Land off Ashmead Drive, Gotherington

Ecological Appraisal

Prepared by:
The Environmental Dimension Partnership Ltd

On behalf of:
L&Q Estates

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Report Reference
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Contents

Appendices

Plans

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	Author	**Formatted**	**Peer Review**	**Proofed by/Date**
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Executive Summary

S1 The Environmental Dimension Partnership Ltd (EDP) was instructed by L&Q Estates ('the applicant') to undertake an ecological appraisal to inform proposals for a proposed residential housing development on Land off Ashmead Drive, Gotherington, Gloucestershire.

S2 The site occupies approximately 6.28 hectares (ha) and consists primarily of a larger arable field and a smaller area of semi-improved grassland. The northern, eastern and western edges of the site are bounded by residential houses and roads accessed via Malleson Road, whilst arable fields form the boundary of the southern edge of the site.

S3 The baseline ecological investigations undertaken in September and October 2015 as part of the appraisal included a desk study, Extended Phase 1 Survey and detailed (Phase 2) surveys relating to bats and reptiles. Update bat surveys were undertaken in May 2016. All surveys were undertaken with reference to best practice guidance where this exists.

S4 Further update surveys were undertaken during September 2019, including an updated desk study, extended phase 1 survey and bat activity surveys.

S5 The results of the desk study indicate that there are no statutory or non-statutory designated sites of nature conservation importance located within or immediately adjacent to the site that are likely to be negatively affected by development.

S6 The site comprises one large arable field with an additional smaller semi-improved grassland field adjoined to the south-west with potential to be restored to wildflower meadow and/or orchard habitat. The field boundaries are a mixture of mature species-poor hedgerows, with scattered trees, and shrubs bounding residential gardens.

S7 In terms of protected species, surveys have most notably confirmed the presence of an assemblage of foraging/commuting bats of up to district value utilising the hedgerow boundaries. None of the protected species recorded during the course of the field and desk-based studies are considered to pose any in-principle constraints to the development of the site for residential housing. However, appropriate mitigation and working methods will need to be adopted to safeguard breeding bird, bat, reptile and amphibian interests and ensure legal compliance.

S8 Policy for the conservation and enhancement of the natural environment at all levels aims to 'minimise impacts on biodiversity and provide net gains in biodiversity wherever possible' (National Planning Policy Framework (NPPF)paragraph 170). Accordingly, from the outset of the design process, EDP has contributed to the design of the masterplan assessed by this report, which accompanies the planning application.

S9 As a result of this iterative design process, habitat loss has been restricted to the loss of arable habitat, a small amount of boundary vegetation to facilitate access into the site.

Such impacts, including those on associated protected species (principally birds and bats), are proposed to be offset by the creation of new areas of wetland, meadow flower grassland and orchard habitat, in addition to wider tree planting, in order to deliver a net gain in valuable habitat within the Application Site. Furthermore, where possible, retained boundary habitats, and associated species interests, have been buffered from the development footprint and recommendations made for their protection during construction and management during operation, to ensure their long-term viability.

S10 In summary, the ecological mitigation strategy for the scheme includes: (1) avoidance measures already embedded within the illustrative masterplan; (2) measures which should be incorporated at the construction stage; (3) those which should be designed and specified within the landscaping scheme; and (4) management measures to ensure that the design vision is achieved in the long term.

S11 On this basis, EDP considers that the scheme is capable of compliance with relevant planning policy for the conservation of the natural environment at all levels and the scheme is commended to Tewkesbury Borough Council as an ecologically sensitive response to the challenge of accommodating new housing numbers within a greenfield site.

Section 1
Introduction, Purpose and Context

1.1 This Ecological Appraisal has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of L&Q Estates ('the applicant'). It sets out the results of a baseline ecological appraisal of a proposed residential development on approximately 6.28 hectares (ha) of Land off Ashmead Drive, Gotherington, Gloucestershire (hereafter referred to as 'the site'). The site is centred approximately at Ordnance Survey Grid Reference (OSGR) SO 96147 29383 and falls within the administrative boundary of Tewkesbury Borough Council.

1.2 EDP is an independent environmental planning consultancy with offices in Cirencester, Cheltenham, Cardiff and Shrewsbury. The practice provides advice to private and public sector clients throughout the UK in the fields of landscape, ecology, archaeology, cultural heritage, arboriculture, rights of way and masterplanning. Details of the practice can be obtained at our website *www.edp-uk.co.uk.*

Site Context

1.3 The site comprises a large arable field with fairly substantial field margins in the south and north. The field boundaries are a mixture of mature species-poor hedgerows, with scattered trees, and non-native and single species hedges bounding residential gardens. These boundaries provide potential corridors for wildlife across the site, connecting with the wider landscape.

1.4 The northern, eastern and western edges of the site are bounded by residential houses and roads, accessed via Malleson Road, whilst arable fields form the boundary of the southern edge of the site. The wider landscape comprises large areas of arable farmland, with the settlements of Bishop's Cleeve and Cheltenham lying approximately 1.2km and 6km to the south respectively.

Development Proposals

1.5 Outline planning application with means of site access from Ashmead Drive to be determined, (layout, scale, appearance and landscaping reserved for subsequent approval) for the erection of up to 50 dwellings, public open space, earthworks, structural landscaping, car parking, and all other ancillary and enabling works. The Illustrative Site Layout is shown in **Appendix EDP 1**.

1.6 An application was submitted in 2016 for 90 units (16/00901/OUT), which was refused and appealed in 2017 (APP/G1630/W/17/3175559), with the inspector's decision being issued on April 2018. This report accompanies an updated proposal with a reduced scope, allowing for a large area of public open space in the northern area of the site.

Scope of Appraisal

1.7 This Ecological Appraisal sets out the findings of desk-based and field-based investigations of the site. The aims of this report are to:

- Determine the main habitat types within and immediately adjacent to the site in relation to the proposed development footprint;

- Identify any actual or potential habitat/species constraints pertinent to the proposed development of the site, and to identify how the proposed development can avoid, mitigate and, if necessary, compensate for impacts on these actual or potential constraints; and

- Identify potential opportunities for the proposed development to enhance and add to the biodiversity resource within the site in line with the planning policy, including the National Planning Policy Framework (NPPF).

1.8 The remainder of this report is structured as follows:

- **Section 2** describes the methodologies employed in establishing the baseline ecological conditions within and around the site (with further details provided within the Appendices and on the Plans where appropriate);

- **Section 3** summarises the baseline ecological conditions (with further details also provided within Appendices and on Plans where appropriate) and identifies any pertinent ecological features/receptors;

- **Section 4** summarises the key legislative, planning policy and biodiversity action planning considerations for the proposed development and includes key recommendations in line with the aims of the report as set out above; and

- **Section 5** summarises the inherent and recommended additional mitigation measures and provides the overall conclusions of the Appraisal.

Section 2
Methodology (Baseline Investigations)

2.1 This section of the Ecological Appraisal summarises the methodologies employed in determining the baseline ecological conditions within and around the site. The appraisal has been undertaken by appropriately qualified ecologists using relevant best practice methodologies wherever possible. Full details of the techniques and process adopted are, where appropriate, provided within appendices and on plans.

Desk Study

2.2 The desk study is an important element of undertaking an initial ecological appraisal of a site proposed for development, enabling the initial collation and review of contextual information such as designated sites together with known records of protected and priority species.

2.3 The desk study involved collating biodiversity information from the following sources:

- Gloucestershire Centre for Environmental Records (GCER); and
- Multi-Agency Geographic Information for the Countryside (MAGIC) website[1].

The initial desk study was undertaken during September 2015, was updated during September 2019 and involved obtaining the following information:

- International and National statutory designations (10km radius around site);
- National non-statutory local sites (2km);
- Annex II bat species (6km); and
- All other protected/notable species records (1km).

2.4 These search areas are considered sufficient to cover the potential zones of influence[2] of the proposed development in relation to designated sites, habitats and species.

2.5 The results of the desk study are included in **Section 3** of this report and further details are included in **Plan EDP 1**.

[1] www.magic.gov.uk
[2] Zone of Influence - the areas and resources that may be affected by the proposed development

Extended Phase 1 Habitat Survey

2.6 The survey technique adopted for the initial habitat assessment was at a level intermediate between a standard Phase 1 survey technique[3], based on habitat mapping and description, and a Phase 2 survey, based on detailed habitat and species surveys. The survey technique is commonly known as an Extended Phase 1 Habitat survey. This level of survey does not aim to compile a complete floral and faunal inventory for the site.

2.7 The level of survey involves identifying and mapping the principal habitat types and identifying the dominant plant species present in each principal habitat type. In addition, any actual or potential protected species or species of principal importance have been identified. Any readily apparent signs of protected species, such as badger (*Meles meles*), were identified and the potential of habitats to support protected species was evaluated.

2.8 The Extended Phase 1 Habitat Survey of the site, which is detailed further in **Appendix EDP 2**, was undertaken by a suitably experienced surveyor on 18 September 2015 and updated on 23 September 2019. September is considered to be towards the end of the optimal period for undertaking an Extended Phase 1 Habitat survey, but owing to the ecological context and type of habitats present within the site, the survey is considered not to have been limited by seasonal or climatic factors.

Detailed (Phase 2) Surveys

2.9 The scope of Phase 2 Surveys undertaken at the site was defined following the initial studies described above (desk study and Extended Phase 1 Survey). The surveys 'scoped in' are summarised in turn below and a brief explanation of those potential surveys 'scoped out' is provided thereafter.

Bat Surveys

2.10 The scattered trees and hedgerows within the site were considered suitable for foraging and commuting bats. Bat activity was therefore investigated through a combination of manual transect surveys and automated detector surveys during September 2015 and May 2016 comprising 3 dusk transects and 19 nights of automated detector recording.

2.11 In addition, an update transect and static detector survey have been completed during September 2019. A single month of surveys is considered to be a pragmatic level of update survey effort in the context of the historical survey work and limited development impacts to suitable commuting or foraging habitat.

2.12 A single tree within the application site identified as having moderate bat roosting potential during the Extended Phase 1 Habitat survey (TN3 on **Plan EDP 2**) was identified during 2015. This tree was therefore subject to an aerial tree climbing inspection to

[3] Joint Nature Conservation Council (2010) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (reprinted with minor corrections for original Nature Conservancy Council publication)

search for roosting bats by a Natural England bat licensed ecologist in May 2016, but has subsequently been lost to storm damage. The tree was no longer present during the update Extended Phase 1 survey undertaken in September 2019.

2.13 Full details of the bat surveys are provided in **Appendix EDP 3** and on **Plan EDP 3**, **4** and **5**.

Reptile Surveys

2.14 The rough grassland boundaries were considered to be suitable habitat for reptiles. As such, artificial refugia were deployed across the site and checked for reptiles on seven occasions between late September and mid-October 2015. The adjacent field to the south-west was also surveyed, but has subsequently been removed from the proposed development. Full details of the reptile survey are provided in **Appendix EDP 4** and the refugia locations illustrated on **Plan EDP 3**.

2.15 It was not considered to be necessary to update the reptile surveys in 2019 in light of the historic survey findings and due to the more suitable grassland field having been removed from the Site. Suitable habitat is restricted to the arable field boundaries which will largely be protected and buffered from the development proposals.

Surveys Scoped Out

2.16 **Table EDP 2.1** summarises other survey types which, while commonly required as part of an Ecological Appraisal for development sites, were not considered necessary/appropriate in this case.

Table EDP 2.1: Ecology Surveys Scoped Out in 2015

Survey Type	Reasons for Scoping Out
Botanical surveys (grasslands)	Phase 1 survey information was sufficient to confirm habitat value and inform the proposals.
Hedgerow Survey	Phase 1 survey information was sufficient to confirm hedgerow value.
Breeding/wintering birds	Small size of site, limited habitat extents and lack of any nearby nature conservation sites for birds, along with the proposed retention of suitable nesting habitat around the boundaries of the site.
Dormice	No records within 1km, and lack of connectivity between hedgerows on-site and any suitable woodland habitat in the wider landscape.
Badger	Phase 1 survey information and subsequent site visits for reptile and bat surveys were considered sufficient to monitor any badger activity on-site.
Otter, water vole and crayfish surveys	No suitable habitat within the Application Site or within 500m, and no records of water vole and crayfish within 1km.
Great crested newts	Absence of ponds on-site or within immediate proximity. This species does not pose a constraint to the development of arable land.

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Section 3
Results (Baseline Conditions)

3.1 This section of the Ecological Appraisal summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations described in **Section 2**. In particular, this section identifies and evaluates any ecological features/receptors that lie within the site's potential zone of influence and which are pertinent in the context of the proposed development. Further technical details are, where appropriate, provided within appendices and on plans to the rear of this report.

Designated Sites

3.2 Information regarding designated sites was obtained during the desk study from the MAGIC website and from GCER. Statutory designations (those receiving legal protection) and non-statutory designations (those receiving planning policy protection only) are discussed in turn below.

Statutory Designations

3.3 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

3.4 No part of the site is covered by any statutory designations. Two statutorily designated sites lie within 5km; Dixton Wood SAC (which is also a SSSI) to the north-east, and Cleeve Common SSSI to the south-east of the site as detailed in **Table EDP 3.1**. One further SAC, Bredon Hill, lies within 10km of the Site.

Table EDP 3.1: Statutory Designations Within the Site's Potential Zone of Influence

Designation	Distance from Site (approx.)	Interest Feature(s)
Dixon Wood (SAC and SSSI)	2.3km NE	Broadleaved deciduous woodland, designated as a SAC due to presence of scarce invertebrates, including the Annex II listed violet click beetle (*Limoniscus violaceus*).
Bredon Hill (SAC)	9.2km N	Ash wood pasture with veteran trees supporting violet click beetle.
Cleeve Common (SSSI)	3.2km SE	Diverse limestone grassland.

3.5 Due to the size and nature of the site, and its distance from these designated areas, statutory designations are not considered to pose a constraint to development and are not considered any further in this report.

Non-Statutory Designations

3.6 Non-statutory designations are also commonly referred to in planning policies as 'local sites', although in fact these designations are typically considered to be important at a county level. In Gloucestershire, such designations are named *Key Wildlife Sites* (KWSs). Additional designated sites which should be considered at this level include Local Nature Reserves (LNRs) and Ancient Semi-natural Woodland (ASNW), where these are not covered by other designations.

3.7 No part of the site is covered by any KWSs. There are two KWSs and two "unconfirmed" sites within the site's potential zone of influence (in this case considered to be 2km). Unconfirmed sites are sites of potential nature conservation value that are awaiting assessment against the KWS selection criteria. Non-statutory designations are summarised within **Table EDP 3.2**.

Table EDP 3.2: Non-statutory Designations within the Site's Potential Zone of Influence.

Designation	Distance from Site (approx.)	Interest Feature(s)
Buscombe and Gotherington Woods KWS	1.2km NE	Ancient semi-natural broadleaved woodland.
Nottingham Hill Roughs (Unconfirmed site)	1.6km SE	Calcareous grassland.
Nottingham Hill KWS	2km SE	Semi-natural grassland.
Prescott House Woods (Unconfirmed site)	2km NE	Oak/ask woodland over hazel coppice.

Habitats

3.8 Information on habitats within and around the site were obtained during the desk study and the Extended Phase 1 Habitat Survey in September 2015.

Findings of Phase 1 Survey

3.9 The distribution of different habitat types within and adjacent to the site is illustrated on **Plan EDP 2**. In addition, illustrative photographs are provided in **Appendix EDP 2**. A summary and qualitative assessment of these habitats is provided in **Table EDP 3.3**.

Table EDP 3.3: Summary of Habitats within the Site

Habitat or Feature	Distribution Within the Site	Preliminary Assessment of Intrinsic Ecological Value	Potential Value to Protected Species				
			Spp.	Breeding	Foraging	Refuge	Dispersal
Hedgerows (species-poor) and scattered mature trees	All boundaries of field as well as north-western and south-eastern site boundaries	**Local** – owing to limited botanical diversity, but still potential to provide some habitat for protected/notable species.	Birds	✓	✓	✓	
			Bats		✓		
			Badger		✓		✓
			Amphibians		✓	✓	✓
			Reptiles	✓	✓	✓	✓
Arable field	Majority of the site	**Site/Negligible** – limited to occasional foraging opportunities for some protected species.	Birds	✓	✓		
			Bats		✓		
			Badger		✓		✓

3.10 As noted in **Table EDP 3.3**, the majority of land cover within the site is arable farmland of low ecological value.

3.11 The site boundaries are also predominantly of relatively low value owing to their limited botanical diversity, but provide potentially valuable corridors for wildlife and have the potential for enhancement to deliver a net increase in biodiversity.

Protected and/or Notable Species

3.12 The likelihood of presence, or confirmed presence, of protected/and or notable wildlife species within the site is summarised below with reference to desk study records, habitat suitability and detailed surveys where relevant. Further details are made available within appendices and plans where referenced.

3.13 Where a particular species or taxonomic group has been confirmed to be present, or presence is inferred based on habitat suitability, the ecological value or significance of the population or assemblage is assessed on a geographical scale.

3.14 Only a small number of protected and locally notable species have been recorded within 1km of the site. This is potentially a result of the paucity of recorders, and as such species may therefore still be present in the site's vicinity and have gone unrecorded.

Breeding/Wintering Birds

3.15 Bird records returned by GCER from within the Gotherington village area included red

listed species of conservation concern[4] that could potentially utilise the habitat on and around the site for nesting and foraging. Such species included tree sparrow (*Passer montanus*), house sparrow (*Passer domesticus*), song thrush (*Turdus philomelos*) and starling (*Sturnus vulgaris*). Red listed winter migrants included fieldfare (*Turdus pilaris*) and redwing (*Turdus iliacus*). Records for Schedule 1 species barn owl (*Tyto alba*) were also returned.

3.16 A number of birds were recorded 'incidentally' during the course of 2015's surveys, including red listed species yellowhammer (*Emberiza citrinella*) and skylark (*Alauda arvensis*). Due to the disturbance from dog-walkers using the public footpaths that cross the field, it is not considered that this field would provide particularly suitable habitat for ground nesting species like skylark (which were observed in small autumn flocks moving over the site and the wider landscape). Redwing and fieldfare were recorded in small numbers foraging on the blackthorn berries on the western boundary of the site in October 2015.

3.17 The site is not considered to contain a large enough amount of suitable habitat to support any notable bird assemblages. The hedgerows provide potential habitat for nesting and foraging birds, however, only a small section of the hedgerow network in the site is due to be impacted by the proposals. In light of the above, the small size of the site, the low potential of the arable field to support ground nesting species, and the nature of the development proposals, precautionary mitigation detailed under **Section 4** is considered to be adequate to negate the need for any bird surveys to be undertaken to inform the proposals, and to safeguard any breeding birds using the site's hedgerows.

Bats

3.18 GCER returned records of six different bat species within the 1km search area, including serotine (*Eptesicus serotinus*), noctule (*Nyctalus noctula*), Myotis (species unspecified), brown long-eared (*Plecotis auritus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and common pipistrelle (*Pipistrellus pipistrellus*). This included Myotis and pipistrelle roosts at Moat Farm (around 200m north of the site). Additionally, within the 6km search radius for Annex II species, many records for lesser horseshoe (*Rhinolophus hipposideros)* and a single record for greater horseshoe *(R. ferrumequinum*) roosts. These were mostly from the neighbouring villages of Alderton, Woolstone and Woodmancote, although a few located within Gotherington, including lesser horseshoe roosts at Moat Farm, roughly 150m to the north of the Site.

3.19 Detailed results from the four dusk transect surveys and the automated detector surveys undertaken in 2015, 2016 and 2019 are provided in **Appendix EDP 3**, and the distribution of bat activity recorded around the site during the transect surveys is illustrated on **Plan EDP 4** and **5**.

[4] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R..D., Lock, L.., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R..D. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds, Vol. 108, 708-746

3.20 In summary, low-moderate levels of bat activity from at least seven common and widespread species were recorded across the site, in addition to a notable amount of foraging activity by barbastelle bats (*Barbastella barbastellus*), particularly in September 2015 (34.9% of calls), and some lower levels from lesser horseshoe bats (*Rhinolophus hipposideros)*. Both of these species are listed on Annex II on the European Habitats Directive and are species of principle importance in the UK.

3.21 The barbastelle calls were most frequently recorded on the Anabat in the south-east of the Site in September 2015 (see **Plan EDP 3** – AEX 1 (2015)). On most nights the first calls were around sunset, and recordings continued until around midnight. Barbastelle bats are thought to predominantly roost in tree crevices, but have also been known to use buildings, and the species is known to frequently emerge from roosting early in the evening (often while still light)[5]. Juveniles are known to follow adults from maternity roosts in late summer to favoured hunting areas[6]. Due to the proximity of the first recordings to sunset, it is considered likely that there is a roost within a relatively short flying distance of the site's southern hedgerow.

3.22 While barbastelle activity was also recorded by the Anabat near to this location in May 2016, the number of passes was far fewer suggesting that there may be some seasonal change in foraging/commuting activity of barbastelle bats in the local area. There was also a notable increase in noctule bat activity in May 2016, again suggesting some seasonal variation in foraging/commuting over the site.

3.23 Overall, bat activity was higher in September 2019, despite the fact that habitats had not changed in quality since the 2015 surveys. Although the number of calls had increased, the relative proportions of each species was relatively consistent. Common pipistrelle make up the majority of the calls recorded (64.8% of calls), whereas barbastelle make up 12.9% of calls recorded, and lesser horseshoe 3%. No new species were recorded. These species were present in higher numbers at the equivalent time of year during 2015, and the apparent increase in activity is considered to be due to seasonal variation in foraging/commuting over the site and prevalent weather conditions.

3.24 The majority of the trees within the site's hedgerow system assessed during the Extended Phase 1 habitat survey were considered unlikely to support significant bat roosting potential due to their immaturity and lack of features accessible to bats, such as woodpecker holes and tears.

3.25 It is anticipated that the majority of the trees on-site, which are restricted to the boundaries, will be retained by the development proposals. Although a small number of hedgerow shrubs will be lost to enable access into the site, no mature trees with bat roost potential will be lost. A single tree, T24, was present in the middle of the field, but has fallen and been removed since the initial surveys in 2015 and 2016. Given its bat roosting potential, this tree was subject to an aerial tree climbing inspection in May 2016, as detailed in **Appendix EDP 3**. No evidence of roosting bats was found and only a

[5] http://www.bio.bris.ac.uk/research/bats/britishbats/index.htm
[6] http://www.bats.org.uk/pages/barbastelle-1.html & the BCT's associated barbastelle bat fact sheet

single moderate potential roost feature identified – a woodpecker hole containing a disused bird nest.

3.26 Based on the findings summarised above (and detailed in **Appendix EDP 3**), and owing to the usage of the site by Annex II-listed bats (lesser horseshoe and barbastelle) with a relatively high amount of barbastelle activity recorded late in the season, the bat population present utilising the sites boundary features is considered to be of district level value.

Badger

3.27 The data search returned no records of badger within 1km of the site. Badger activity was noted during the Phase 1 Survey in the field adjacent to the south-west. Trails and latrines were present in the adjacent field, but no sett was recorded here or within the Site itself. It is probable that there is a sett in relatively close proximity to the site given the level of activity recorded.

Great Crested Newt

3.28 The GCER data search returned a number of records of great crested newt (*Triturus cristatus*) from within 1km of the site, the closest of which comes from under 150m to the north-west in 2004 (when nine were recorded in a garden pond). Records also exist from garden ponds to the west of common toad (*Bufo bufo*), smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*).

3.29 There is no suitable breeding habitat in the site. A garden pond (in which great crested newts have been recorded) exists approximately 150m west of the north-western corner of the Site beyond an area of residential dwellings and a former semi-improved grassland field which has since been developed. There are a number of waterbodies within the wider landscape, including one within 180m of the south-eastern boundary (as well as a ditch and pond around 140m south of that), and two within 250m of the northern boundary (at 170m and 240m respectively, and separated from the site by the village of Gotherington itself).

3.30 Suitable terrestrial habitat for great crested newts (and other amphibians) on site exists within the field boundaries of the Site, which in places contain long grasses, garden walls and compost heaps. Given the extent of intensively managed arable land to the south, however, this habitat is considered sub-optimal.

3.31 Due to the development footprint of the site being predominantly limited to the interior of the arable field and the buffering and improvement works proposed for the hedgerow network, great crested newts are not considered to pose a constraint to the proposed development and further surveys were not considered necessary. The precautionary mitigation[7] detailed under **Section 4** of this report (which is also particularly relevant for reptiles) is considered suitable to protect great crested newt interests as well as any of

[7] Great crested newt mitigation guidelines, English Nature August 2001

the common amphibian species that may forage or disperse utilising the Site's hedgerow network.

Reptiles

3.32 A number of recent reptile records pertinent to the site (from GCER and documents on Gotherington village and its surroundings) were located during the desk study. Slow-worm (*Anguis fragilis*) and grass snake (*Natrix natrix*) records exist from in and around Gotherington (Gotherington Village Design Statement[8]) with other records showing slow worm sightings from Gotherington village (in the residential gardens just east of the site boundary) and grass snakes in Bishop's Cleeve (around 1km south). Recent records from the GCER data search also included grass snakes from gardens in Bishop's Cleeve, as well as additional records in Woodmancote.

3.33 No reptiles were recorded during the 2015 surveys. The majority of the site generally has low potential to support reptiles. However, the margins of the arable field (long grasses, scrubby areas and garden edges including compost heaps) do provide suitable habitat for grass snake, slow-worm and common lizard.

3.34 The reptile surveys are considered to have been seasonally constrained due to the surveys taking place towards the end of the optimal survey period (early October). However, reptiles are not considered to pose a constraint to the proposed development; the habitats of greatest potential to support reptiles are anticipated to be retained (around the margins of the field) and their presence has been assumed in order to guide precautionary mitigation measures that safeguard reptile and amphibian interests, as detailed in **Section 4**.

Other Species

3.35 The desk study did not return any other notable records from the site's vicinity, but it is considered that the rough grassland margins are a potential refuge and suitable habitat for species not recorded by GCER or by the survey work undertaken on-site (such as invertebrate species and hedgehogs).

Summary of Key Issues Arising from Survey Findings

3.36 The key issues arising from survey findings is summarised below:

- Mature hedgerows and boundary vegetation that provide corridors for wildlife, most notably a relatively valuable assemblage of bats including the relatively rare species barbastelle and lesser horseshoe; and

- Potential for the boundaries of the field to provide terrestrial habitat for amphibians and reptile species.

[8] Tewkesbury Borough Council; Gotherington Village Design Statement

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Section 4
Discussion and Recommendations

4.1 This section discusses the baseline conditions set out in **Section 3** in the context of legislative and planning policy considerations, and makes recommendations with respect to the development proposals.

4.2 In accordance with the *Natural Environment and Rural Communities (NERC) Act* 2006, within England, local planning authorities have a statutory duty to have regard to effects upon biodiversity when exercising their functions; this includes consideration of effects upon ecological features such as designated sites, and Priority Habitats/Priority Species when determining planning applications. In accordance with planning policy at all levels, local planning authorities must also consider whether or not 'significant harm' to biodiversity may occur due to effects upon such ecological features. This, and the statutory protection afforded to certain designated sites and species, is explored in further detail below.

Details of the Proposed Development

4.3 Outline planning application with means of site access from Ashmead Drive to be determined, (layout, scale, appearance and landscaping reserved for subsequent approval) for the erection of up to 50 dwellings, public open space, earthworks, structural landscaping, car parking, and all other ancillary and enabling works. The illustrative site layout for the application is shown in **Appendix EDP 1** and further details on the design and layout are provided within the Design and Access Statement (DAS) accompanying the application.

4.4 EDP has provided inputs throughout the iterative design process so the masterplan, although illustrative, already reflects some important measures, suggested by EDP, to avoid, mitigate or compensate for ecological impacts as well as other measures designed to provide long-term ecological enhancements. The development footprint almost entirely occupies the arable land of negligible ecological value, with the boundary trees and hedgerows, of higher ecological value, retained. Habitat losses have therefore primarily been restricted to the arable habitat and small-scale tree and hedgerow loss to facilitate access into the site.

4.5 The proposals will also include the creation of attenuation features, with permanent water elements, tree planting and wildflower grassland within areas of open space, that will assist in delivering a net gain in biodiversity.

4.6 A vision for the open spaces and natural areas incorporated as part of the masterplan proposals is contained within the Illustrative Landscape Masterplan. Further measures designed to ensure that the proposal '*minimises impacts on biodiversity and provides net gains in biodiversity*' in accordance with paragraph 170 of National Planning Policy

Framework (NPPF), may be incorporated at the reserved matters stages. Such measures are discussed further below.

Designated Sites

4.7 As detailed under **Section 3** there are no statutory designations that are pertinent to the development proposals.

4.8 Non-statutory designations/local sites do not receive any formal legal protection. However, they do receive planning policy protection, as reflected in the NPPF and protection at a local level under saved Policy SD9 of the Joint Core Strategy 2011-2031, adopted 2017, which states that:

"1. The biodiversity and geological resource of the JCS area will be protected and enhanced in order to establish and reinforce ecological networks that are resilient to current and future pressures. Improved community access will be encouraged so far as is compatible with the conservation of special features and interests

This will be achieved by:

…

ii. Conserving and enhancing biodiversity and geodiversity on internationally, nationally and locally designated sites, and other assets of demonstrable value where these make a contribution to the wider network, thus ensuring that new development both within and surrounding such sites has no unacceptable adverse impacts;

…"

4.9 As described in **Section 3**, there are four non-statutory designations within 2km of the site two KWSs and two "undetermined" KWSs (which are recommended to be treated as though designated as KWSs until otherwise decided). All of these non-statutory designations are considered to be sufficiently segregated from the site, by virtue of their conservation interests and location (>1km) relative to the small size of the site and its habitat/protected species interests, for there not to be any significant direct or indirect adverse impacts from the development proposals. Thus, no additional mitigation measures are considered to be necessary.

Habitats

4.10 There are several mechanisms through which habitats receive protection outwith the statutory and non-statutory designated site frameworks. For instance, certain habitats are identified in policies within the NPPF. Furthermore, the NPPF states:

"*174. To protect and enhance biodiversity and geodiversity, plans should:*

a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and

b) Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

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

a) If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons58 and a suitable compensation strategy exists; and

d) *Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*"

4.11 At the local level, the Joint Core Strategy (JCS) was adopted by Tewkesbury Borough Council on 05 December 2017. The policies contained within the JCS guide development across the Boroughs of Cheltenham, Tewkesbury and Gloucester City. Policies SD9 and INF3 of the JCS echo the principles of the NPPF and include Policy SD9: Biodiversity and Geodiversity, which concerns protected species, habitats and designated sites. It states:

1. *"The biodiversity and geological resource of the JCS area will be protected and enhanced in order to establish and reinforce ecological networks that are resilient to current and*

future pressures. Improved community access will be encouraged so far as is compatible with the conservation of special features and interests.

2. This will be achieved by:

i. Ensuring that European Protected Species and National Protected Species are safeguarded in accordance with the law;

ii. Conserving and enhancing biodiversity and geodiversity on internationally, nationally and locally designated sites, and other assets of demonstrable value where these make a contribution to the wider network, thus ensuring that new development both within and surrounding such sites has no unacceptable adverse impacts;

iii. Encouraging new development to contribute positively to biodiversity and geodiversity whilst linking with wider networks of green infrastructure. For example, by incorporating habitat features into the design to assist in the creation and enhancement of wildlife corridors and ecological stepping stones between sites; and

iv. Encouraging the creation, restoration and beneficial management of priority landscapes, priority habitats and populations of priority species. For example, by securing improvements to Strategic Nature Areas (as set out on the Gloucestershire Nature Map) and Nature Improvement Areas.

3. Any development that has the potential to have a likely significant effect on an international site will be subject to a Habitats Regulations Assessment;

4. Within nationally designated sites, development will not be permitted unless it is necessary for appropriate on-site management measures, and proposals can demonstrate that there will be no adverse impacts on the notified special interest features of the site;

5. Development within locally-designated sites will not be permitted where it would have an adverse impact on the registered interest features or criteria for which the site was listed, and harm cannot be avoided or satisfactorily mitigated; and

6. Harm to the biodiversity or geodiversity of an undesignated site or asset should be avoided where possible. Where there is a risk of harm as a consequence of development, this should be mitigated by integrating enhancements into the scheme that are appropriate to the location and satisfactory to the Local Planning Authority. If harm cannot be mitigated on-site then, exceptionally, compensatory enhancements off-site may be acceptable."

4.12 Policy INF3: Green infrastructure states;

"1. The green infrastructure network of local and strategic importance will be

conserved and enhanced, in order to deliver a series of multifunctional, linked green corridors across the JCS area by:

i. Improving the quantity and/or quality of assets;

ii. Improving linkages between assets in a manner appropriate to the scale of development, and

iii. Designing improvements in a way that supports the cohesive management of green infrastructure.

2. Development proposals should consider and contribute positively towards green infrastructure, including the wider landscape context and strategic corridors between major assets and populations. Where new residential development will create, or add to, a need for publicly accessible green space or outdoor space for sports and recreation, this will be fully met in accordance with Policy INF4. Development at Strategic Allocations will be required to deliver connectivity through the site, linking urban areas with the wider rural hinterland;

3. Existing green infrastructure will be protected in a manner that reflects its contribution to ecosystem services (including biodiversity, landscape/townscape quality, the historic environment, public access, recreation and play) and the connectivity of the green infrastructure network. Development proposals that will have an impact on woodlands, hedges and trees will need to include a justification for why this impact cannot be avoided and should incorporate measures acceptable to the Local Planning Authority to mitigate the loss. Mitigation should be provided on-site or, where this is not possible, in the immediate environs of the site; and

4. Where assets are created, retained or replaced within a scheme, they should be properly integrated into the design and contribute to local character and distinctiveness. Proposals should also make provisions for future maintenance of green infrastructure."

4.13 In addition, the Tewkesbury Borough Local Plan to 2011 (adopted March 2006) includes saved policies that echoes the principles of the NPPF and the JCS, including Policies NCN 5 to NCN 7, which state that habitats of high ecological value should be protected and enhanced wherever possible.

4.14 Furthermore, planning authorities in England have a duty to have regard to UK Habitats of Principal Importance[9], under Section 40 of the *Natural Environment and Rural Communities (NERC) Act* 2006.

[9] Priority Habitats are those 24 habitats listed on the Priority Habitat Inventory (PHI) as defined by Natural England in 2013 and as published in the Biodiversity Strategy for England (Biodiversity 2020) - see: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382483/2a._priority_habitats2a_2014_final.pdf

4.15 Habitats within the site and along the site boundaries have been assessed through an Extended Phase 1 Habitat survey. The vast majority of the site is arable land, and considered to be of negligible ecological value. The most valuable habitats present are the hedgerow network (hedgerows on lowland farmland are listed as Priority Habitats in Gloucestershire), and the rank, marginal boundaries.

4.16 All semi-natural boundary habitats have been retained within the Illustrative Site Layout, and buffered, with losses restricted to the arable habitat and some minor hedgerow/scrub removal to facilitate access into the site. As such no significant habitat impacts are anticipated to arise as a result of the development proposals.

4.17 Furthermore, the development proposals include the creation of two attenuation features within the south-west corner of the site, which will include permanent water and be designed to enhance opportunities for wildlife. Wildflower grassland and structural planting will also be created around these attenuation features and within areas of green space around the site's perimeter, particularly along the southern boundary.

4.18 To avoid damage/disturbance of retained features during construction, it is recommended that Ecological Protection Zones (EPZs) with an appropriate buffer should be established during the construction phase. EPZs can often be achieved through co-ordination with tree protection measures required as good arboricultural practice (see EDP Arboricultural Assessment), including temporary protective fencing and signage. It is recommended that details of such measures and their implementation are delivered through an Ecological Construction Method Statement (ECMS) secured by a suitably worded planning condition.

4.19 It is recommended that specifications for new planting and other habitat creation should be provided within a detailed Soft Landscaping Scheme, secured by planning condition. In addition, it is recommended that measures to restore and enhance existing habitats, to ensure successful establishment of new habitats, and to maintain the value of all ecological features in the long-term are detailed within an Ecological Management Plan (EMP) secured by planning condition

4.20 Subject to the recommendations outlined above being implemented, the development proposals would be in line with planning policies and national and local action plans relating to habitats.

4.21 Some habitats within the site that, despite being of little/no inherent ecological value, need to be considered with regard to their potential to support protected/notable species. This is discussed within the species-specific sections below.

Protected and/or Notable Species

4.22 Certain species receive legal protection in the United Kingdom and are commonly known as 'protected species'. In reality, the level of protection for different species varies considerably, from protection solely against 'killing and injury' to full protection of the

species and their places of refuge. Where pertinent, details of legal protection afforded to species/species-groups are provided below.

4.23 In addition to protected species, there are other species/species-groups that do not receive legal protection, but which are notable owing to their conservation status such as UK Priority Species and local Biodiversity Action Plan species. Local authorities are required to give due regard to the conservation status of species under the *NERC Act* 2006.

4.24 With respect to planning policy, protected and notable species are afforded policy protection at a national level by the NPPF (such as paragraph 170) and at a local level as a surrogate through Saved Policy SD9 detailed under Habitats above.

4.25 Baseline investigations have identified potential protected species implications for the development relating to birds, bats, badgers, amphibians, and reptiles.

Breeding/Wintering Birds

4.26 All wild birds, their nests and eggs are protected under Section 1 of the *Wildlife and Countryside Act* 1981 (as amended), with certain species afforded additional protection measures. In addition, certain conservation concern species are listed as UK Priority Species.

4.27 It is not considered that the proposed development will have any significant impact on the local bird populations given that the habitats of greatest potential value to foraging and nesting birds are limited in extent and will be retained by the proposals. Although the arable habitat will be lost, which could provide nesting habitat for open ground nesting birds such as skylark, such species are considered to be extremely unlikely to be present given the level of disturbance from local dog walkers and the proximity of boundary hedgerows and residential property. Furthermore, the wider landscape surrounding the site contains an abundance of similar arable habitat into which any such species could be displaced.

4.28 However, given the protection afforded to all breeding birds, their nests, eggs and young, it is recommended that the removal of any boundary vegetation is preceded by a check for nesting birds by a suitably qualified ecologist to confirm that no active nests are present. If evidence of nesting is recorded, works within that particular area shall not proceed until the chicks have fledged, with a buffer zone around the active nest of 5m.

4.29 Furthermore, nesting opportunities could be increased through the provision of artificial bird boxes within the retained habitat or on the new buildings. Such measures could be secured by a suitably worded pre-commencement planning condition. Subject to these recommendations being fulfilled no significant impacts upon birds are anticipated.

Bats

4.30 All species of British bat are listed as a European Protected Species (EPS) on Schedule 2

of the Conservation Regulations (Annex IV (a) to the Habitats Directive). This affords bats and their roosts strict protection under the *Conservation of Habitats and Species Regulations 2017* (as amended). Additional protection for bats is also afforded under the *Wildlife and Countryside Act 1981* and a subset of the British bat assemblage are listed as species of principle importance in the UK.

Roosting Bats

4.31 One of the mature trees within the site was identified as having bat roosting potential during the initial Extended Phase 1 Habitat survey (T24) and subject to an aerial tree climbing inspection. No evidence of roosting bats was recorded and the tree was subsequently lost during a storm and need not be considered further. During the Extended Phase 1 Habitat survey none of the boundary trees appeared to have features suitable for roosting bats, and it is understood that all of the trees on-site will be retained *in situ*.

4.32 Removal of trees or limbs containing bat roosts would require a Natural England EPS licence to be obtained in advance and suitable alternative roosting habitat provided (typically in the form of bat boxes). It is considered that, in the event that a bat roost is discovered within a tree requiring removal, there is sufficient opportunity within the development to provide the necessary mitigation to ensure the favourable conservation status of the local bat population is maintained.

4.33 Notwithstanding the legal requirement to provide replacement roosting habitat where existing roosts are being removed, it is recommended that bat roosting opportunities are increased as a result of the development, through the incorporation of features such as access tiles, gaps under fascia boards or bat bricks into selected new dwellings situated in closest proximity to suitable foraging habitats. Additionally, given the regular usage of the site by the Annex II listed barbastelle, bat boxes suitable for this species (crevice bat boxes) should be installed upon retained mature trees. Details should be agreed at the detailed design/reserved matters stages and included in the EMP for the development.

Commuting and Foraging Bats

4.34 The assemblage of bats recorded foraging and/or commuting within the site, with the exception of the large number of barbastelle records in September 2015 and 2019, is not considered to be unusual for the locality and habitats present. Due mostly to the amount of barbastelle recordings, especially from the static detectors along the southern boundary of the site, the bat population within the site is considered to be of up to district value.

4.35 The majority of habitats found to support bat activity have been retained and buffered by the illustrative site layout, particularly the western and southern boundary hedgerows/trees where bat activity was at its highest (relatively speaking). The retention, buffering, and strengthening of the southern boundary where barbastelle and horseshoe activity were at their greatest is considered to be an integral feature of the precautionary mitigation for protected species' interests on the site. Such inherent mitigation will help

to maintain the boundary corridors as valuable commuting and foraging routes for the bat population. Furthermore, the proposed creation of new attenuation features, wildflower grassland and structural planting, in addition to strengthening of boundary habitats will help to enhance on-site foraging and commuting opportunities for bats.

4.36 The retained and newly created habitats within the development could be subjected to increased light levels after sunset, which would deter foraging bats, particularly barbastelle and horseshoe bats (species known to be averse to artificial light). It is therefore recommended that, at the detailed design/reserved matters stage, a wildlife-sensitive lighting scheme should be devised to avoid or minimise light spill where development is located in close proximity to retained foraging habitats. This could be achieved through a combination of positioning of fittings/luminaires and other design features such as directional hoods/baffles, timers, low level bollards etc. to maintain 'dark zones' in key locations such as along the sites southern boundary.

4.37 Given the village edge locality, and subject to the above measures being implemented, it is considered that adverse impacts on the bat population will be avoided and new opportunities can be created.

Badger

4.38 Badgers and their setts receive protection under the *Protection of Badgers Act* 1992, which protects badgers from deliberate harm and injury. The protection afforded to badgers is primarily due to animal welfare issues and not due to concern over their unfavourable nature conservation status.

4.39 Badger signs were recorded to the south-west of the site and are known to be present within the wider landscape. Owing to the species mobile nature it is therefore recommended that prior to the commencement of development, a site walkover survey is undertaken to search for any active setts.

Great Crested Newt

4.40 Great crested newt is a European Protected Species, listed under Annex II of the *Conservation of Habitats and Species Regulations* (2017) and subject to the same legal protection as that detailed above in respect of bats.

4.41 There are no waterbodies on-site suitable for great crested newts breeding. The closest known waterbody is a garden pond containing great crested newt records approximately 150m west of the north-western corner of the site beyond a large area of residential dwellings. Suitable terrestrial habitat on-site is restricted to the rank grassland and hedgerows around the field boundaries. These areas are proposed to be retained and buffered as part of the development proposals, with the development footprint being restricted to the centre of the arable field. As such, it is therefore not considered that any infringement of the Habitats Regulations would occur, nor is it necessary to obtain a Natural England EPS derogation licence for the development, provided the precautionary

recommendations made to safeguard reptile interests, and more generally detailed in **Table EDP 4.1** for all protected species, are followed.

Reptiles

4.42 All species of reptile (including common lizard, slow-worm, grass snake and adder) receive at least limited protection from harm under the *Wildlife and Countryside Act* (1981, as amended) and it is an offence to cause the intentional killing and injuring of these species. In addition, these species are also listed as UK Priority Species, highlighting them as species of conservation concern.

4.43 It is largely only the grass margins of the site which provides opportunities for reptiles. Given the recent reptile records returned from the vicinity, particularly from the adjacent gardens to the west, the presence of at least small numbers of grass snake and/or slow-worm is assumed in this area of the site (despite the lack of records during the late-season surveys in 2015).

4.44 It is anticipated that the boundary vegetation will be retained as part of the development proposals. However, it is recommended that if any grassland or hedgerow removal is required during construction a precautionary approach is taken (as provided below) due to the potential for this habitat to support reptiles (and amphibians). It is recommended that grass/ruderal margins are cleared through phased cuts towards retained habitats during the active reptile season (April to September) to allow reptiles (and amphibians) to disperse/escape into retained habitats. Such clearance may need to be supervised by a suitably experienced ecologist. Any stones and natural refugia should be hand searched for reptiles and amphibians, and then cleared to make the area unsuitable as a refuge for the remainder of the construction period (see **Table EDP 4.1** for further mitigation measures relating to herpetofauna and other protected species present/potentially present on the site).

4.45 It is recommended that reptile hibernacula are created from rubble and brash piles within retained and created habitats on-site such as part of the enhancement within areas of green space along the site's southern and northern boundaries. As the majority of the site is currently of low potential for reptiles, and there are reptile records from nearby suitable areas within the village, the creation of some small open areas of rough grassland on the site's boundaries could be of benefit to the local reptile population, and could potentially increase the biodiversity value of the site.

Summary of Predicted Ecological Impacts and Principle Mitigation Measures

4.46 The potential impacts on valued ecological features (accounting for inherent mitigation), and recommended additional mitigation measures in line with legislative and planning policy requirements, are summarised in **Table EDP 4.1**.

Table EDP 4.1: Summary of Ecological Impacts and Mitigation

Feature	Inherent Mitigation	Potential Impacts	Additional Mitigation and/or Enhancement
Hedgerows and field margins	Retention and buffering	Loss and damage during construction and degradation post-development	Protection during construction; habitat enhancement (e.g. gap planting), creation, restoration and management.
Species (birds, bats, badgers reptiles & amphibians)	Habitat retention and buffering	Harm/disturbance and habitat loss during construction and post-development	1) Protection measures during construction, including ecological supervision where required; 2) Habitat creation, restoration and management (including strengthening of southern and northern boundaries); and 3) Post-development management of habitat corridors and sensitive lighting scheme.

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Section 5
Summary and Conclusions

5.1 This section of the Ecological Appraisal summarises the Ecology Strategy for the proposed development, in terms of inherent and recommended additional mitigation measures, and then provides the overall conclusions of the Appraisal.

Summary of Ecology Strategy

Inherent Mitigation Embedded in the Illustrative Masterplan

5.2 The following mitigation is embedded in an illustrative masterplan:

- Retention and buffering of boundary hedgerow and tree habitat.

5.3 It is recommended that the following design principles are translated into the detailed layout at the Reserved Matters stages, with further details relating to construction, detailed design and management secured by condition as set out below.

Construction Measures

5.4 Construction measures include:

- Briefing of site personnel and supervision of certain construction/enabling works by a suitably experienced ecologist;

- Protection of retained habitats within EPZs where construction personnel, vehicles and materials are excluded;

- Pre-commencement survey for badger setts and appropriate exclusion measures if required; and

- Sensitive timing and methods of vegetation clearance with particular regard to nesting birds, amphibians and reptiles.

5.5 It is recommended that these measures are detailed with an Ecological Construction Method Statement (ECMS) secured by a suitably worded pre-commencement condition attached to the planning consent.

Detailed Design Measures

5.6 Detailed design measures to be incorporated into the developing masterplan include:

- New native tree/shrub/hedgerow planting to strengthen existing green corridors (notably along the southern boundary hedgerow) and enhance/create grassland habitats within Public Open Space in the north of the site;

- New permanent water features within SuDS provision;

- Clear demarcation of public rights of way to minimise recreational impacts within newly created and retained habitats, including new wildflower grassland and ponds;

- Bird boxes erected on suitable mature trees;

- Bat roosting features incorporated into selected new dwellings and/or erected on boundary trees; and

- Wildlife-sensitive lighting scheme with particular regard to bats along the southern boundary.

5.7 It is recommended that these measures are incorporated into the Soft Landscaping scheme, Ecological Management Plan (EMP) or lighting design, secured by a suitably worded pre-commencement condition attached to the planning consent.

Restoration, Enhancement and Maintenance Measures

5.8 Recommended restoration, enhancement and maintenance measures include:

- Mowing and weed control in seeded grassland areas within first year around boundaries and public open space post-development to aid establishment;

- Trimming of hedgerows, with selected hedgerows in informal open spaces cut on a 3-year rotation (with no more than one third cut any one year) to increase value to wildlife; and

- Long-term annual hay-cut of the new wildflower grassland to promote botanical diversity.

5.9 It is recommended that these measures are detailed within an Ecological Management Plan (EMP) secured by a suitably worded pre-commencement condition attached to planning consent.

Overall Conclusions

5.10 EDP's desk and field-based baseline investigations have demonstrated that the designated sites, habitats and species present within and around the site do not pose an 'in principle' constraint to the proposed development which is the subject of this Appraisal. There are no statutorily protected nature conservation interests within the

proposed development site and none nearby that would be materially affected by the proposals.

5.11 However, not unexpectedly for an edge of settlement site of this size, EDP's surveys have identified a small number of habitat features and protected species that will need to be respected and embedded into any future reserved matters applications.

5.12 Specific proposals for the avoidance, mitigation and compensation of any predicted impacts are considered in this report and summarised above. These measures include: (1) those that should be embedded within the illustrative masterplan; (2) measures which should be incorporated at the construction stage; (3) those which should be designed and specified within the landscaping scheme; and (4) management measures to ensure that the design vision is achieved in the long term.

5.13 On this basis, EDP considers that the scheme is capable of compliance with relevant planning policy for the conservation of the natural environment at all levels and the scheme is commended to Tewkesbury Borough Council as an ecologically sensitive response to the challenge of accommodating new housing numbers within a greenfield site.

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Appendix EDP 1
Illustrative Site Layout

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Appendix EDP 2
Habitat Descriptions, Target Notes and Site Photographs

A2.1 The principal habitats within the site are described below, with illustrative photographs provided where appropriate. The following should be read in conjunction with **Plan EDP 1** appended to this report.

Arable

A2.2 The majority of the site comprises a large arable field (see **Image EDP A2.1**) dissected by a Public Right of Way (PRoW) The marginal vegetation is dominated by perennial ryegrass (*Lolium perenne*), cock's-foot (*Dactylis glomerata*) and common couch grass (*Elymus repens*), with forbs such as meadow cranesbill (*Geranium pratense*) and field speedwell (*Veronica persica*) also frequent. Hedge mustard (*Sisymbrium officinale*), shepherd's purse (*Capsella bursa-pastoris*), common chickweed (*Stellaria media*), knotgrass (*Polygonum aviculare*), creeping thistle (*Cirsium arvense*), white dead-nettle (*Lamium album*), nettle (*Urtica dioica*) and bladder campion (*Silene vulgaris*) and white campion (*Silene latifolia*) are all commonly found throughout these verges.

A2.3 A small area of scattered scrub exists on the eastern edge of the field, formed mostly of non-native species, including bamboo (sp. Unknown), laurel (*Prunus laurocerasus*) and horse chestnut (*Aesculus hippocastanum*), as well as walnut (*Juglans regia*), oak (*Quercus robur)* and ash (*Fraxinus excelsior*).

Hedgerows with Scattered Trees

A2.4 The majority of the southern and western boundaries of the site are made up of hedgerows with scattered trees. These margins are dominated by hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), and ash. Rowan (*Sorbus aucuparia*), oak), willow (*Salix* sp.), walnut and horse-chestnut are also present throughout these areas, particularly along the southern boundary.

Image EDP A2.1: View looking west in F1 from the north-eastern corner of the site.

Image EDP A2.2: The eastern boundary (TN2) of F1 showing garden walls and compost pile (potential habitat for reptiles).

Image EDP A2.3: South-eastern hedgerow boundary.

Phase 1 Habitat Plan Target Notes

A2.5 The following target notes are illustrated on **Plan EDP 2**:

- **TN1:** Garden arisings/compost in defunct hedgerow area (reptile potential);
- **TN2:** As TN1; and
- **TN3:** Former position of ash tree with bat potential.

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Appendix EDP 3
Bat Surveys

Methodology

A3.1 During the Extended Phase 1 Habitat survey, areas of semi-improved grassland, scattered trees and hedgerows were identified as having the potential to support foraging and commuting bats. Mature trees within the site were also identified as being potentially suitable for roosting bats.

A3.2 The following surveys for bats were therefore undertaken, with reference to national best practice guidelines at the time[10]:

1. Bat foraging/commuting activity, comprising:
    (a) Manual transect surveys; and
    (b) Automated detector surveys.
2. Assessment of mature trees for bat roosting potential, comprising:
    (a) Visual assessment; and
    (b) Aerial inspection.

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

A3.3 Two manual transect surveys were undertaken across the site to identify areas of bat foraging activity and commuting routes used by bats during September 2015, one in May 2016 and one in September 2019, with reference to current best practice guidelines.

A3.4 Full details including the survey type, date, timing, and weather conditions during all four transect surveys undertaken between 2015 and 2019 are given in **Table EDP A3.1**. Weather conditions on each visit were optimal for bat surveys, being relatively warm with light to no wind and no rain. The surveys are therefore not considered to be seasonally or climatically constrained.

[10] Hundt L (2012). *Bat Surveys: Good Practice Guidelines, 2nd Edition,* Bat Conservation Trust

Table EDP A3.1: Date, Timing and Weather Conditions of Bat Activity Transect Surveys.

Survey Date	Dusk/ Dawn	Survey Time	Sunrise/ Sunset Time	Weather Conditions			
				Temp (ºC)	Cloud (%)	Rain	Wind (Beaufort scale)
27/09/15	Dusk	18:55-20:55	18:56	13-15	20	Nil	0
30/09/15	Dusk	18:47-20:47	18:47	13.5-14.7	0	Nil	3-4
06/05/16	Dusk	20:41-23:21	20:41	15-17	10	Nil	1
27/09/19	Dusk	18:47 – 20:47	18:47	15	70	Nil	2

A3.5 Manual transect surveys were completed by an experienced bat surveyor across one transect survey route. The transect route was designed to cover hedgerows and other potential foraging or commuting habitat within the site (as illustrated on **Plan EDP 3**). The transect route undertaken in 2015 and 2016 was walked at a slow and steady pace with ten 'listening stops'. The transect route undertaken in 2019 was walked at a slow and steady pace with 10 'pacing points'. All bats were recorded and their behaviour marked on survey maps in order to characterise the value of the site and its component habitats to foraging and commuting bats.

A3.6 Activity surveys were conducted using a Wildlife Acoustics EM3+, a BatBox Duet or Echometer Touch Pro and Elekon Batscanner detectors. Observations of the time, location, and activity of all bats seen or heard were noted. Bats were identified on the basis of their characteristic echolocation calls, which were recorded and analysed using computer sonogram analysis (AnalookW) to confirm species identification. Species of *Myotis* bat and long-eared bat are difficult to tell apart solely from their echolocation calls and were therefore grouped as such.

Automatic Detector Surveys

A3.7 To supplement the bat transect survey data, bat activity within the site was also sampled using static bat detectors that automatically trigger and record bat echolocation calls. This survey method was used during the months of September 2015, May 2016 and September 2019 providing a total of three recording periods of six, five and six nights, respectively.

A3.8 Two AnaBat Express Bat Detectors were deployed during the three sampling periods in six different locations over the Application Site, as shown on **Plan EDP 3**. The AnaBats were fixed in secure locations, with an external microphone attached 1-2m above ground, and directed away from the tree to maximise detection sensitivity. **Table EDP A3.2** gives the sampling dates and location details for the AnaBats deployed during the recording periods.

Table EDP A3.2: AnaBat Sampling Dates and Location Details

Dates	Position	Adjacent/Nearby Habitat	Microphone	
			Ht (m)	Direction
18/09/15 - 23/09/15	1 (AEX1)	Hedgerows, arable	1.5m	W
	2 (AEX3)	Hedgerows, semi-improved grassland	1.5m	NW
11/05/16 - 16/06/16	1 (AEX1)	Arable	1m	NW
	2 (AEX2)	Arable	1m	NE
25/09/19 – 01/10/19	1 (AEX 18)	Arable	1.4m	S
	2 (AEX 19)	Arable	1.8m	N

A3.9 The echolocation calls recorded by the AnaBats were filtered specifically for each of the UK's bat species using Analook software filter function. All files passing the various filters were checked manually using sonogram analysis (AnalookW) in accordance with published parameters[11] to confirm the species identification of each bat call. All files that did not pass any of the specific filters used (i.e. noise) were also checked for any missed bat calls and these bat calls were identified.

Limitations

A3.10 The identification of calls and species using Analook software is dependent upon the quality of the recording made which can be influenced by the following factors, which may limit levels of activity and species recorded:

- Weather conditions – rainfall and wind;
- Distance of bat from AnaBat;
- Presence of obstructions through which the noise must pass i.e. trees; and
- Proximity of other noise sources such as roads.

A3.11 None of the automatic detector surveys completed were constrained by unseasonably cold or wet conditions. One of the AnaBats (AEX3 in 2015), however, stopped recording after three nights due to a battery failure. The results from the three nights of recording are still considered to have contributed towards a robust baseline of bat data that were collected, thus the results are not thought to have been unduly affected/constrained by this factor.

[11] Russ (2012). *British Bat Calls, a guide to species identification*. Pelagic Publishing, Exeter

Assessment of Mature Trees for Bat Roosting Potential

Visual Assessment of Trees

A3.12 A visual assessment of all suitable trees on-site for the presence of, or potential to support bats, was undertaken by a Natural England bat licenced ecologist in accordance with current best practice guidelines. The visual assessment was undertaken on 11 May 2016. The trees were searched as thoroughly as possible from ground level, with all elevations covered where accessibility allowed.

A3.13 Suitable features for roosting bats include:

- Loss/peeling/fissured bark;
- Natural holes e.g. rot holes and holes from fallen limbs;
- Woodpecker holes;
- Cracks/splits or hollow tree trunks/limbs; and
- Thick-stemmed ivy.

A3.14 Signs of roosting bats include:

- Bat/s roosting in-situ;
- Bat droppings within or beneath a feature (hole or split);
- Staining around or beneath a feature;
- Oily marks (staining) around roost access points;
- Audible squeaking from the roost;
- Large/regularly used roosts or regularly used sites may produce an odour; and
- Flies around the roost, attracted by the smell of guano.

A3.15 Based upon the results of the visual assessment and features/evidence identified as above, the following ratings for trees were used during the assessment:

- Known or confirmed roost – European Protected Species (EPS) licence required for works to tree to be completed lawfully;

- High potential – Tree supports one or more features that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time;

- Medium potential – Tree supports one or more features that could be used by bats but are unlikely to support a roost type of high conservation status;

- Low potential – Tree supports one or more features that could be used by individual bats opportunistically, or is of sufficient size and age to contain such features; and

- Negligible potential – Negligible features likely to support roosting bats.

Limitations

A3.16 Visual assessments for roosting bats can be undertaken at any time of year and this assessment was not limited by seasonal or climatic factors.

A3.17 It should be noted that this type of assessment is based on features visible from the ground level and is not considered to be a definitive bat roosting survey. Additional survey work may therefore be required to establish if any bats are roosting within the trees and if present, their species, type of roost supported, and size of the roost, should any trees of sufficient potential be subject to felling/tree surgery. If trees are found to support bat roosts during pre-commencement investigations, such works would be subject to a European Protected Species (EPS) licence to commence lawfully.

Aerial Inspection of Trees

A3.18 During the ground based bat roosting assessment undertaken on 11 May 2016, a single ash (*Fraxinus excelsior*) tree within the site was identified as having high bat roosting potential (TN3 on **Plan EDP 2**). Although an aerial inspection of the tree was carried out in 2016, the tree was subsequently lost in a storm and removed from the site at some point between the survey undertaken in May 2016 and the extended phase 1 survey undertaken in September 2019.

Results

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

A3.19 The distribution of bat activity around the site recorded during the surveys is illustrated on **Plan EDP 4** and **Plan EDP 5**, and the detailed results of the manual transect surveys (which are discussed in **Section 3**) are available on request.

Automated Detector Surveys

A3.20 The results of the automated detector surveys are provided in detail in **Table EDP A3.3**, **Table EDP A3.4** and **Table EDP A3.5**, and summarised in **Table EDP A3.6**.

Table EDP A3.3: Automated Detector Survey Results, September 2015

AnaBat	Bat Species	Number of Bat Passes Recorded per Night						Total
		18 Sept	19 Sept	20 Sept	21 Sept	22 Sept	23 Sept	
AEX1	Barbastelle	18	28	24	65	11	14	**160**
	Common pipistrelle	23	26	54	7	3	8	**121**
	Leisler		1					**1**
	Lesser horseshoe	5	5	1	2	6		**19**
	Myotis sp.	25	32	14	15	10	1	**97**
	Noctule	4	6	6		1		**17**
	Soprano pipistrelle				1			**1**
	Serotine	1				1		**2**
	Total	**76**	**98**	**99**	**90**	**32**	**23**	**418**
AEX3	Barbastelle	13	1		AnaBat failed after three nights			**14**
	Common pipistrelle	3	4	1				**8**
	Long-eared bat	1						**1**
	Leisler	1	1	2				**4**
	Lesser horseshoe	1	2					**3**
	Myotis sp.	18	14	5				**37**
	Noctule	3	8	2				**13**
	Serotine	1						**1**
	Total	**41**	**30**	**10**	**-**	**-**	**-**	**81**

Table EDP A3.4: Automated Detector Survey Results, May 2016

AnaBat	Bat Species	Number of Bat Passes Recorded per Night					Total
		11 May	12 May	13 May	14 May	15 May	
AEX1	Barbastelle	5	2		1	4	**12**
	Common pipistrelle	3	9	2	2	8	**24**
	Lesser horseshoe			1			**1**
	Myotis sp.	2	3			5	**10**
	Nathusius pipistrelle	3					**3**
	Noctule	6	1	1	51	35	**94**
	Total	**19**	**15**	**4**	**54**	**52**	**144**
AEX2	Barbastelle					3	**3**
	Common pipistrelle	32	3	2	30	49	**116**
	Long-eared bat	1					**1**
	Lesser horseshoe					2	**2**
	Myotis sp.				3		**3**
	Noctule	1	2	1	21	3	**28**
	Soprano pipistrelle				1		**1**
	Total	**34**	**5**	**3**	**55**	**57**	**154**

Table EDP A3.5: Automated Detector Survey Results, September 2019

AnaBat	Bat Species	Number of Bat Passes Recorded per Night						Total
		25 Sept	26 Sept	27 Sept	28 Sept	29 Sept	30 Sept	
AEX18	Barbastelle	18	51	19	2	17	8	**115**
	Common pipistrelle	187	372	605	264	142	595	**2165**
	Long-eared bat	0	0	3	1	2	3	**9**
	Lesser horseshoe	10	9	31	3	11	12	**76**
	Myotis sp.	81	69	64	7	137	55	**413**
	Noctule	2	0	1	0	3	1	**7**
	Soprano pipistrelle	3	0	3	0	0	0	**6**
	Total	**301**	**501**	**726**	**277**	**312**	**674**	**2791**
AEX19	Barbastelle	128	103	95	20	39	0	**385**
	Common pipistrelle	80	26	47	29	122	35	**339**
	Long-eared bat	10	8	5	0	3	0	**26**
	Lesser horseshoe	6	11	9	5	15	0	**46**
	Myotis sp.	24	19	38	41	129	0	**251**
	Noctule	5	0	2	0	3	0	**10**
	Soprano pipistrelle	11	1	1	0	2	0	**15**
	Total	**264**	**168**	**197**	**95**	**313**	**35**	**1072**

Table EDP A3.6: Automated Detector Survey Summary

Survey month	Species Recorded	No. passes recorded	% of total
September 2015	Barbastelle	174	34.9
	Common pipistrelle	129	25.8
	Long-eared bat	1	0.2
	Lesser horseshoe	22	4.4
	Myotis sp.	134	26.9
	Noctule	30	6.0
	Leisler	5	1.0
	Serotine	3	0.6
	Soprano pipistrelle	1	0.2
	Total	**499**	
May 2016	Barbastelle	15	5.0
	Common pipistrelle	140	47.0
	Long-eared bat	1	0.3
	Lesser horseshoe	3	1.0
	Myotis sp.	13	4.4
	Nathusius pipistrelle	3	1.0
	Noctule	122	41.0
	Soprano pipistrelle	1	0.3
	Total	**298**	
September 2019	Barbastelle	500	12.9
	Common pipistrelle	2504	64.8
	Long-eared bat	35	0.9
	Lesser horseshoe	122	3.2
	Myotis sp.	664	19.2
	Noctule	17	0.4
	Soprano pipistrelle	21	0.5
	Total	**3863**	

Assessment of Mature Trees for Bat Roosting Potential

A3.21 During the visual assessment for roosting bats on 11 May 2016, no bats or evidence of bats was found from ground level at the time of the assessment. However, a single ash tree was identified as offering high potential to support roosting bats.

A3.22 Although an aerial inspection of the tree was carried out in 2016, the tree was subsequently lost in a storm and removed from the site at some point between the survey undertaken in May 2016 and the extended phase 1 survey undertaken in September 2019.

Appendix EDP 4
Reptile Survey

Methodology

A4.1 The Site supports habitats of varying suitability for reptiles; a large area of the site is considered of negligible value owing to its intensive arable management, but the site also supports suitable habitat around its field margins.

A4.2 To confirm the presence, or likely absence, of reptiles from the site detailed refugia based reptile surveys, with reference to best practice guidance[12], were undertaken. Surveys were undertaken in late September-October 2015, and the locations of reptile refugia are illustrated on **Plan EDP 3**.

A4.3 A total of 100 artificial reptile refugia comprising roofing felt sheets measuring approximately 1m x 0.5m were deployed in suitable reptile habitat across the site and the adjacent field, which was within the site boundary at the time of survey, on 22 September 2015. Reptile refugia were left undisturbed *in situ* for a period of seven days prior to the commencement of reptile surveys. A total of seven reptile survey visits were completed at the site. Detailed weather conditions recorded during each survey visit undertaken are summarised in **Table EDP A4.1**. During each survey visit, artificial refugia were individually checked and any reptiles observed, along with notes on their life stage (adult/juvenile) and sex where possible, recorded.

Table EDP A4.1: Date, timing and weather conditions of reptile survey visits undertaken during 2015

Visit Date	Start Time	Air Temp Range (°C)	Wind Speed (Beaufort)	Cloud Cover (%)	Rain
29/09/15	14:00	17-22	1-2	0	Nil
30/09/15	09:55	13-19	1-2	0	Nil
09/10/15	14:10	15	2-3	60-70	Nil
12/10/15	14:00	12-14	1-2	20	Nil
14/10/15	14:30	12-15	1	20	Nil
15/10/15	15:00	12-13	2-3	95-100	Nil
19/10/15	14:00	11-14	0-2	90	Nil

Limitations

A4.4 The reptile surveys were undertaken towards the end of the optimal survey period, and although they were completed during the warmest times permissible during the October 2015 surveys (usually mid-afternoon), the results are considered to potentially have been constrained by these timings.

[12] Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth; DMRB (2005) *Nature conservation advice in relation to reptiles and roads. Volume 10, Section 4, Part 7, HA/116/05.* DMRB

Results

A4.5 The surveys recorded no reptiles within the site. Due to the recent records of slow-worm and grass snakes from within the village, within a few hundred metres from the site, their presence is assumed (at least in small numbers) in the adjacent field and potentially around the margins of the site (most notably in the east and north where these two species could take advantage of the marginal habitat provided by gardens backing onto the arable field edges). However, despite the sub-optimal timing of the surveys it is considered likely that if large populations of reptiles are present within these habitats at least some specimens would have been recorded.

Plans

Plan EDP 1	Statutory Designated Sites (edp3036_d020a 04 October 2019 GY/WC)
Plan EDP 2	Phase 1 Habitat Plan (edp3036_d009a 27 September 2019 LB/PR)
Plan EDP 3	Reptile Refugia and Anabat Locations (edp3036_d010b 27 September 2019 MC/PR)
Plan EDP 4	Bat Transect Results (edp3036_d011b 27 September 2019 MC/PR)
Plan EDP 5	Bat Transect Results 2019 (edp3036_d021 04 October 2019 RB/MMc)

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