development. Cumulative effects of changes in air quality on SSSIs and on Ancient Woodland sites have been considered in the previous assessment tables, and are considered to have negligible adverse effects and minor adverse effects respectively, from recreational pressure and/or air quality changes.
- 13.8.4 Cumulative effects of increased pollution from traffic on Ancient Woodlands adjacent to the A34 have been included in the previous assessment tables and result in a minor adverse effect.
- 13.8.5 There is not considered to be potential for any other significant cumulative ecological effects of the Proposed Development, either during the construction or operation.

ⁱ As per the scenario completed for the traffic modelling, i.e. “*other plans or projects*”. See Chapter 9: Transport and Access and associated appendices for full details.

Table 13.20: Summary of Effects

Receptor (Sensitivity)	Geographic scale	Significance of Effect	Additional Mitigation and Monitoring	Significance of Residual Effect
Construction				
1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No	Negligible adverse
2. Rushy Meadows SSSI	Adverse, local level	Minor adverse	Yes	Minor beneficial
3. Other SSSIs	Neutral, local level	Neutral	No	Neutral
4. Ancient Woodlands	Neutral, local level	Neutral	No	Neutral
5. Lower Cherwell valley CTA	Beneficial, district level	Moderate beneficial	Yes	Moderate beneficial
6. Other non-statutory sites	Adverse, local level	Negligible adverse	No	Negligible adverse
7. Grassland	Beneficial, local level	Minor beneficial	Yes	Minor beneficial
8. Woodland	Beneficial, local level	Minor beneficial	Yes	Minor beneficial
9. Hedgerows and ditches	Adverse, district level	Moderate adverse	Yes	Minor beneficial
10. Rowel Brook and Oxford Canal	Beneficial, local level	Minor beneficial	Yes	Minor beneficial
11. Ponds	Beneficial, local level	Minor beneficial	Yes	Minor beneficial
12. Isolated trees	Adverse, local level	Minor adverse	Yes	Minor adverse
13. Arable plants	Adverse, local level	Minor adverse	Yes	Minor adverse
14. Badger	Neutral	Neutral	Yes	Neutral
15. Bats	Beneficial, local level	Minor beneficial	Yes	Minor beneficial
16. Water vole	Beneficial, site level	Minor beneficial	Yes	Minor beneficial
17. Otter	Beneficial, site level	Minor beneficial	Yes	Minor beneficial
18. Hedgehog	Beneficial, site level	Minor beneficial	Yes	Minor beneficial

Receptor (Sensitivity)	Geographic scale	Significance of Effect	Additional Mitigation and Monitoring	Significance of Residual Effect
19. Brown hare	Adverse, site level	Minor adverse	Yes	Minor adverse
20. Breeding birds	Adverse, local level	Minor adverse	Yes	Minor beneficial
21. Great crested newt	Adverse, district level	Moderate adverse	Yes	Minor beneficial
22. Common toad	Adverse, site level	Minor adverse	Yes	Minor beneficial
23. Brown hairstreak butterfly	Adverse, site level	Minor adverse	Yes	Minor beneficial
23. Reptiles	Adverse, local level	Minor adverse	Yes	Minor beneficial
24. Net biodiversity value of the Site	Beneficial, district level	Moderate beneficial	Yes	Moderate beneficial

Completed Development

1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No	Negligible adverse
2. Rushy Meadows SSSI	Adverse, local level	Negligible adverse	No	Negligible adverse
3. Other SSSIs	Adverse, local level	Negligible adverse	No	Negligible adverse
4. Ancient Woodlands	Adverse, local level	Minor adverse	No	Minor adverse
5. Lower Cherwell valley CTA	Beneficial, district level	Moderate beneficial	Yes	Moderate beneficial
6. Other non-statutory sites	Negligible adverse	Negligible adverse	No	Minor beneficial
7. Grassland	Beneficial, local level	Minor beneficial	Yes	Minor beneficial
8. Woodland	Beneficial, site level	Minor beneficial	Yes	Minor beneficial
9. Hedgerows and ditches	Beneficial, site level	Minor beneficial	Yes	Minor beneficial
10. Rowel Brook and Oxford Canal	Adverse, site level	Minor adverse	Yes	Minor adverse
11. Ponds	Beneficial, site level	Minor beneficial	No	Minor beneficial

Receptor (Sensitivity)	Geographic scale	Significance of Effect	Additional Mitigation and Monitoring	Significance of Residual Effect
12. Isolated trees	Adverse, site level	Minor adverse	No	Minor adverse
13. Arable plants	Adverse, site level	Minor adverse	Yes	Minor adverse
14. Badger	Neutral	Neutral	No	Neutral
15. Bats	Adverse, site level	Minor adverse	Yes	Minor adverse
16. Water vole	Adverse, site level	Negligible adverse	Yes	Negligible adverse
17. Otter	Adverse, site level	Negligible adverse	Yes	Negligible adverse
18. Hedgehog	Adverse, site level	Minor adverse	Yes	Minor adverse
19. Brown hare	Adverse, site level	Minor adverse	Yes	Minor adverse
20. Breeding birds	Adverse, site level	Minor adverse	No	Minor adverse
21. Great crested newt	Adverse, site level	Minor adverse	Yes	Minor adverse
22. Common toad	Adverse, site level	Minor adverse	No	Minor adverse
23. Brown hairstreak butterfly	Beneficial, site level	Minor beneficial	Yes	Minor beneficial
23. Reptiles	Beneficial, site level	Minor beneficial	Yes	Minor beneficial
24. Net biodiversity value of the Site	Beneficial, district level	Moderate beneficial	Yes	Moderate beneficial
Combined (Construction and Completed Development)				
1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No	Not significant
2. Rushy Meadows SSSI	Beneficial, local level	Minor beneficial	Yes	Not significant
3. Other SSSIs	Negligible, local level	Negligible adverse	No	Not significant
4. Ancient Woodlands	Adverse, local level	Minor adverse	No	Not significant
5. Lower Cherwell valley CTA	Beneficial, district level	Moderate beneficial	Yes	Significant

Receptor (Sensitivity)	Geographic scale	Significance of Effect	Additional Mitigation and Monitoring	Significance of Residual Effect
6. Other non-statutory sites	Negligible, local level	Negligible adverse	No	Not significant
7. Grassland	Beneficial, local level	Minor beneficial	Yes	Not significant
8. Woodland	Beneficial, site level	Minor beneficial	Yes	Not significant
9. Hedgerows and ditches	Beneficial, local level	Minor beneficial	Yes	Not significant
10. Rowel Brook and Oxford Canal	Beneficial, site level	Minor beneficial	Yes	Not significant
11. Ponds	Beneficial, site level	Minor beneficial	Yes	Not significant
12. Isolated trees	Adverse, site level	Minor adverse	Yes	Not significant
13. Arable plants	Adverse, site level	Minor adverse	Yes	Not significant
14. Badger	Neutral	Neutral	Yes	Not significant
15. Bats	Beneficial, local level	Minor beneficial	Yes	Not significant
16. Water vole	Beneficial, site level	Minor beneficial	Yes	Not significant
17. Otter	Beneficial, site level	Minor beneficial	Yes	Not significant
18. Hedgehog	Beneficial, site level	Minor beneficial	Yes	Not significant
19. Brown hare	Adverse, local level	Minor adverse	Yes	Not significant
20. Breeding birds	Beneficial, local level	Minor beneficial	Yes	Not significant
21. Great crested newt	Beneficial, local level	Minor beneficial	Yes	Not significant
22. Common toad	Beneficial, site level	Minor beneficial	Yes	Not significant
23. Brown hairstreak butterfly	Beneficial, site level	Minor beneficial	Yes	Not significant
24. Net biodiversity value of the Site	Beneficial, district level	Moderate beneficial	Yes	Significant

Receptor (Sensitivity)	Geographic scale	Significance of Effect	Additional Mitigation and Monitoring	Significance of Residual Effect
Cumulative Assessment				
1. Oxford Meadows SAC	Negligible adverse	Negligible adverse	No	Not significant
2. Rushy Meadows SSSI	No cumulative effects	No cumulative effects	No	Not significant
3. Other SSSIs	Adverse, local level	Negligible adverse	No	Not significant
4. Ancient Woodlands	Adverse, local level	Minor adverse	No	Not significant
5. Lower Cherwell valley CTA	No cumulative effects	No cumulative effects	No	Not significant
6. Other non-statutory sites	No cumulative effects	No cumulative effects	No	Not significant
7. Grassland	No cumulative effects	No cumulative effects	No	Not significant
8. Woodland	No cumulative effects	No cumulative effects	No	Not significant
9. Hedgerows and ditches	No cumulative effects	No cumulative effects	No	Not significant
10. Rowel Brook and Oxford Canal	No cumulative effects	No cumulative effects	No	Not significant
11. Ponds	No cumulative effects	No cumulative effects	No	Not significant
12. Isolated trees	No cumulative effects	No cumulative effects	No	Not significant
13. Arable plants	No cumulative effects	No cumulative effects	No	Not significant
14. Badger	No cumulative effects	No cumulative effects	No	Not significant
15. Bats	No cumulative effects	No cumulative effects	No	Not significant
16. Water vole	No cumulative effects	No cumulative effects	No	Not significant
17. Otter	No cumulative effects	No cumulative effects	No	Not significant
18. Hedgehog	No cumulative effects	No cumulative effects	No	Not significant
19. Brown hare	No cumulative effects	No cumulative effects	No	Not significant

Receptor (Sensitivity)	Geographic scale	Significance of Effect	Additional Mitigation and Monitoring	Significance of Residual Effect
20. Breeding birds	No cumulative effects	No cumulative effects	No	Not significant
21. Great crested newt	No cumulative effects	No cumulative effects	No	Not significant
22. Common toad	No cumulative effects	No cumulative effects	No	Not significant
23. Brown hairstreak butterfly	No cumulative effects	No cumulative effects	No	Not significant
24. Net biodiversity value of the Site	No cumulative effects	No cumulative effects	No	Not significant

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