

10 Biodiversity

10.1 Introduction

10.1.1 This chapter of the ES was prepared by Tyler Grange Group Ltd and presents an assessment of the likely significant effects of the Development on Biodiversity. 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.

10.1.2 The chapter is supported by the following appendices:

- Appendix 10.1: Legislation and Planning Policy;
- Appendix 10.2: Biodiversity Net Gain Calculation;
- Appendix 10.3: Phase 1 Habitat Survey & Great Crested Newt (GCN) eDNA Survey; and
- Appendix 10.4: Phase 2 Bat Survey Report (2017).

Competence

10.1.3 Aaron Grainger BSc MSc MCIEEM is the principal author of the biodiversity chapter of this ES. He is a Full Member of the Chartered Institute of Ecology and Environmental Management ('CIEEM') and has over 14 years' experience in the environmental sector and has produced numerous ES chapters for a wide range of projects. His experience includes large-scale residential schemes, as well as, managing the ecological and biodiversity input into the ES chapters for several nationally significant infrastructure projects.

10.2 Legislation, Planning Policy and Guidance

Legislation Context

10.2.1 The following legislation is relevant to the Development: (with more detail contained in Appendix 10.1):

- The Wildlife and Countryside Act 1981 (as amended)¹;
- The Conservation of Habitats Species Regulation 2017 (the 'Habitats Regulations')²;
- The Countryside and Rights of Way Act 2000³;
- The Protection of Badgers Act 1992⁴;
- The Hedgerows Regulations 1997⁵;
- The Natural Environment and Rural Communities (NERC) Act 2006⁶; and
- The Wild Mammals (Protection) Act 1996⁷.

10.2.2 Where relevant, the assessment takes account of this legislative protection.

Planning Policy Context

National

10.2.3 The following national planning policy is relevant to the Development:

- National Planning Policy Framework (NPPF) (Updated 2021)⁸.

Local

10.2.4 The following local planning policy is relevant to the Development:

- Cherwell Local Plan 2011 - 2031 Part 1 Partial Review, Adopted September 2020⁹;
- Cherwell Local Plan 2011 - 2031 Part 1, Re-adopted December 2016)¹⁰;
- Oxfordshire Biodiversity Action Plan¹¹; and
- Cherwell Corporate Biodiversity Action Plan 2016-18¹².

Guidance

10.2.5 The following guidance is relevant to the Development:

- BS 42020:2013. Biodiversity – Code of practice for planning and development¹³;
- BS 5837:2012. Trees in relation to design, demolition and construction. Recommendations¹⁴.
- CIEEM 2018 (Updated September 2019). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine¹⁵; and
- Bat Conservation Trust (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). February, 2016.

10.3 Assessment Methodology

Consultation

10.3.1 Table 10.1 summarises key comments raised by consultees of relevance to this assessment and how the assessment has responded to them.

Table 10.1: Consultation Response Summary

Consultee and Comment	Response
<i>Campaign for Rural Environment 8th July 2021</i>	
CPRE note the commitment to update existing EIA documents submitted for phases 1 and 2 of the Axis development as it impacts on biodiversity including consideration for designated sites (to include statutory and non – statutory) as well impacts and mitigation for on-site habitat and species. CPRE would expect up-to-date surveys to be conducted relating to this development. All surveys should cover important ecological features, for example endangered farmland birds and	<p>Tyler Grange have completed relevant update surveys to underpin this ES chapter covering ecological impacts and mitigation.</p> <p>Brown Hairstreak surveys are not considered necessary as the habitats present are considered to be unsuitable for this species.</p> <p>The biodiversity net gain calculations uses the Warwickshire, Coventry and Solihull Biodiversity Offsetting BIA Calculator v18. The biodiversity net gain assessment uses this</p>

Consultee and Comment	Response
<p>venerable trees. We would expect the ES to provide a biological impact assessment and appropriate mitigations. As required by Policy ESD10, CPRE would expect a site survey for the brown hairstreak butterfly.</p>	<p>calculator over DEFRA 2.0 or 3.0 due to the fact that the previously approved Axis J9 development used this calculator and it has been agreed with CDC that we can assess biodiversity net gain in combination across the three phases.</p>
<p><i>Environment Agency 15th July 2021</i></p>	
<p>We support the intention to provide Green Infrastructure within this development and a biodiversity net gain. The applicant may find it useful to refer to the Natural England publication Biodiversity Net Gain Metric 3.0 which was updated on 7th July 2021 and is available through the following link Biodiversity Metric 3.0.</p> <p>In addition, the scoping report does not include details of how the ES will demonstrate that it has given regard to the Water Framework Directive and objectives of the river basin management plan for this area. The site lies within the Thames River basin management plan and the ES should include details of the current overall classification of the relevant waterbody and how the development will ensure there is no deterioration to the current status and how it can contribute to ensuring the water body achieves good ecological status.</p>	<p>The biodiversity net gain calculation will use the DEFRA 2.0 metric due to DEFRA 3.0 still possessing glitches which can provide inaccurate readouts. This has been agreed with CDC.</p> <p>The Water Framework Directive is not relevant as no watercourses are being impacted.</p>
<p><i>Natural England 14th July 2021</i></p>	
<p>Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. Guidelines for Ecological Impact Assessment (EclA) have been developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) and are available on their website.</p>	<p>This chapter takes note of the guidance set out by CIEEM and emphasised by Natural England and assesses the effects on all relevant ecological features (including those that fall into the categories listed in the NE consultation letter) that are within the Zone of Influence of the Development.</p>

Consultee and Comment	Response
<p>Natural England advises that the assessment should cover:</p> <ul style="list-style-type: none"> • Internationally and Nationally Designated Sites • SSSIs • Regionally and Locally Important Sites • Protected Species • Habitats and Species of Principal Importance • Cumulative Effects 	
<i>Naturespace 30th July 2021</i>	
<p>Naturespace advise that the applicant should provide a Naturespace report/certificate with the application or alternatively provide an ecological assessment of the site and surrounding landscape to further assess the impacts of the proposed development on GCN and set out a strategy for addressing those impacts within the EIA. This area is important for connectivity through the landscape (as demonstrated in the picture above) and the impacts on this need to be adequately assessed, avoided/mitigated/compensated for.</p>	<p>The ES chapter contains an assessment of GCN presence within the zone of influence of the Site, an assessment of potential impacts and a suitable mitigation strategy.</p>
<i>Cherwell District Council 3rd August 2021</i>	
<p>Ecological surveys for all species and habitats from previous years can be referred to but they should be updated unless there is a fully justified reason not to do so. Cumulative impacts with other developments on both species and habitats and an assessment of cumulative impacts on designated and local sites both ecologically and indirectly such as considering increased recreational pressure should be carried out.</p> <p>The assessment of Biodiversity Net Gain should be carried out using a recognised metric and should show the extent of net gain achievable on site. CDC currently seeks a net gain of at least 10% on all</p>	<p>We have undertaken an update Phase 1 habitat survey and eDNA survey for GCN to inform this chapter. No other update surveys were considered necessary due to a lack of potential impact pathways as set out in the chapter below.</p> <p>The biodiversity net gain calculations uses the Warwickshire, Coventry and Solihull Biodiversity Offsetting BIA Calculator v18. The biodiversity net gain assessment uses this calculator over DEFRA 2.0 or 3.0 due to the fact that the previously approved Axis J9 development used this calculator and it has been agreed with CDC that we can assess biodiversity net gain in combination across the Site and Axis J9 development.</p>

Consultee and Comment	Response
<p>development sites. Information on how this might be fulfilled should also be included within the ES. The biodiversity section should also demonstrate how the development will fit in with the Eco Town in terms of green infrastructure and the overall masterplan within the SPD such that coherent networks for wildlife are achieved.</p>	<p>The assessment also sets out how the retention of existing vegetation and newly proposed habitats link with the masterplan and biodiversity strategy for Bicester Eco Town.</p>

Study Area and Scope

- 10.3.2 The study area is defined by the Zone of Influence (ZoI) of the Development. The study area is broadly confined to the Site itself and the immediate surrounding area. In accordance with best practice guidance (CIEEM, 2019), potential effects that could occur at greater distances were assessed with respect to international statutorily protected sites and national statutorily and non-statutorily protected sites up to 5km and 2km, respectively, from the development Site. In addition, potential effects to protected and priority fauna species within 2km have been considered.
- 10.3.3 The indicative delivery programme for the Development is estimated to be approximately one year. Subject to planning permission, construction is anticipated to commence in Q1 2022 and be complete by Q2 2023. Phase 1 of the Axis J9 development is now complete. It is anticipated that construction of Phase 2 will be complete by Q1 2022.
- 10.3.4 It is assumed the completed Development will become operational in 2024.

Establishing Baseline Conditions

- 10.3.5 To determine the important ecological features within the study area, a combination of desk-based research and surveys was undertaken.

Data Search

- 10.3.6 Protected and priority species records were obtained for the area within a 1km radius of the Site. This set out to collate existing ecological baseline information available in the public domain and information held by relevant third parties to inform this chapter. Areas around the Site to which searches for information were undertaken varied depending on the ecological resource considered, in accordance with current best practice guidance.
- 10.3.7 The following information was requested from Thames Valley Environmental Records Centre ('TVERC'):
- Records of legally protected and notable species; and
 - Records of non-statutory sites designated for nature conservation value within 2km of the Site.
- 10.3.8 The online Multi-Agency Geographic Information for the Countryside ('MAGIC') database was consulted (which utilises data provided by Natural England) for records of statutory designated sites and woodland listed on the Ancient Woodland Inventory within 2km of the

Site. This search was extended to 10km for Natura 2000 sites (Special Areas of Conservation ('SAC') and Special Protection Areas ('SPA') and Ramsar sites.

Phase 1 Habitat Survey

- 10.3.9 A Phase 1 habitat survey of the Site was carried out on 16th June 2021 by Tyler Grange. The survey covered the entire Site, including boundary features, and was undertaken in appropriate weather (dry conditions with wind reaching 1 on the Beaufort scale, 4/8 cloud cover and 11°C). Trees within and adjacent to the Site were assessed for their suitability to support roosting bats.
- 10.3.10 Habitats were described and mapped following the standard Phase 1 habitat survey methodology. Phase 1 habitat survey is a standard technique for classifying and mapping British habitats. The dominant plant species were recorded, and habitats identified according to their vegetation types. Where appropriate consideration was given to whether each habitat would qualify as a Habitat of Principal Importance following habitat descriptions published by the Joint Nature Conservation Committee (JNCC).
- 10.3.11 Target notes were made where specific features of ecological interest (e.g., invasive plants) were identified or where habitat features were too small to be mapped.

GCN Survey - Environmental DNA Analysis

- 10.3.12 A Habitat Suitability Assessment (HSI) of pond P1 (Figure 10.1) which is located off site approximately 180m south west of the Site boundary. Ponds P2 and P3 were not accessible, and the on-site ditches were dry and not subjected to an HSI assessment/eDNA assessment.
- 10.3.13 All waterbodies considered likely to have potential to support great crested newt were subject to an environmental DNA (eDNA) analysis where access was possible (see Appendix 10.3 for full methods). This is an approach approved by Natural England for providing a rapid means of establishing the likely presence/absence of GCN in a waterbody.
- 10.3.14 Water samples were taken from the waterbody on 16th June 2021 by an experienced GCN surveyor and Natural England Licence Holder Christian Cairns¹. Sterile kits provided by Nature Metrics Ltd were used, following standard methodology to prevent contamination of the samples¹⁶.

¹ BSc MSc (Licence number 2017-28614-CLS-CLS)

Figure 10.1: Pond Location Plan



- Legend**
- Site Boundary
 - Phase 1**
 - A Arable
 - Dry Ditch
 - Intact Species Poor Hedgerow
 - Pond
 - Scattered Broadleaved Tree

	0 50 100 m
Project	Axis J9 - Phase 3
Drawing Title	Pond Location Plan
Scale	As Shown (Approximate)
Drawing No.	10706/P02a
Date	September 2021
Checked	AG/CC



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Bat Surveys

Ground Level Preliminary Bat Roost Assessment Surveys

- 10.3.15 A ground level preliminary bat roost assessment ('PBRA') survey of all trees present on-Site was completed following the Bat Conservations Trust's Good Practice Guidelines (2016)¹⁷.
- 10.3.16 The PBRA for the trees required the surveyor to assess the trees present on-Site in line with the criteria provided in Table 10.2.

Table 10.2 Tree Assessment Criteria (adapted from BCT Guidelines, 2016)

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on-Site likely to be used by roosting bats.
Low	A tree of sufficient size and age to contain Potential Roosting Features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection conditions and surrounding habitat.

- 10.3.17 Bat activity transect and static monitoring surveys were completed in 2017 to underpin the 2017 Appeal Application and 2017 Residential Application. The methodology and results are set out in Appendix 10.4.

Identifying Likely Significant Effects

Evaluation of Ecological Resources

- 10.3.18 The evaluation of ecological resources was made with reference to the guidance on ecological impact assessments published by CIEEM 2019¹⁸. This methodology applies to both the construction phase and completed development. This process included:
- Identifying those ecological features likely to be affected; and
 - Evaluating the features to identify those of importance, i.e., those which if their integrity or conservation status were affected, national or local policies (or in some cases legislation) would be triggered.
- 10.3.19 The level of importance of specific ecological receptors was assigned using a geographic frame of reference using the following terms: International; National; Regional; County; District; Local; and/or within the Site boundary only.

Cumulative Effects

- 10.3.20 The methodology for the cumulative assessment follows that set out for the main assessment. The Zone of Influence 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 Development

10.3.21 The list of schemes which require consideration (as agreed with CDC) is set out section 10.8.

Determining Effect Significance

Sensitivity of Receptor

10.3.22 The Ecological Impact Assessment (EclA) guidelines do not require the sensitivity of the receptor to be assessed, the receptor is described in terms of its ecological value on a geographical scale which is determined through professional judgement and is based on factors such as quality and extent of a habitat, or the rarity of a habitat or species. To more accurately define the level of importance of an ecological feature, the geographical scale referenced in the guidelines (CIEEM, 2019) was applied as set out in Table 10.3.

Table 10.3: Receptor Sensitivity Descriptors

Value (Sensitivity)	Descriptor (CIEEM Equivalent)
Very	International
High	National
Medium	Regional, County
Low	District, Parish/Local
Very Low	Within ZOI only

Magnitude of Effect

10.3.23 Impacts were described with reference to the following characteristics where relevant:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

10.3.24 Magnitude refers to extent, amount, intensity, and volume. It is quantified where available data allows and is expressed in absolute or relative terms e.g., the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.

Assessing Significance

10.3.25 The significance of ecological effects uses terminology derived from CIEEM guidance. The approach is summarised below:

- **Designated Sites and Ecosystems:** Significant effects encompass impacts on structure and function of defined sites and ecosystems. For designated sites the focus

is whether the Development and associated activities are likely to undermine the site's conservation objectives or negatively affect the conservation status of the species or habitats for which the site is designated. For ecosystems, the focus is whether the Development is likely to result in a change in its structure or function.

- **Habitats and Species:** Consideration of conservation status is important for evaluating the significance of effects on individual habitats and species. Conservation status for habitats is determined by the sum of the influences acting on the habitat that may affect its extent, structure, and function as well as its typical species composition within a given geographical area. For species, it is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

10.3.26 To be consistent with the terminology used throughout the other chapters of this ES, potential and residual effects (adverse or beneficial) are defined in Table 10.4. These were then used in the summary table at the end of this chapter.

Table 10.4: Definitions of Significance Criteria for Ecology

Significance Criteria	Description of Criteria
Very Substantial Beneficial	A beneficial effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a regional level or above.
Substantial Beneficial	A beneficial effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a county level.
Moderate Beneficial	A beneficial effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a district level.
Minor Beneficial	A beneficial effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a site or local level.
Negligible	No significant effect on an important ecological feature.
Minor Adverse	An adverse effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a site or local level.
Moderate Adverse	An adverse effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a district level.
Substantial Adverse	An adverse effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a county level.
Very Substantial Adverse	An adverse effect on the conservation status of a defined site or ecosystem(s) and/or the habitats or species that is significant at a regional level or above.

Assumptions and Limitations

- 10.3.27 All surveys were undertaken within optimal timeframes and conditions, and as such, the results are not considered to be subject to any limitations.
- 10.3.28 Bat activity transect and static monitoring surveys were completed in 2017 to inform the 2017 Appeal Application and 2017 Residential Application. These surveys have not been updated as part of this application due to the fact no hedgerows or trees will be removed to facilitate construction or operation of the Development and the lighting scheme has been sensitively designed to avoid illumination of areas of commuting and foraging habitat.
- 10.3.29 It was not possible to access Ponds P2 and P3 (see Figure 10.1), but this is not considered to be a significant limitation as the impacts and mitigation assume that GCN are present within these ponds based on historical data.

10.4 Baseline Conditions

- 10.4.1 The Site lies within the Natural England National Character Area (NCA) 108 'Upper Thames Clay Vales' which encompasses a broad belt of gently undulating farmland on predominantly clay soils. The area contains contrasting landscapes, including enclosed pastures of the claylands with wet valleys, mixed farming, hedges, hedge trees and field trees and more settled, open, arable lands.
- 10.4.2 Habitats present within the Site itself includes arable farmland, hedgerows with standard trees, field margins and ditches. The habitats surrounding the Site include residential development associated with the western fringe of Bicester to the east and arable farmland bounded by hedgerows to the north, south, and west. There is also an area of mixed plantation woodland next to the Site's north western boundary and three ponds within 500m (see Figure 10.1).

Designated Sites

- 10.4.3 The data search confirmed that the Site is not covered by any statutory or non-statutory site designations in respect of wildlife and nature conservation. There are two statutory wildlife sites that are located within 2km of the Site.
- Bat Ardley Cutting and Quarry Site of Special Scientific Interest (SSSI) is located approximately 1.8km north west of the Site and is designated for its limestone grassland, scrub, ancient woodland, and wetland habitats as well as its invertebrate assemblage and population of great crested newt *Triturus cristatus*. As SSSIs are designated for supporting nationally important areas of habitat, this SSSI is considered to be of national ecological importance; and
 - Bure Park Local Nature Reserve (LNR) is located approximately 1km north east of the Site. The LNR incorporates the River Bure and supports ponds, hedgerows, scrub, and grassland. A population of GCN is also present. It is considered to be of district ecological importance
- 10.4.4 There is one non-statutory site within the search area:
- Bicester Wetland Reserve Local Wildlife Site (LWS) is located approximately 2.7km south east of the Site and provides habitat for an assemblage of wetland birds, invertebrates, and mammals. As it meets the criteria for the selection of Local Wildlife

Sites in Berkshire, Buckinghamshire, and Oxfordshire¹⁹, it is considered to be of up to county ecological importance.

Habitats

- 10.4.5 The habitats relevant to the assessment are listed below and summarised along with a description of the composition of the main plant species present and an assessment of ecological importance. The location of these habitats is provided on Figure 10.2.

Arable

- 10.4.6 The Site was dominated by a single arable field with narrow grassland / tall ruderal margins. The arable field is intensively managed for cultivation of a cereal crop and supports very few plant species and is therefore considered to be of negligible ecological importance.

Field Margins

- 10.4.7 There are field margins at the perimeter of the arable field which are approximately 1m wide although in the north west and north east corners of the field this extends to 2-3m. Species recorded include cleavers *Galium aparine*, dock *Rumex* sp., creeping thistle *Cirsium arvense*, sow-thistle *Sonchus* sp., common Nettle *Urtica dioica*, shepherd's-purse *Capsella bursa-pastoris* and common comfrey *Symphytum officinale*. Arable field margins are listed in Section 41 of the NERC Act 2006 as a Habitat of Principal Importance (HoPI). However, given the limited extent of the margins, the fact they are largely overshadowed by the adjacent hedgerows and the apparent lack of management for the benefit of wildlife, they are unlikely to qualify as a priority habitat and as such are considered to be of negligible ecological importance.

Figure 10.2: Habitat Features Plan



Legend

-  Site Boundary
- Phase 1**
-  Arable
-  Dry Ditch
-  Intact Species Poor Hedgerow
-  Scattered Broadleaved Tree



Project	Axis J9 - Phase 3
Drawing Title	Habitat Features Plan
Scale	As Shown (Approximate)
Drawing No.	10706/P01a
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Hedgerows

10.4.8 There are three hedgerows present at the Site which demarcate the northern, western, and eastern boundaries of the arable field (Figure 10.2). A description of their structure and species composition is provided below:

- Hedgerows H1 and H2 and H10: are located at the Site's northern and eastern boundaries. These hedgerows were found to have a dense structure during update survey and appear to have received no recent management. The hedgerows are all broadly dominated by hawthorn *Crataegus monogyna* with blackthorn *Prunus spinosa*, dog-rose *Rosa canina*, elder *Sambucus nigra*, buckthorn *Rhamnus cathartica* and bramble *Rubus fruticosus*. Where hedgerows H1 and H2 meet, a pocket of young sycamore *Acer pseudoplatanus* dominates. Climbers present include hedge bindweed *Calystegia sepium*, bittersweet *Solanum dulcamara* and black bryony; and
- Hedgerow H3 lies along the northern section of the western Site boundary and has received no recent management, although evidence of historical management is present in the form of laid ash *Fraxinus excelsior*. The hedgerow appears to be established on a compacted soil and stone-built bund, which also forms part of the bank to the adjacent ditch. This hedgerow was found to be overgrown and dense during the update survey and appears to have received no recent management. Species present within the hedgerow include hawthorn, blackthorn, and field maple *Acer campestre* with occasional dogrose, privet *Ligustrum vulgare* and bramble. Trees present within the hedgerow include young to semi-mature ash, willow *Salix* sp., sycamore, and two mature ash trees.

10.4.9 Hedgerows are listed in Section 41 of the NERC Act 2006 as a HoPI and based on the criteria listed in the UK Priority Habitat Descriptions, all the hedgerows on the Site are likely to qualify as such. Only hedgerow H3 potentially qualifies as important under the Hedgerows Regulations 1997 due to the diversity of species present, the presence of associated features including a dry ditch and mature trees. Overall, the hedgerow network present at the Site provide a network for mobile species and are irreplaceable in the short-term. The hedgerows present on-site are considered to be of up to local ecological importance.

Ditches

10.4.10 There are two ditches present just off-site, which are associated with hedgerows H1, H2 and H3 (Figure 10.2). All of the ditches are shallow and narrow (approximately 0.5m to 0.75m deep and 1m wide) and were found to be dry during the survey. No aquatic vegetation was present in any of the ditches, and none appeared to have recently supported water. The majority were also overgrown and found to be dominated by tall ruderal vegetation from the adjacent field margins as well as woody species associated with the hedgerows. As the ditches appear to rarely hold water and support no aquatic plant species, they are considered to be of negligible ecological importance.

Trees and Woodland

10.4.11 There are several trees present within or adjacent to the hedgerows present on-Site. Species are common and widespread in the locality and include oak, ash, sycamore, and field maple. The trees within the Site are semi-mature and none are considered to be veteran specimens. A thin strip of mixed plantation woodland lies adjacent to the north west

boundary. The trees present on-Site, and woodland are considered to be of up to local ecological importance.

Ponds (off-site)

- 10.4.12 There are three ponds present within a 500m radius of the Site (Figure 10.1). The closest of which (Pond P1) is approximately 180m from the Site's western boundary. The pond was recorded as having a surface area of approximately 120m² and was of a sufficient depth to avoid regularly drying out. Water quality was noted as being good with a range of invertebrates present, although there was limited aquatic vegetation present. The pond is subject to a high degree of overshadowing from the trees in the surrounding copse and there is limited aquatic or marginal vegetation
- 10.4.13 No detailed information is available on the additional ponds (Pond P2 and P3 which are located approximately 260m north-west and 370m south-east of the Site boundary respectively) due to access limitations.
- 10.4.14 The ES for two adjacent sites listed below both found a medium population of GCN in Pond P2.
- Himley Village (year 2011) (Cumulative Scheme No. 2); and
 - Land Adjacent to Bicester Road (year 2014) (Cumulative Scheme No. 4).
- 10.4.15 Please refer to Appendix 3.4 for the location of these schemes.
- 10.4.16 Ponds are listed are listed in Section 41 of the NERC Act 2006 as a HoPI. The ponds are known to support populations of GCN which are listed on Annexe II of the Habitats Directive and are therefore likely to qualify as example of priority habitat. Both ponds are considered to be of up to local ecological importance.

Species

- 10.4.17 There are several species groups relevant to the assessment which have been identified during the survey work. Updated surveys completed in June 2021 have informed the assessment of the likely continued presence or absence of these species' groups based on the suitability of the habitat present on-site as well as the updated data search with TVERC. A description of the known data for each species or species group is provided below along with an assessment of their ecological importance.

Amphibians

- 10.4.18 The ditches present off Site were dry at the time of the June 2021 survey and did not appear to have recently held any water. There was also a lack of aquatic and marginal vegetation. The ditches are therefore sub-optimal for GCN.
- 10.4.19 Pond P1 was subject to previous specific survey work in 2001 and 2003, which identified a `medium` population (10-100 individuals) of GCN. The update eDNA survey of Pond P1 undertaken in June 2021 confirmed that GCN are still present in the pond. The 2001 and 2003 survey work at Pond P2 and P3 the Site identified `small populations` of GCN, although it is likely that these GCN exist as a single metapopulation.

- 10.4.20 There is no aquatic habitat present on-Site that could form a potential breeding pond for GCN. The terrestrial habitats present on-Site are limited in both extent and suitability for GCN. However, given the presence of a pond directly adjacent to hedgerows and ditches which are connected to habitats present on-Site, there is potential for GCN to occasionally use the hedgerows bases and field margins.
- 10.4.21 The confirmed breeding population in Pond P1 was classed as 'medium' in 2003 and although no update population size class survey have been possible, it is unlikely that the population is likely to exceed this due to the size of the pond and distance from the other ponds where 'small' populations were identified.
- 10.4.22 GCN are protected under both European and domestic legislation and are also listed as a Species of Principal Importance (SoPI) and although widespread, have suffered declines in the UK. The meta-population that may occasionally use habitat present on the Site is considered to be of district ecological importance.

Badger

- 10.4.23 No evidence of badger activity was recorded during the June 2021 extended Phase 1 survey. The TVERC data search returned three badger records from within 1km of the Site, two which were for road kill. However, there is a single record for a sett from reported in 2010 that is located directly adjacent to Pond P1 approximately 180m south west of the Site.
- 10.4.24 The field margins and hedgerows may be used by foraging badgers, although no evidence of this was recorded during the survey. Whilst badgers are protected under the Protection of Badgers Act 1992, they are common and widespread and are therefore considered to be of negligible ecological importance.

Bats

- 10.4.25 The trees present within and directly adjacent to the Site boundary are considered to have negligible potential to support roosting bats and no buildings or other structure that may provide habitat for roosting bats are present.
- 10.4.26 The hedgerows link up to both other linear features and areas of woodland and parkland habitat to the north west and south of the Site respectively and thus provide some potential to act as foraging and commuting routes for bats.
- 10.4.27 The data search from TVERC returned records for noctule bat *Nyctalus noctule*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bat *Plecotus auritus* from 2013 which are all listed as SoPI, as well as additional records of common pipistrelle *Pipistrellus pipistrellus* from 2013 and 2014.
- 10.4.28 Overall, the majority of the Site comprises cleared arable land which is of limited potential to bats. The hedgerows present on-Site offer potential commuting routes to adjacent areas of woodland habitat as well as limited foraging opportunities. Activity surveys were undertaken by Tyler Grange in 2017 to inform the 2017 Appeal Application where common pipistrelle, soprano pipistrelle, noctule and *Myotis* sp. were all identified to be using the hedgerows and boundary features.

- 10.4.29 Given the nature and extent of the habitats present and the presence of superior quality habitat in the vicinity of the Site and the low activity levels of common and widespread bat species, the bat assemblage associated with the hedgerows present on Site is considered to be of up to local ecological importance.
- 10.4.30 As the hedgerows which are all being retained and buffered with green infrastructure within the design, no further update survey work was considered to be necessary.

Birds

- 10.4.31 The data search from TVERC includes records for species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), those red listed on the Bird of Conservation Concern²⁰ Species that could use the habitat present on-Site include lapwing *Vanellus vanellus* and linnet *Linaria cannabina*.
- 10.4.32 The habitats present on Site that are likely to be most valuable to foraging and nesting birds are the arable land, trees, hedgerows, and field margins. These habitats are common and widespread in the area. The Strategic Environmental Report (SER)²¹ produced for the wider Bicester Eco-Town Masterplan references a number of breeding bird territories which includes species of concern although their exact locations are unclear. Given that there is no evidence to suggest that the Site supports a diversity and abundance of species that is of greater importance than the surrounding area, the breeding and wintering bird assemblages at the Site are considered to be of local ecological importance.

Invertebrates

- 10.4.33 The data search from TVERC includes several records for invertebrates listed as Priority Species. The majority of the records do not have detailed grid references, but the partial references indicate that the records lie within a 1km grid square that partly incorporates the Site including grizzled skipper *Pyrgus malvae*, white-letter hairstreak *Satyrus w-album*, small blue *Cupido minimus*, wall *Lasiommata megera* and small heath *Coenonympha pamphilus*.
- 10.4.34 The species likely to be present on Site are only those that are common and widespread as the habitats present are of limited suitability for invertebrates. The invertebrate assemblage present at the Site is therefore considered to be of up negligible ecological importance.

Reptiles

- 10.4.35 The data search from TVERC reported records of common lizard *Zootoca vivipara* and grass snake *Natrix natrix* from within 0.1km of the Site as well as a single record of a slow worm *Anguis fragilis* 1.8km south of the Site. Habitats present at the Site that are suitable for reptiles is limited to the field margins as well as the edges of the hedgerows which provide shelter foraging and basking opportunities.
- 10.4.36 Given the limited extent of suitable habitat which would only support low numbers of common and widespread reptile species, the reptile assemblage potentially associated with the Site is considered to be of up to local ecological importance.

Other Mammals

- 10.4.37 Specific survey work for hazel dormouse *Muscardinus avellanarius* was completed by Arup in 2010 to inform the SER for the wider Bicester Eco-Town Masterplan which included surveys of hedgerow H3. No evidence of hazel dormouse was found, and no records were returned in the TVERC data search. Given the lack of evidence of their present and the fact that the hedgerows are being retained as part of the design, Hazel dormouse are subsequently not considered further in this assessment.
- 10.4.38 The ditches present on-Site were dry at the time of the June 2021 update survey and did not appear to have recently held any water. There was also a lack of aquatic and marginal vegetation and the general depth of all of the ditches is too shallow for water voles which generally require watercourses that regularly hold water at least 1m deep. The TVERC data search returned several records for water vole *Arvicola amphibius*, the nearest of which is from approximately 1km north east of the Site associated with habitats at the Bure Park LNR. Given there are no suitable habitats present on Site, water vole are not considered further within this assessment.
- 10.4.39 The on-site habitats are not considered suitable to support any other protected or notable species than those described above, and no other species are discussed within this report.

Summary of Receptors and Sensitivity

- 10.4.40 Table 10.5 provides a summary of all the ecological receptors along with their associated ecological importance and sensitivity.

Table 10.5: Summary of Receptor Sensitivity

Receptor	Ecological Importance	Sensitivity (Value)
<i>Designated Sites</i>		
Bat Ardley Cutting and Quarry SSSI	National	High
Bure Park LNR	District	Low
Bicester Wetland Reserve LWS	County	Medium
<i>Habitats</i>		
Arable	Negligible	Very Low
Field Margins	Negligible	Very Low
Hedgerows	Local	Low
Ditches	Negligible	Very Low
Trees	Local	Low
Ponds (off-site)	Local	Low
<i>Species</i>		
Amphibians	District	Low
Badger	Negligible	Very Low
Bats	Local	Low
Birds	Local	Low
Invertebrates	Negligible	Very Low
Reptiles	Local	Low

10.5 Scheme Design and Management

- 10.5.1 The design of the Development has been iterative and, in accordance with policy and best practice guidance (NPPF⁸ and BS 42020:2013), has followed the 'mitigation hierarchy'. This seeks as a preference to avoid ecological impacts, then to mitigate unavoidable impacts, and, as a last resort, to compensate for unavoidable residual impacts that remain after avoidance and mitigation measures.
- 10.5.2 The Development has been designed to avoid and retain the most important ecological features to ensure they can be managed long-term to maximise their biodiversity potential. Where this is not possible, new habitats are proposed to compensate for habitat losses, to deliver overall biodiversity gain.
- 10.5.3 Where relevant, mitigation and enhancement measures refer to the overall Biodiversity Strategy for the North West Bicester Eco Town Masterplan which is set out in Section 5 of the North West Bicester Green Infrastructure and Landscape Strategy Part 2. Central to the mitigation and enhancement strategy is the provision of native habitats of higher quality than habitats already present and species-specific mitigation strategies, as required.

Construction

- 10.5.4 The impacts below assume the implementation of a CEMP which will be secured through planning condition. Where relevant to the assessment, examples of measures that would be included to avoid, reduce, or mitigate potential impacts are provided. The CEMP will include:
- 10.5.5 In addition to the ES, the planning application is accompanied by a series of technical reports, including:
- All retained trees and hedgerows will be protected in accordance with BS 5837:2012/16.
 - GCN: Sensitive timing of works, habitat manipulation, fingertip searches, destructive search of habitat to be removed and ecological supervision of works potentially affecting GCN.
 - Badgers: Pre-construction badger survey, sensitive timing of works, careful storage of topsoil and materials, and a method statement to avoid any disturbance to setts (if required following the pre-construction survey).
 - Breeding Birds: Removal of vegetation outside of the nesting bird season (March to August inclusive), or the supervision of vegetation removal by a suitably qualified ecologist should works take place within this period.
 - Western European Hedgehog: Supervised removal of suitable habitat to ensure no individual hedgehogs are affected during site clearance.

Completed Development

- 10.5.6 The following design measures represent primary mitigation of relevance to the biodiversity assessment. The planting strategy for the Site is shown on the Landscape Drawing (see Appendix 5.1).
- 10.5.7 The avoidance of removing habitats of ecological importance was factored into the design process along with habitat creation measures to ensure conformity with the Biodiversity

Strategy for the Bicester Eco Town Masterplan. The following habitat retention, creation and enhancement measures are embedded within the Development.

- Retention of the existing hedgerows and field margins (where possible) at the Site boundaries in line with the biodiversity strategy for the Bicester Eco Town.
- Native woodland and shrub planting at the Site boundaries.
- Provision of wildflower grassland within the swales and area adjacent to the SLR in the eastern section of the Site.
- The planting of 205 native trees.
- The external lighting has been designed to minimise light spill onto the adjacent retained vegetation (see Lighting Drawing, Appendix 5.1)

10.5.8 The creation and management of habitats within the Development will be set out in detail in a Landscape and Ecology Management Plan (LEMP). It is expected the LEMP will be secured via a planning condition.

Biodiversity Net Gain

10.5.9 As per the Bicester Eco Town SPD²², the Development must be accompanied by a completed biodiversity net gain metric. The approach agreed with CDC when preparing the biodiversity net gain metrics for the 2017 Appeal Application and 2017 Residential Application was to consider the level of gain/loss achievable across the area owed by the Applicant (i.e. the Axis J9 Development and the Site). The metric requested by CDC was the 'Warwickshire, Coventry and Solihull Biodiversity Offsetting: Biodiversity Impact Assessment Calculator v18²³' which is based on the Defra methodology. To ensure conformity with the previous applications (including the Reserved Matters applications approved for Phases 1 and 2 of the Axis J9 development), this metric is used in place of DEFRA 2.0 or DEFRA 3.0.

10.5.10 In summary, the following steps were taken to assess the 'habitat impact score' resulting from direct habitat losses and indirect effects associated with the scheme which were based on the Proposed Site Plan (see Table 5.2):

- The habitats currently present on-site were assessed and defined using the JNCC Phase 1 categories as described above;
- The extent or length of each habitat type present was calculated;
- The distinctiveness value for each habitat was assigned; and
- The condition of each habitat assessed based on the criteria provided in the Farm Environment Plan (FEP) manual produced by Defra²⁴.

10.5.11 The following steps were taken to assess the post-development 'habitat mitigation score':

- The extent or length of retained and newly created habitats were calculated based on the Landscape Drawing (see Appendix 5.1).
- The retained and newly created habitats were assessed for habitat distinctiveness, the estimated time until target condition is reached, the difficulty of creation/restoration, and their target condition.

- 10.5.12 The change in the number of 'biodiversity units'² is then calculated by subtracting the 'habitat mitigation score' from the 'habitat impact score' to assess if the development will deliver a net-gain in biodiversity in metric terms using the methods described above. This calculation is completed separately for non-linear and linear habitats.
- 10.5.13 As described within the biodiversity impact assessment calculator, based on the habitats present on the site area owned by the Applicant (i.e. the Axis J9 Development and the Site) that will be subject to direct/indirect effects, development of the site area would have a habitat impact score of 40.69. On the basis of the approved plans for the Axis J9 development and the planting strategy for the Development, overall the site area owned by the Applicant (i.e. the Axis J9 Development and the Site) will achieve a habitat mitigation score of 40.8 resulting in a net gain of +0.11 biodiversity units.
- 10.5.14 As set out in the linear impact assessment calculator, based on the linear habitats present on the site area owned by the Applicant (i.e. the Axis J9 Development and the Site) that would be subject to direct/indirect impacts, the development of the site area would have a linear impact score of 9.44. based on the partial loss of hedgerows. On the basis of the approved plans for the Axis J9 development and the planting strategy for the Development, overall the site area owned by the Applicant (i.e. the Axis J9 Development and the Site) will achieve a linear mitigation score of 10.85 resulting in a net gain of +1.41 biodiversity units.
- 10.5.15 The completed metric is set out in Appendix 10.2.

10.6 Construction Assessment of Effects

Designated Sites

- 10.6.1 Ardley Cutting and Quarry SSSI, Bure Park LNR and Bicester Wetland Reserve LWS are located approximately 1.8km, 1km, and 2.5km from the Site respectively. All of these designated sites are separated from the Site by arable farmland, existing residential development, and roads, so no direct effects on their structure and function are likely. Although all three designated sites are potentially hydrologically sensitive, there are no watercourses that link the Site with any of the sites and the scale and nature of the Development makes adverse hydrological effects unlikely. Construction of the Development will therefore result in negligible adverse effects on the structure or function of any statutory and non-statutory designated sites.

Habitats

- 10.6.2 Construction of the Development will require the permanent loss of habitats within the Site that were unavoidable through the design of the Development. These losses along with the significance of the effects are described for each habitat type below:

Arable

- 10.6.3 Construction of the Development will result in the permanent loss of approximately 7.23ha of arable habitat. This impact would subsequently result in an adverse effect on the conservation status of arable habitat which will be of negligible ecological significance.

² The biodiversity metric calculates values as 'biodiversity units'. Biodiversity units are calculated using the size of the habitat, its quality and location.

Field Margins

- 10.6.4 The Development will result in the partial loss of a section of the arable field margin associated with hedgerow H3 to allow for the planting of woodland planting in this area as part of the landscape screening strategy. The remaining field margins at the perimeter of the Site will be retained during construction to form a buffer between the area required for construction and the hedgerows. Factors important to maintaining the conservation status of field margins include the maintenance of their extent, botanical diversity, and connectivity to similar adjoining habitats. The partial loss of the field margin along hedgerow H3 will result in a permanent adverse effect on the conservation status of this habitat which would be of negligible ecological significance.

Hedgerows

- 10.6.5 Factors important to the conservation status of hedgerows include the maintenance of their extent and connectivity with woodland and other hedgerows in the surrounding landscape. The remaining hedgerows will be retained during construction and protected through measures adhering to BS 5837:2012¹⁶ that will be detailed in the CEMP. As such, no adverse significant effects (negligible in terminology used elsewhere in the ES) are expected.

Ditches

- 10.6.6 Ditch D1 and D2 will be retained during construction, as such, no adverse significant effects (negligible in terminology used elsewhere in the ES) are expected.

Trees

- 10.6.7 The trees present at the perimeter of the Site will be retained during construction and protected through measures adhering to BS 5837:2012¹⁶ that will be detailed in the CEMP. No significant adverse effects (negligible in terminology used elsewhere in the ES) are therefore expected.

Ponds (off-site)

- 10.6.8 The ponds described in the baseline are located outside of the Site and will not be subject to Site clearance activities during construction. The pond separated from the construction area by intervening habitats and the operational Axis J9 development. The CEMP will include measures to ensure that the risk of indirect effects such as pollution and sedimentation during construction is minimised. Following the implementation of the CEMP, there will be no significant adverse effects (negligible in terminology used elsewhere in the ES) on the conservation status of ponds resulting from construction activities.

Species

- 10.6.9 There are several species groups relevant to the assessment of potential construction phase effects which are described below along with an assessment of the significance of any identified effects.

Amphibians

- 10.6.10 Construction will not result in the direct removal of any aquatic habitat with potential to support GCN as the ditches were not found to be suitable and all ponds are located outside of the Site boundary. The location of a confirmed breeding pond 180m from the Site's

western boundary requires consideration of the potential impacts resulting from the removal and disturbance of terrestrial habitat in the vicinity of the pond.

- 10.6.11 The majority of the habitat being removed during construction comprises arable land which offers negligible opportunities for GCN and its removal during construction is unlikely to result in any adverse effects on this species. The remaining habitat on Site comprises hedgerows and field margins which will largely be retained and enhanced following construction.
- 10.6.12 Although the Development will largely affect habitats of negligible importance to GCN, there is a possibility that individuals could be found in suitable terrestrial habitat on Site and harmed during site clearance works, particularly in relation to the partial removal of the field margin associated with Hedgerow H3. Rather than apply for a European Protected Species Mitigation Licence (EPSML), it will be possible to prevent triggering protective legislation through the implementation of reasonable avoidance measures should be during construction to ensure that the risk of harming individual GCN is minimised. These measures will form part of the CEMP and in summary will include the following:
- Review of need to apply for an EPSML;
 - Habitat manipulation;
 - Finger-tip searches of habitat due to be removed;
 - Appropriate timing;
 - Ecological supervision of sensitive works; and
 - Contingency protocol in the event a GCN is encountered during construction.
- 10.6.13 Provided the measures described above are implemented, construction of the Development is unlikely to result in a significant adverse effect (negligible in terminology used elsewhere in the ES) on the conservation status of GCN potentially associated with the Site. In addition to the above measures, habitat creation and enhancement measure are described in the mitigation section below.

Badgers

- 10.6.14 No confirmed evidence of badgers was recorded during previous survey work, but it is possible they forage and pass through the Site. There is a single record for a sett was reported in 2010 that is located approximately 180m south west of the Site, although the sett category was not provided.
- 10.6.15 Construction will result in the limited loss of field margins which may be of value to foraging badgers, but the majority will be retained and enhanced following construction. The remaining habitats present on Site are of low suitability for foraging badgers. New setts may be dug during the period that elapses between planning permission being granted and Site clearance work commencing. Additional pre-construction surveys are therefore necessary to ensure that any new setts can be identified.
- 10.6.16 The CEMP will contain measures specific to the protection of badgers which will include the following:
- Pre-construction badger survey;
 - Method statement to ensure disturbance and destruction of setts is avoided;

- Review of the need to apply for a mitigation licence if the above cannot be guaranteed;
- Construction works limited to daylight hours;
- Trenches or deep pits will be covered, or a means of escape provided for badgers if left overnight; and
- Careful storage of topsoil / regular inspections.

10.6.17 Provided the measures described above are implemented, construction of the Development is unlikely to result in a significant adverse effect (negligible in terminology used elsewhere in the ES) on the conservation.

Bats

10.6.18 All hedgerows will be retained and enhanced following construction and the majority of the Site comprises arable land which is of limited value to bats. Construction of the Development is therefore unlikely to result in a significant adverse effect (negligible in terminology used elsewhere in the ES) on the conservation status of the bat population potentially associated with the Site.

Birds

10.6.19 Construction will result in the loss of approximately 7.23ha of arable land and the partial loss of the field margin associated with hedgerow H3. These habitats offer some nesting and foraging opportunities for a bird assemblage that includes farmland species such as lapwing and linnet. Site clearance activities could result in the disturbance and destruction of nests and juvenile birds if carried out during the active breeding season which would trigger relevant legislation under the Wildlife and Countryside Act 1981 (as amended). It is envisaged that the CEMP will include measures to mitigate this risk including limiting vegetation clearance to outside of the nesting season or necessitating the supervision of clearance activity if this is unavoidable.

10.6.20 Despite the implementation of the CEMP, construction will still result in the partial loss of habitat of value to the breeding bird assemblage comprising approximately 7.23ha of arable land. This would result in a permanent effect on the conservation status of the bird assemblage present at the Site which would be significant at the local level (not significant in terminology used elsewhere in the ES).

Invertebrates

10.6.21 The majority of habitat suitable for invertebrates will be retained, including the hedgerows and field margins at the perimeter of the Site. As a result, there will be no significant adverse effects (negligible in terminology used elsewhere in the ES) on the conservation status of invertebrates resulting from construction activities.

Reptiles

10.6.22 Construction will result in the partial and limited loss of habitat suitable for reptiles, including the partial loss of the field margin associated with hedgerow H3. The habitat losses are minor, and the majority of suitable habitat will be retained and enhanced following construction however, there is a low risk that common lizard and slow worm will be harmed during vegetation clearance activities. Due to the very limited areas of habitat requiring removal, full translocation is not deemed necessary. It is envisaged that the CEMP will include measures to avoid harm to individual reptiles occurring including:

- Habitat manipulation;
- Finger-tip searches of habitat due to be removed;
- Appropriate timing; and
- Ecological supervision of sensitive works.

10.6.23 Provided the measures described above are implemented, construction of the Development will not result in a significant adverse effect (negligible in terminology used elsewhere in the ES) on the conservation status of reptiles associated with the Site.

Other mammals

10.6.24 Construction will result in the loss of limited areas of habitat that may be used by western European hedgehogs although the majority of suitable habitat will be retained and enhanced following construction. Vegetation clearance activities may result in the harming of individuals. The CEMP will, therefore, include measures to safeguard hedgehogs during clearance including ecological supervision, contingency protocols, and timing restrictions. Following the implementation of the CEMP, there will be no significant adverse effects (negligible in terminology used elsewhere in the ES) on the conservation status of hedgehogs resulting from construction activities.

Mitigation, Monitoring and Residual Effects

10.6.25 The mitigation and compensation measures described below address the effects that have been identified as being significant in the construction impacts section and are provided under the equivalent sub-headings. Where the likely effects are considered to be negligible, no mitigation is required, and they are therefore not considered further in the assessment.

10.6.26 Reference to the wider biodiversity strategy for the North West Bicester Eco Town is made where relevant to the specified mitigation measures.

10.6.27 As required by the North West Bicester Eco Town SPD, a detailed Landscape and Habitats Management Plan (LEMP) including a comprehensive ecological monitoring programme will be produced and is expected to be controlled through a planning condition. It will set out objectives to minimise effects of disturbance once the construction is complete and the Development is occupied. It will also describe measures to maximise the biodiversity potential of retained and newly created habitats through appropriate management as well as a programme of monitoring to provide a mechanism to modify the management prescriptions if required.

10.6.28 The proposed habitat creation and enhancement measures are also shown on the planting strategy (Ref: 0897-RFM-XX-00-DR-L-0003).

10.6.29 The habitat creation and enhancement measures ensure the Development is compliant with relevant policies under Bicester 1 and ESD10 of the Local Plan as well as relevant policies in the SPD. This includes the enhancement and creation of new habitats that will link up with adjacent habitats to form wildlife corridors as per the biodiversity strategy for North West Bicester Eco Town. The main habitat retention and creation measures are set out in section 10.5.

Species

Amphibians

- 10.6.30 Although the construction phase effects on amphibians are not considered likely to be significant, habitat enhancement measures will be provided to increase the potential of the Site to support this species post-construction. These include the retention, increase in width and enhancement of the field margins associated with the retained hedgerows and new wildflower grassland and woodland planting to improve the quality of the terrestrial habitat for GCN. New aquatic habitat will also be provided in the form of two new swales. These enhancement measures will increase the extent of suitable terrestrial and aquatic habitat for GCN resulting in a positive effect on this species which will be significant at the local level (minor beneficial in terminology used elsewhere in the ES).

Bats

- 10.6.31 Although no significant effects are expected on the bat assemblage potentially associated with the Site, the enhancement strategy will provide new habitat planting including wildflower grassland, and woodland as well as wetland vegetation in the attenuation swales which ties in with the overall Biodiversity Strategy for the Bicester Eco Town Masterplan. The areas of retained/enhanced hedgerows and diverse grassland buffers, as well as the areas of new planting, will create a network of foraging and commuting habitat across the Site. The lighting scheme will also be sensitively designed to minimise light spill onto these habitats as well as the new roosting features. New artificial roosting features will also be provided in the form of bat bricks and bat boxes which will be located on new buildings and on retained trees. These enhancement measures will increase the extent of habitat for bats resulting in a positive effect on this species which will be significant at the local level (minor beneficial in terminology used elsewhere in the ES).

Birds

- 10.6.32 To mitigate the adverse effects on birds resulting from habitat loss, several measures will be implemented that tie in with the overall Biodiversity Strategy for Bicester Eco Town. Habitat retention forms part of the approach and the hedgerows and majority of field margins will be retained. New habitats will also be created including new hedgerow planting resulting in a net gain in the overall length, increased width of the field margins/buffers, new wetland habitat in the form of a swale and areas of species rich grassland. All of these areas will be managed to maximise their value to both nesting and foraging birds. New nesting opportunities will also be provided in the form of nest boxes to be installed on retained trees and new buildings.
- 10.6.33 It is only for farmland birds that the Strategic Environmental Report (SER) for NW Bicester Eco Town acknowledges that the overall adverse effect of the wider Eco-town development on farmland birds cannot be mitigated on-site. As such, the SER proposes a fund to secure off-site compensation and increase the 'carrying capacity' of local habitats for farmland birds through the appropriate habitat management. As part of the mitigation for the loss of approximately 7.23ha of arable habitat at the Site, which forms part of the overall foraging resource for farmland birds, the Development will make the relevant financial contributions at the appropriate stage.
- 10.6.34 Following implementation of these measures, the overall extent of foraging habitat and nesting opportunities will be increased resulting in a positive effect on birds which will be significant at the local level (minor beneficial in terminology used elsewhere in the ES).

10.7 Completed Development Assessment of Effects

10.7.1 Where relevant to the assessment, a summary of measures that will be included in the LEMP are provided in section 10.5 and shown drawing 0897-RFM-XX-00-DR-L-0003. The potential effects are considered in the absence of mitigation measures which are provided separately below. Only ecological features that are assessed as potentially being subject to significant effects as a result of the Development are described.

Species

Bats

10.7.2 Lighting associated with the completed Development could result in the disturbance of light sensitive bat species which could be dissuaded from using the artificial roost sites and retained/newly created foraging and commuting habitat. This would result in an adverse effect on the conservation status of the bat assemblage associated with the Site and would be significant at the local level (minor adverse in terminology used elsewhere in the ES) in the absence of mitigation.

Mitigation, Monitoring and Residual Effects

Species

Bats

10.7.3 To mitigate the potential adverse effects resulting from the illumination of the retained and newly created hedgerows as well as the artificial roost sites to be provided as part of the construction phase mitigation measures, a sensitive lighting scheme has been developed in conjunction with the appointed lighting engineers to ensure areas of value to bats are not excessively lit. The lux contour plans are shown on the Lighting Drawing (Appendix 5.1), which demonstrates that the retained hedgerows (H1 to H3 and H10) and the woodland adjacent to the northern boundary of the Site will not be illuminated above 0.5 lux. The proposed lighting comprises Light Emitting Diode (LED) columns which has less impact on bats than many other common forms of lighting, including sodium and mercury lamps. Following implementation of these measures, the residual effects will be reduced to a level that is not significant (negligible in terminology used elsewhere in the ES).

10.7.4 No further mitigation or monitoring is required in relation to the completed Development.

10.8 Cumulative Effects

10.8.1 The Development is part of the wider North West Bicester Eco Town Masterplan which will comprise development within 345ha of land to the north west of Bicester. Planning permissions relevant to the Eco Town area comprise:

- Bicester Eco-Town Exemplar, Banbury (Cumulative Scheme No.3);
- Himley Village (Cumulative Scheme No.2);
- Land Adjacent to Bicester Road and South West of Avonbury Business Park, Howes Lane, Bicester (Cumulative Scheme No.4);
- A4095 SLR (Cumulative Scheme No.10); and
- 2017 Appeal Application (Cumulative Scheme No.11).

- 10.8.2 Please refer to Appendix 3.4 for the location of these schemes and those mentioned below in relation to the Site.
- 10.8.3 As with the Site considered by this assessment, the above developments will be required to mitigate potential effects upon important ecological receptors and deliver a net gain in biodiversity in-line with the North West Bicester Masterplan SPD, 2016²³. It can also be expected that measures such as a CEMP would be in place during the construction stage to minimise ecological
- 10.8.4 The following developments are not part of the North West Bicester Eco-Town but are required to adhere to the legislative framework and both national and local policy with regards to biodiversity. Information relating to anticipated impacts and enhancements have been added, where known:
- Land North of Bicester Avenue Garden Centre Oxford Road Bicester (Cumulative Scheme No.5);
 - Tesco Pingle Drive Bicester OX26 6WA (Cumulative Scheme No.8);
 - Land to the east of M40 and south of A4095, Chesterton, Bicester, Oxfordshire (Cumulative Scheme No.12);
 - OS Parcel 2200 Adjoining Oxford Road North of Promised Land Farm Oxford Road Bicester (this site makes up the remainder of the Bicester 10: Bicester Gateway strategic allocation) (Cumulative Scheme No.13);
 - Site C Ploughley Road & Site D & E Ambrosden Road MOD Bicester Upper Arcott Oxfordshire (Cumulative Scheme No.14);
 - Land Adj To Promised Land Farm Wendlebury Road Chesterton (Cumulative Scheme No.15A);
 - Kingsmere Development (Cumulative Scheme No. 6) – no detailed information available, though the Planning Statement states that the proposals include mitigation measures to ensure that the development will not have any significant adverse effect on the environment;
 - Bicester Village Phase 4 (Cumulative Scheme No.7) - No EIA / Ecology Assessment in the initial application folder online, but the Ecology Officer comments have concluded no impacts; and
 - Kingsmere Village Phase 2 (SW Bicester) (Cumulative Scheme No.9) - The Development will result in a number of changes to the local environment, but a range of measures will be put in place to minimise potential significant adverse effects and enhance beneficial effects.

Construction

- 10.8.5 The Development will not result in any significant residual adverse effects that could interact with those resulting from other developments listed above and included with Appendix 3.4. It is, therefore, reasonable to assume that there are sufficient planning and legislative controls to ensure that, in combination with the Development, potential significant effects would be mitigated. Therefore, no significant adverse cumulative effects are expected (negligible in terminology used elsewhere in the ES).
- 10.8.6 It is only for farmland birds that the Strategic Environmental Report (SER) for NW Bicester Eco Town acknowledges that the overall adverse effect of the wider Eco Town development

on farmland birds cannot be mitigated on-site, with a significant adverse impact likely to be at a county level (substantial adverse in terminology used elsewhere in the ES). As such, the SER proposes a fund to secure off-site compensation and increase the 'carrying capacity' of local habitats for farmland birds through the appropriate habitat management. As part of the mitigation for the loss of approximately 7.23ha of arable habitat at the Site, which forms part of the overall foraging resource for farmland birds, the Development will make the relevant financial contributions at the appropriate stage. No significant adverse residual effects (negligible in terminology used elsewhere in the ES) are anticipated with this approach in the SER.

- 10.8.7 In terms of overall beneficial impacts, it appears to be too early to say with any confidence about whether all of the sites could deliver a beneficial cumulative impact, though this is a possibility if the commitments made so far are achieved.

Completed Development

- 10.8.8 The completed Development will not result in any significant residual adverse effects and will therefore not result in any cumulative effects in combination with the developments listed above and included with Appendix 3.4. Therefore, no significant cumulative effects are expected (negligible in terminology used elsewhere in the ES). In addition, beneficial cumulative impacts will be dependent on successful implementation of the commitments made so far by the other developments and is therefore not measurable at the time of writing.

Table 10.6: Summary of Residual Effects

Effect	Receptor (Sensitivity)	Geographic Scale	Temporal Scale	Magnitude of Impact	Mitigation and Monitoring	Residual Effect
Construction						
Designated Sites	Low to High	County to National	Temporary	Negligible	N/A	Negligible
Habitat - Arable	Very Low	Negligible	Permanent	Negligible	N/A	Negligible
Habitat – Field Margins	Very Low	Negligible	Permanent	Negligible	N/A	Negligible
Habitat – Hedgerows	Low	Local	N/A	Negligible	Adherence to BS5837:2012/ CEMP	Negligible
Habitat – Ditches	Very Low	Negligible	N/A	Negligible	Adherence to BS5837:2012/ CEMP	Negligible
Habitat – Trees	Low	Local	N/A	Negligible	Adherence to BS5837:2012/ CEMP	Negligible
Habitat – Ponds (offsite)	Low	Local	N/A	Negligible	Adherence to CEMP	Negligible
Species - Amphibians	Low	District	N/A	Negligible	Adherence to CEMP, new habitat planting	Minor Beneficial
Species - Badgers	Very Low	Negligible	N/A	Negligible	Adherence to CEMP	Negligible
Species - Bats	Low	Local	N/A	Negligible	Sensitive lighting scheme, new habitat planting	Minor Beneficial
Species – Birds	Low	Local	Permanent	Local/not significant	Adherence to CEMP,	Minor Beneficial

					contribution to offsite compensation, new habitat planting	
Species – Invertebrates	Very Low	Negligible	N/A	Negligible	Adherence to CEMP	Negligible
Species - Reptiles	Low	Local	N/A	Negligible	Adherence to CEMP	Negligible
<i>Completed Development</i>						
Species - Bats	Low	Local	Permanent	Minor Adverse	Implementation of a sensitive lighting scheme	Negligible
<i>Cumulative Effects</i>						
Construction - Loss of Breeding/Wintering Bird Habitat	Low	Local	Permanent	Substantial Adverse	Contribution to offsite mitigation	Negligible

References

- ¹ Wildlife and Countryside Act 1981. <https://www.legislation.gov.uk/ukpga/1981/69>
- ² The Conservation of Habitats and Species Regulations 2017. <http://www.legislation.gov.uk/uksi/2010/490/contents/made>
- ³ Countryside and Rights of Way Act 2000. <https://www.legislation.gov.uk/ukpga/2000/37/contents>
- ⁴ Protection of Badgers Act 1992. <http://www.legislation.gov.uk/ukpga/1992/51/contents>
- ⁵ The Hedgerows Regulations 1997. <http://www.legislation.gov.uk/uksi/1997/1160/contents/made>
- ⁶ Natural Environment and Rural Communities Act 2006. <https://www.legislation.gov.uk/ukpga/2006/16/contents>
- ⁷ Wild Mammals (Protection) Act 1996. <https://www.legislation.gov.uk/ukpga/1996/3/contents>
- ⁸ Department for Communities and Local Government, (Updated 2021). *National Planning Policy Framework*. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> Last accessed July 2021.
- ⁹ Cherwell District Council, Adopted September 2020. Cherwell Local Plan 2011 - 2031 Part 1 Partial Review. Available at: <https://www.cherwell.gov.uk/info/83/local-plans/215/adopted-cherwell-local-plan-2011-2031-part-1-partial-review---oxfords-unmet-housing-need> Last accessed July 2021.
- ¹⁰ Cherwell District Council, Re-adopted December 2016. Cherwell Local Plan 2011 - 2031 Part 1. Available at: <https://www.cherwell.gov.uk/info/83/local-plans/376/adopted-cherwell-local-plan-2011-2031-part-1> Last accessed July 2021.
- ¹¹ Oxfordshire's Biodiversity Action Plan and Conservation Target Areas
- ¹² Cherwell Biodiversity Action Plan 2016-18 <https://www.cherwell.gov.uk/downloads/file/320/cherwell-biodiversity-action-plan-2016-2018>
- ¹³ BSI Standards Publication (2013). BS 42020:2013 Biodiversity - code of practice for planning and development
- ¹⁴ BSI Standards Publication (2012). Trees in relation to design, demolition and construction – Recommendations
- ¹⁵ CIEEM (2019) Guidelines for Ecological Impact Assessment in the United Kingdom, Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management.
- ¹⁶ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA*. Freshwater Habitats Trust, Oxford

¹⁷ Bat Conservation Trust (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)*. February, 2016

¹⁸ CIEEM (2019). *Guidelines for Ecological Impact Assessment in the UK and Ireland (ver 1.1, September 2019)*. Chartered Institute of Ecology and Environmental Management. Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf> (last accessed: 19 August 2021)

¹⁹ Buckinghamshire and Milton Keynes Environmental Records Centre and Thames Valley Environmental Records Centre (2009). *Criteria for the Selection of Local Wildlife Sites in Berkshire, Buckinghamshire and Oxfordshire*. Available at: <http://www.tverc.org/cms/sites/tverc/files/LWS%20criteria%20Nov%2009.pdf> (last accessed: 19 August 2021)

²⁰ Birds of Conservation Concern 4 (2015) https://www.bto.org/sites/default/files/shared_documents/publications/birds-conservation-concern/birds-of-conservation-concern-4-leaflet.pdf

²¹ NW Bicester Masterplan Environmental Statement Strategic Environmental Report – Volume 1: Main Text

²² Bicester Ecotown SPD <http://modgov.cherwell.gov.uk/documents/s31171/Appendix%204%20-%20North%20West%20Bicester%20SPD%20-%20Final%20Draft%20November%202015.pdf>

²³ Warwickshire, Coventry and Solihull Biodiversity Offsetting: Biodiversity Impact Assessment Calculator v18 <http://heritage.warwickshire.gov.uk/files/2013/06/Guidance-for-Biodiversity-Impact-Assessment-calculatorv18.pdf>

²⁴ Higher Level Stewardship Farm Environment Plan Manual (Defra, 2010) <http://adlib.eversite.co.uk/resources/000/251/202/NE264.pdf>