

6.0 Biodiversity

6.1 Introduction

This chapter of the ES has been prepared by the Environmental Dimension Partnership Ltd (EDP) and assesses the likely significant effects of the proposed development with respect to flora and fauna. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the site and surrounding area; the mitigation measures required to prevent, reduce or offset significant adverse effects; and the likely residual effects after these measures have been adopted.

The chapter has been prepared with reference to The Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment Guidelines (CIEEM, 2018) and it has also been prepared and reviewed by experienced EDP Ecologists who are members of CIEEM.

This chapter assesses the impacts and consequential ecological effects that may occur to Important Ecological Features (IEFs) from the proposed development. IEFs include designations, habitats, protected and priority species of plants and animals (terrestrial and aquatic).

For reasons of clarity, and due to the quantity of baseline ecological information collated during the assessment, the detailed methods, results and a full set of associated drawings are provided in *Appendix 6.1*. In addition, a quantitative assessment of the net effect of the proposed development upon biodiversity overall (using the Warwickshire metric) is detailed within *Appendix 6.2*.

Table 6.1 - Figures and Appendices	
Figures	Title
<i>Figure 6.1</i>	Phase 1 Habitat Plan
<i>Figure 6.2</i>	Locally Designated Sites
Appendices	Title
<i>Appendix 6.1</i>	Ecological Baseline Report
<i>Appendix 6.2</i>	Biodiversity Impact Assessment Calculations
<i>Appendix 6.3</i>	Planning Policy and Legislation

6.2 Scoping, Consultation and Overview of Potential Effects

The scope of the assessment includes the following:

- The potential direct and indirect impacts of the proposed development on statutory and non-statutory designated sites within the potential zone of influence and within the site;
- The potential direct impacts of the proposed development on habitats and protected species located within the site;
- The potential indirect impacts of the proposed development on habitats and protected species located within the site; and

The scoping response provided by the ecological officer on the 5 July 2018, stated that appropriate surveys for protected and notable species should be carried out and that they should be assessed in accordance with the CIEEM guidelines. The required surveys have all been undertaken and are provided at *Appendix 6.1*.

It also stated the need for appropriate buffers to the ancient woodland and Hall Brook need to be considered at an early stage. This has formed part of the design process and is discussed more within this chapter.

The scoping response also advises that biodiversity net gain needs to be assessed. This has been undertaken using the Warwickshire Biodiversity Impact Assessment (BIA) matrix and is provided at *Appendix 6.2*.

6.3 Assessment Methodology

The following topic-specific legislation, policies and guidance are relevant to the assessment.

6.3.1 Legislation

The legislative context for Ecology and Biodiversity is governed by 'The Conservation of Habitats and Species Regulations' 2017; The Wildlife and Countryside Act 1981 (as amended, principally by The Countryside and Rights of Way Act 2000 and The Natural Environment and Rural Communities (NERC) Act 2006); the Animal Welfare Act 2006; the Protection of Badgers Act 1992; and the Hedgerow Regulations 1997.

The legislation is explained in full at *Appendix 6.3*.

6.3.2 Planning Policy Context

A detailed breakdown of the planning policies relating to ecology and biodiversity is provided at *Appendix 6.3*. It details the provisions of Chapter 15 of the National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), July 2018) at the national level and at the local level within the Coventry City Council Local Plan.

6.3.3 Relevant Guidance

This assessment has been undertaken with reference to the industry's recognised guidelines published by the CIEEM in 2018. In addition, the following best practice guidance in relation to survey techniques and mitigation measures have been taken into account:

- British Standards Institute (2013) BS 42020 – Biodiversity – Code of Practice for Planning and Development;
- Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit;
- Gilbert, G., Gibbons D.W & Evans, J. (1998) Bird Monitoring Methods;
- Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London;
- Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation;

- Harris, S., Cresswell, P., and Jeffries, D.J. (1989) *Surveying Badgers*, Mammal Society, London;
- Joint Nature Conservation Committee (1999) *Bat Workers Manual*;
- English Nature (2004a) *Bat Mitigation Guidelines*; and
- Froglife (1999) *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10, Froglife, Halesworth.

6.3.4 Study Area

The extent of the study area has been defined as the ecological zone of influence of the project. This has been determined through a review of the baseline ecological conditions relative to the site in the context of the proposed activities. It has also been informed by liaison with consultees and other specialists involved in assessing the effects on other disciplines of the project, as considered within this ES and other supporting documentation.

The scope of the desk study reflects the sensitivity and value of potential ecological receptors while providing contextual information to assist with determining and evaluating the baseline conditions. The following desk study search radii were employed and are considered to be sufficient to cover the ecological zone of influence of the project:

- International statutory designations – 10 kilometre radius;
- National statutory designations – 5 kilometres;
- Non-statutory local sites – 2 kilometres;
- Annex II bat species records – 4 kilometres; and
- All other protected/notable species records – 2 kilometres.

The field surveys undertaken to inform the assessment cover the site and, where access allowed, the surrounding habitats to provide contextual information to further inform the assessment.

6.3.5 Surveys and Data Collection

The baseline ecology information collated for the site (including species' scientific names) is set out in detail within *Appendix 6.1*. The appendix details the full methodologies employed, their findings and limitations. It seeks to identify the IEFs within the projects' ecological zone of influence.

A summary of the baseline investigations undertaken for the site in 2017 and 2018 are provided below:

- Desk study;
- Extended phase 1 habitat survey;
- Botanical and Hedgerow survey;
- Great crested newt Survey;
- Breeding bird survey;

- Building and Tree inspections for bats and barn owls;
- Bat activity surveys including manual transects and static detectors;
- Badger surveys; and
- Reptile surveys.

As detailed further in *Appendix 6.1*, and referenced where appropriate, the scope of survey work was informed by the extended phase 1 habitat survey, desk study and previous surveys pertaining to the adjacent sites. The reasoning behind certain surveys being 'scoped out' due to not being considered necessary or appropriate in this case, is also provided in *Appendix 6.1*.

All surveys were undertaken with reference to best practice guidance where available. Limitations in the survey work are detailed in *Appendix 6.1* and those of note summarised in the 'Limitations of the Assessment' section below. Where relevant, such limitations have been factored into the assessment process.

6.3.6 Assessment Criteria and Assignment of Significance

Valuing Important Ecological Features

An evaluation of IEFs has been made with reference to CIEEM's Ecological Impact Assessment Guidelines (CIEEM, 2018) (hereafter referred to as 'the guidelines'). A summary of the evaluation approach is provided below.

The guidelines advocate an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts, who know the locality of the project and/or the distribution and status of the species or features that are being considered.

The guidelines recommend that the value or potential value of an ecological resource or feature should be determined within a defined geographical context, and the guidelines provide a geographical range (frame of reference) that can be adopted. The geographical frame of reference, based upon the CIEEM guidelines, used in this assessment, is as follows:

- **International value:** SACs, SPAs, Ramsar sites;
- **National value:** SSSIs and NNRs;
- **County value (within Warwickshire):** Local Nature Reserves, Local Wildlife Sites, ancient woodlands, atypical and diverse species assemblages with good population sizes;
- **District value (within Coventry City):** e.g. watercourses, ponds, hedgerows, woodland – where species rich/extensive/atypical examples are present – moderate to high population sizes or species assemblages with moderate to high diversity);
- **Local value (within the Parish):** e.g. watercourses, ponds, hedgerows, woodland – common and widespread species with relatively moderate populations and relatively limited diversity;
- **Site value (the site and immediate environs):** small areas of common habitats such as grassland and scrub – common and widespread species with small populations and limited diversity; and

- **Negligible value:** typically applied to areas of open ground, built development and areas of hardstanding.

Valuing Designated Sites

Some sites have already been assigned a level of nature conservation value through designation, and the guidelines recommend that the reasons for this designation are to be taken into account in the assessment.

Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Biodiversity

The guidelines state that there are various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity and that consultation, especially with local specialists, can be crucial for identifying less obvious important resources and features.

Valuing Habitats

The guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available. Where areas of a habitat or plant community do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate.

Valuing Species

The guidance deals with species that need to be assessed because they are of biodiversity value, rather than because they are legally protected (although some species may fit in both categories).

In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. The valuation of populations should make use of any relevant published evaluation criteria.

Assessment of Potential Impacts

The guidelines advocate an approach to assessing potential impacts that involves professional judgement based on available guidance and information.

The guidelines recommend that the process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. The assessment of the potential impacts of the project takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features within the project's zone of influence. Impacts can be permanent/temporary, direct or indirect, beneficial or adverse and can include:

- Direct loss of wildlife habitats;

- Fragmentation and isolation of habitats;
- Disturbance to species from noise, light or other visual stimuli;
- Changes to key habitat features; and/or
- Changes to the local hydrology, water quality and/or air quality.

When describing changes/activities and impacts on ecosystem structure and function, reference is made to the following factors:

- The magnitude of the impact;
- The spatial extent over which the impact would occur;
- The temporal duration of the impact;
- Whether the impact is reversible and over what timeframe; and
- The timing and frequency of the impact.

Where possible, the magnitude of the impact is quantified. However, professional judgement is often required to define the magnitude using the criteria defined in *Table 6.2*, which also take into account the other characterisation of impacts listed.

Magnitude	Definitions/Characterisation
High	A permanent or long-term impact on the integrity of a site or conservation status of a habitat, species, assemblage/community, population or group.
Medium	A long-term but reversible impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group.
Low	A short-term but reversible impact on the integrity of a site or conservation status or a habitat, species assemblage/community, population or group that is within the range of variation normally experienced between years.
Negligible	No perceptible change or a short-term but reversible impact on the integrity of a site or conservation status of a habitat, species, assemblage/community, population or group that is within the normal range of annual variation.

Significance of Effects

Having followed the process of attributing importance to an ecological feature and characterising potential impacts, the significance of an effect is then determined. There is no agreed absolute method for assessing the significance of effects on nature conservation features. The guidelines advocate the assessment to be undertaken according to professional judgement with the characterisation of impacts described above and factors such as the size, conservation status and conservation objectives of a species/habitat and their natural geographical range, used to determine whether an effect is significant at a particular geographic scale.

The guidelines state that:

“For the purpose of EclA, ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in

general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local."

The assessment of significant effects upon designated sites is described as follows by the guidelines and has been used in this assessment to determine whether the effects of the project on a designated site are likely to be significant:

"Significant effects encompass impacts on structure and function of defined sites and ecosystems. The following need to be determined: For designated sites - is the project and associated activities likely to undermine the site's conservation objectives, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features."

The conservation status of habitats and species within a defined geographical area is described as follows, and has been used in this chapter to determine whether the effects of the project on non-designated habitats and species are likely to be significant:

"Habitats - conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area;

Species - conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area."

On the basis of the above, and within this assessment, ecological effects are described as either:

- Direct and/or indirect,
- Permanent or temporary; and
- Adverse or beneficial.

Where mitigation measures have been incorporated into the design of the project, or are standard construction measures, and are committed to by the applicant (for example, shown on the parameter plans or in the draft Construction Environmental Management Plan in *Appendix 4.1*), these have been taken into account during the assessment of effects. The assessment takes into account the likely success of the mitigation.

Where necessary, further actionable mitigation measures have been identified. The significance of the effects upon IEFs has been assessed both before and after consideration of further mitigation measures. The latter represents the assessment of the residual effects of the project.

In addition, to ensure consistency in the terminology and approach used by different disciplines across the ES, categories for assigning levels of significance have been included according to the criteria set out in *Table 6.3* combined with professional judgement.

		Table 6.3 – Significance of Effects					
		Importance of Receptor (Highest geographical level at which impact is significant)					
		International	National	County	District	Local	Site
Impact Magnitude	High	Substantial	Substantial	Moderate	Moderate	Minor	Negligible
	Medium	Substantial	Substantial	Moderate	Minor	Minor	Negligible
	Low	Substantial	Moderate	Minor	Minor	Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Assessment Scope

The purpose of an EIA is to focus on potentially significant effects, it is not reasonable therefore to expect the assessment to include every ecological feature that may be affected, since effects are unlikely to be significant where features of low (site level or below) value or sensitivity are, for example, subject to low or short-term impacts. On this basis, the assessment therefore focuses on ecological features that are considered by EDP, based on professional judgement, experience and contextual information, to be legally protected and/or of local nature conservation value or above.

However, this does not mean that effects upon features of less than local level nature conservation value have been discounted. Certain species and habitats that may not constitute IEFs based upon their nature conservation value, may still warrant consideration during the design of the proposed development (and mitigation identified) on the basis of their legal protection, their implications for policies and plans, or other issues, such as animal welfare.

The guidelines also recommend that where ecosystem service provision (i.e. the benefits people derive from the natural environment) might be affected as a result of a project's ecological effects, this should be recognised and the relevant data collected during the assessment to inform separate specialist assessments of social and economic value. This can enable the social and economic implications of ecological changes to be taken into account.

Temporal Scope

Potential impacts on ecological features have been assessed in the context of how the predicted baseline conditions within the ecological zone of influence might change between the surveys and the start of construction.

It is anticipated that a phased work programme will commence in winter 2020/21, with works being complete by 2028. Changes in future baseline conditions in the absence of the project due to climate change have also been considered.

Cumulative Assessment

Cumulative effects have been considered, based upon the other developments that make up the Keresley Suitable Urban Extension (SUE) as described in *Chapters 2 and 4*, with respect to the potential for cumulative impacts to arise upon IEFs.

6.3.7 Limitations of the Assessment

The vast majority of surveys has been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. All of the surveys have been completed by suitably qualified surveyors.

The reptile surveys were disrupted by members of the public moving the mats. Where necessary, mats were replaced or returned to suitable reptile habitat and writing included on the mats to explain their purpose. The surveys are therefore not considered to have been significantly limited by this public disruption.

It should also be noted that the surveys provide a snap shot in time and owing to the seasonality of some species, as well as the ability for some species to quickly colonise sites, the presence of species and habitats on site may change over time. However, it is considered that the results of the Phase 1 survey and additional Phase 2 surveys are robust and reliable for the identification of the habitats and the presence or absence of legally protected species and other IEFs within the site at the current time.

6.4 Baseline Conditions

This section summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations described above. In particular, this section identifies and evaluates those ecological features/receptors that lie within the site's potential zone of influence and are pertinent in the context of the project.

Full results of the surveys undertaken are provided within *Appendix 6.1*, and the location of ecological features is shown on *Figure 6.1*.

6.4.1 Description of the Site

The site is bound by roads on the western and north-eastern border, along with grazing pasture fields, agricultural fields, woodland and residential properties. Surrounding land use is dominated by residential properties with associated gardens and roads to the west, and grazing pasture fields and agricultural fields to the north, south and east, with some woodland in the north and south.

The site comprises fields of varying sizes in use as grazing pasture, seasonally cut grassland or rough grassland. Hedgerows are present on the majority of external boundaries as well as the internal field boundaries. A number of mature trees are present within these hedgerows as well as scattered across site. "The Alders" and "Pikehorne Wood" are adjacent to the site boundary in the north and east. There are four ponds present within the boundaries of the site and the Hall Brook flows in from the north, south into a pond, then south-east along the southern boundary.

6.4.2 Designated Sites

Statutory Sites

No part of the site is covered by a statutory ecological designation. However, there is one international designation within the site's potential zone of influence. Ensor's pool, designated as a Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI) and a Local Nature Reserve (LNR), is situated approximately 7.5km north-east of the site.

Ensor's Pool is a small site (3.86ha) and it is designated for its large population of white-clawed crayfish (*Austropotamobius pallipes*). It appears that the latest surveys undertaken in 2015 recorded no presence of white clawed crayfish. The distance of separation of this designation from the site and that Hall Brook is not connected hydrologically, would prevent direct effects from the proposed development on these designations. Although consideration should be given to potential indirect effects, in particular recreational disturbance caused by increased numbers of visitors, given that the white clawed crayfish no longer appear to be present it is highly unlikely that the proposed development would result in significant effects.

For these reasons described, a Habitat Regulations Assessment for the proposed development is not required.

There are no other statutory designated sites within the site's zone of influence and therefore, no statutory designations are considered to qualify as IEFs requiring consideration within the assessment.

Non-statutory Sites

There are 57 non-statutory designated sites within 2km of the site, including Local Wildlife Sites (LWS), potential LWSs (pLWS), local green spaces (LGS) and 'ecosites' (which are also deemed to be of nature conservation importance within Warwickshire, but no formal assessment has been made).

There are three ecosites located within the site and a further three that are located adjacent to the site. *Table 6.4* and *Figure 6.2* show those considered pertinent in relation to future development. In this case the site's 'zone of influence' is considered to be within the site's boundaries or closely adjacent.

Site name (and Reference)	Designation	Distance from Site	Reasons for Designation
Five Field Road	Ecosite (with an ungraded status)	Within site	A waste field bordering arable land, with hawthorn <i>Crataegus monogyna</i> , and blackthorn <i>Prunus spinose</i> , scrub developing. The road verge is on sandy soil and supports dwarf gorse <i>Ulex minor</i> , broom <i>Cytisus scoparius</i> , harebell <i>Campanula rotundifolia</i> and perforate st johns wort <i>Hypericum perforatum</i> .

Table 6.4 - Non-statutory site designations within the site's zone of influence			
Site name (and Reference)	Designation	Distance from Site	Reasons for Designation
Hall Brook	Ecosite (with an ungraded status)	Within site	The brook contains brooklime <i>Veronica beccabunga</i> , celery-leaved crowfoot <i>Ranunculus sceleratus</i> , fool's watercress <i>Apium nodiflorum</i> and a number of rush species. The adjacent hedgerow contains hawthorn <i>Crataegus mongyna</i> , hazel <i>Corylus avellana</i> , holly <i>Ilex aquifolium</i> , field maple <i>Acer campestre</i> , blackthorn <i>Prunus spinose</i> and crab apple <i>Malus sylvestris</i> .
Durham House Farm and Manor Farm South	Ecosite (with an ungraded status)	Within site	Durham House Farm & Manor Farm South is split into two parts with Keresley Road dividing the two. The western side is mostly farmland comprising arable fields, improved grassland and horse grazed pasture. The eastern side is significantly smaller and consists of two arable fields and improved grassland.
Pikehorne Wood, Keresly Mere and The Alders	Local Wildlife Site (also designated as Ancient Woodland.	Adjacent to the site to the north and east of the smaller parcel along Tamworth Road.	<p>The LWS comprises Pikehorne Wood, the adjoining wood called The Alders, the large pool known as Keresley Mere and areas of seepage fed rush pasture and semi improved grassland associated with the above.</p> <p>Pikehorne Wood is dominated by birch <i>Betula</i> sp, rowan <i>Sorbus aucuparia</i> and oak <i>Quercus</i> sp, with bracken <i>Pteridium aquilinum</i>, bramble <i>Rubus fruticosus</i> and bluebell <i>Hyacinthoides non-scripta</i> dominating the ground flora.</p> <p>The adjacent Alders is wetter with less acidic soils with a greater dominance of alder <i>Alnus glutinosa</i> and ash <i>Fraxinus excelsior</i>. A variety of wetland plants are present including marsh marigold <i>Caltha palustris</i>, brooklime <i>Veronica beccabunga</i>, meadowsweet <i>Filipendula ulmaria</i>, bittercress <i>Cardamine</i> sp and gypsywort <i>Lycopus europaeus</i>.</p>
Keresley Manor	Ecosite (with an ungraded status)	Adjacent to the south of the site	The grounds of the manor consist of mixed woodland, lawns and gardens. The woodland is a plantation with oak <i>Quercus</i> sp, ash <i>Fraxinus excelsior</i> , birch <i>Betula</i> sp, larch <i>Larix deciduas</i> and scots pine <i>Pinus sylvestris</i> . The understorey comprises of holly <i>Ilex aquifolium</i> and hawthorn <i>Crataegus monogyna</i> , whilst the ground flora is poor.

Table 6.4 - Non-statutory site designations within the site's zone of influence			
Site name (and Reference)	Designation	Distance from Site	Reasons for Designation
Manor Farm, Keresley	Part LWS with the rest ecosite (with an ungraded status)	Adjacent to the north of the site	<p>A small part of the site to the south-west is designated as Pikehorne Wood Keresley Mere and The Alders Local Wildlife Site (LWS).</p> <p>Majority of the site has nature conservation status ungraded. Seven fields off Five Field Road formerly used for grazing but now arable. Site contains dried out pond, surrounded by hawthorn <i>Crataegus monogyna</i> and willow <i>Salix</i> sp scrub with occasional mature pedunculate oak <i>Quercus robur</i> standards.</p>

Pikehorne Wood, Keresley Mere and The Alders LWS are designated as ancient woodland and although access was not possible to the area adjacent to the site the descriptions and designations make it an IEF at the **County** level.

Ecosites are not specifically protected by policy or legislation, however they are highlighted within the district as having potential to have biodiversity value. The reasons for designation, results from the Extended Phase 1 Survey and a further Botanical Survey suggest that the ecosites located within the site hold little ecological value (as described below), and would not qualify as Local Wildlife Sites and are therefore not considered at the County level.

Five Field Road is currently used as a horse paddock and although a small triangle of scrub remains, no evidence of broom or dwarf gorse could be identified. This site has no more than **Site** value.

The Durham House Farm and Manor Farm South sections within the site are horse grazed pastures and although some areas of more species rich grassland were recorded have no higher than **Local** value in places.

Hall Brook is a narrow stream with the banks on the eastern side, which fall within the site, heavily poached by horses. The hedge on the western bank shades the brook and limits the aquatic vegetation. However, the brook corridor is still likely to act as a wildlife corridor through the valley. Therefore, Hall Brook is considered to have **Local** value, but not District or County value.

6.4.3 Habitats

A full description of the habitats present within the site is provided in *Appendix 6.1* and the distribution of habitats within the site is shown on *Figure 6.1*. In summary, the main habitats found and described within the site include:

- Semi-improved Neutral Grassland;
- Species-poor Semi-Improved Grassland;
- Improved Grassland;
- Ponds, three of which are artificial fishing ponds;

- Watercourse;
- Hedgerows;
- Woodland;
- Dense Scrub;
- Tall Ruderal and Ephemeral;
- Amenity Grassland;
- Built Environment; and
- Scattered Trees.

The site principally comprises grazed pasture fields. Some areas of the semi-improved neutral grassland would be regarded as having **Local** level value given its species diversity, but the majority of the grassland such as the improved, amenity, species poor semi-improved and over grazed sections of the semi-improved neutral grassland have no higher than **Site** level value. The areas of semi-improved neutral grassland regarded as having Local level value are fragmented within the other areas of semi-improved neutral grassland. The fragmentation would limit the habitat being regarded as a priority habitat, but its species composition warrants its increase in value.

Hedgerows are present on the majority of external boundaries as well as forming internal dividers between the fields. Several mature trees are present within these hedgerows and as standard trees. A watercourse (Hall Brook) flows south east through the centre of the Site.

Those habitats that are regarded as being IEFs are those with Local level value or higher. These relate to the areas of semi-improved neutral grassland (**Local** value), watercourse (**Local** value), ponds (**Local** value), woodland (**Local** value), hedgerows (**Local** value) and mature trees (**Local** value).

6.4.4 Species

All species which have been assessed as being an Important Ecological Feature are discussed below. Species which have been scoped out as IEFs are discussed further in the ecology baseline report.

Bats

There are six buildings present within the site and a number of mature trees also present. The Site is bounded by hedgerows and trees which offer opportunities for foraging and commuting bats in combination with the woodland edge, scrub, watercourse and pond habitats scattered across the Site.

Full results of the bat surveys undertaken to date can be found in Annex EDP 2 of *Appendix 6.1* and are summarised below.

Roosting Bats

The majority of buildings within the site hold no bat roosting potential being agricultural buildings, or stables with no voids, roof tiles or soffits that could support roosting bats. One of the stable buildings to the west of the site had clay tiles over felt, but all of the tiles were in

good condition with no gaps, or potential access points for roosting bats and it was deemed that the building had very low roosting potential.

There are a number of trees on site or adjacent and the majority of these trees have little potential to support roosting bats. However, there are 75 mature trees, predominantly within hedgerows and woodland edge, which do have suitability to support roosting bats, as illustrated on Plan EDP 3 of *Appendix 6.1*. Eight trees have high suitability to support roosting bats, whilst one has moderate/high suitability, 20 have moderate suitability and a further 46 have low suitability. It is considered that the site has potential to support roosting bat assemblage of **Local** level value.

Foraging and Commuting Bats

Detailed results from the dusk and dawn activity surveys and 24 nights of static detector recordings are provided in Annex EDP 2 within *Appendix 6.1*.

The activity survey recorded moderate levels of commuting and foraging bat activity principally associated with the hedgerows and waterbodies across the site. The highest levels of activity recorded by the static detectors was on the northern boundaries adjacent to off-site woodland “The Alders” and “Pikehorne Wood”.

The vast majority of activity recorded on both the transect and static detector surveys was by common and widespread species with common pipistrelle bats (*Pipistrellus pipistrellus*) accounting for 89.5% of the static detector recordings. Soprano pipistrelle (*P. pygmaeus*), noctule (*Nyctalus noctula*), Myotis species (*Myotis sp.*) and Leisler’s bat (*Nyctalus leisleri*) were the only other species recorded, in very low numbers, on the transects.

Within the static detector results the most recorded species other than the common pipistrelle were soprano pipistrelle (4.1%), Myotis sp. (4.1%) and noctule (2.1%). Leisler’s bat was recorded on 21 occasions, and Long-eared bat species and barbastelle were recorded on 1 occasion respectively (all lower than 1%).

Most of the species recorded are considered to be widespread in central England and their presence in such numbers is not considered to be significant beyond a local context. However, there was a single recording of a barbastelle which is one of the four Annex II species¹ found within the UK. The site is located within the range for the species and as such it is expected that low numbers would be present in the area. Therefore, the presence of a single pass by a barbastelle implies no more than a **Local** level of importance.

The bat assemblage recorded within the site is considered to be relatively typical for an urban edge farmland site in central England with common and widespread generalist species accounting for the vast majority of foraging and commuting activity. The assemblage of foraging/commuting bats is therefore considered to be of **Local** value.

Birds

The site supports a network of hedgerows, scrub, woodland and trees which present a variety of opportunities for breeding birds, particularly common and widespread generalist species.

¹ Annex II of the Habitats Directive lists species to which a strict protection regime, greater than that provided within UK law, must be applied across their entire natural range within the EU, both within and outside of sites designated primarily for the presence of such species.

This has been confirmed through a pilot breeding bird survey which has recorded a typical breeding bird assemblage for an edge of settlement, pasture and woodland edge site. A total of 40 species were recorded during the survey of which 31 were deemed as potential/probable breeders or confirmed breeders. The majority of the species recorded were generalists species, although a small number of notable breeding species were recorded including more specialist woodland and wetland species. These included six species on the red list of conservation concern and three on the amber list of conservation concern.

Full results can be found in Annex EDP 3 of *Appendix 6.1*.

The breeding assemblage at the site is considered to be of **Local** to **District** importance due to a relatively high diversity of species, but lack of significant numbers of rare or notable species.

Otter and Water Vole

A single record for water vole (*Arvicola amphibius*) 1.7km from the site was returned by the desk study. Owing to the age of the record which was dated 1988 and lack of suitable habitat within the stream on the site, water vole are considered to be absent.

No records of otter (*Lutra lutra*) were returned by the desk study. The watercourse on-site was assessed as having limited suitability to support otter or water vole due to the lack of vegetation, over shading and the lack of depth. No signs of either species were noted during checks of the watercourse and ponds within the site.

Reptiles

The desk study returned records of common lizard (*Zootoca vivipara*) and grass snake (*Natrix natrix*) within close proximity to the site. The site supports habitats suitable for reptiles, namely rough grassland, woodland, scrub and hedgerows.

Detailed results from the seven reptile surveys can be found in Annex EDP 4 of *Appendix 6.1*. The reptile surveys recorded one juvenile grass snake at the eastern extent of the site, near two ponds (ponds P3 and P4).

Juvenile grass snakes disperse from their nest once they have hatched and seek a suitable place for hibernation. No adults were recorded, and given that only one juvenile was recorded, it is highly unlikely that a significant breeding population of grass snake exists within the Site.

Grass snakes are common and widespread in Warwickshire and given the very low number are considered to be of no more than **Site** level importance.

Amphibians

Great crested newt (*Triturus cristatus*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*) records within the site were all returned as part of the desk study. As well as these species, smooth newt (*Lissotriton vulgaris*) records were also returned from the surrounding landscape. The species assemblage returned from the desk study is considered typical for an urban edge farmland site in central England.

The site supports four ponds (P1 to P4 on *Figure 6.1*) and there is an off-site pond adjacent to the eastern boundary (P5 on *Figure 6.1*). Ponds P2, P3 and P4 are artificial fishing ponds

and will be removed as part of the proposed development. Along with aquatic habitat, the site supports hedgerows, grassland, woodland and scrub which provide suitable terrestrial habitat for great crested newts.

The ponds within the site and adjacent, off-site pond were subject to a HSI assessment and eDNA sampling, detailed results of which can be found within Annex EDP 5 within *Appendix 6.1*. The eDNA survey returned a positive result for the presence of great crested newt eDNA in P5 located outside of the boundary of the site (see *Figure 6.1*), but was negative for all the ponds within the site. Given that the positive pond is outside but adjacent to the site boundary, it is considered that great crested newts use some areas of the site as part of their terrestrial range for foraging and hibernating, namely the hedgerow, scrub and areas of rough grassland adjacent to the pond in the east.

Previous surveys completed in 2015 of pond P5 have found it to contain a low population of great crested newts and given that the pond has become more silted and encroached by scrub the pond is likely to support no more than a low population of great crested newts.

Great crested newts are relatively common across Warwickshire and given the presence of a low population within an offsite pond, the population is considered to be of no more than **Local** importance.

Badger and other mammals

No records of badger (*Meles meles*) were returned by the desk study. There are two records of hedgehog within 1km of the Site in addition to a historic (greater than 10 years) record of brown hare (*Lepus europaeus*). Two historic records for polecat (*Mustela putorius*) were returned within 2km of the Site, however there are no recent records and both were located over 1.5km from the site boundary. The site has potential to support polecat but its presence would be no more than site level value.

The site supports woodland and hedgerow which provides suitable opportunity for badger sett building and foraging. Given the presence of woodland adjacent to the site, namely “The Alders”, “Pikehorne Wood” and “The Manor Woods” it is likely that badgers are present in the area and likely to use the site.

A single active annexe badger sett along with snuffle holes and a latrine was recorded in the western extent of the site. No further evidence of badger or other mammal activity was recorded during subsequent surveys for other species groups. The habitats on site are considered to provide foraging and commuting opportunities for badger, with limited sett building opportunities also present. Given the surrounding landscape offers similar opportunity to badgers as the habitats present on-site, it is considered that the site is of **Site** value

Invertebrates

A number of invertebrate records were returned as part of the desk study, however, the habitats that make up the majority of the site are not considered to offer significant opportunities for invertebrates. Several records of Section 41 priority species, all of which are moths and butterflies, were returned scattered within 2 km of the Site. Only two records were recorded within 1km on the site boundary.

Invertebrates are not considered further within this chapter except with respect to biodiversity enhancements.

6.4.5 Summary of Important Ecological Features

Informed by the baseline investigations and consultations described above, the IEFs taken forward for detailed assessment, comprise those assessed to be of **Local**-level nature conservation importance or above or where less than local level, if legal protection is afforded to them, as summarized in *Table 6.5*.

Table 6.5 - Summary of Important Ecological Features		
Important Ecological Feature	Key Attributes	Nature Conservation importance
Non-Statutory Designations		
Pikehorne Wood, Keresley Mere and The Alders LWS	Ancient Woodland with large pool and seepage fed rush pasture	County
Habitats		
Semi-Improved Neutral Grassland	Scattered through the site where over grazing has not degraded grasslands	Local
Hedgerow, Woodland and Tree Network	Local dispersal corridors for wildlife in a mostly pastoral landscape. There are several mature standard trees within the hedgerows which have a greater value. Hedgerows are also regarded as Priority Habitats.	Local
Ponds	Permanent water bodies supporting aquatic species and forming part of the local ecological network	Local
Watercourse	Seasonally wet stream forming a wildlife corridor connecting water bodies.	Local
Species		
Foraging and Commuting Bat Assemblage	Activity relatively typical for an urban edge farmland site in central England with common and widespread generalist species accounting for the vast majority of foraging and commuting activity. Foraging activity was focused largely around the woodland edge and water course. Assemblage considered typical for the habitats and locality.	Local
Roosting Bats	Roosting opportunities within 75 mature trees and low potential in one building.	Local
Breeding Birds	Breeding assemblage at the Site is of a relatively high diversity of species, but lack significant numbers of rare or notable species	Local to District
Badger	A single active annexe badger sett along with snuffle holes and a latrine was recorded in the western extent of the Site. The presence of a sett on a site of this size is not unexpected although badger is included as an IEF by virtue of its legal protection.	Site

Table 6.5 - Summary of Important Ecological Features		
Important Ecological Feature	Key Attributes	Nature Conservation importance
Non-Statutory Designations		
Great Crested Newts	Four ponds on-site, with negative results from eDNA, with one off-site pond positive adjacent to the site. Low population recorded within the pond. On-site ponds stocked with large fish likely to make ponds unsuitable for breeding great crested newts.	Local

In accordance with the assessment methodology described earlier, all other designated sites, habitats and species/species groups are deemed to be of only **Site**-level nature conservation importance or less, and will not be taken forward for detailed assessment since effects upon such features are unlikely to be 'significant'. However, species such as reptiles and invertebrates, are considered with respect to mitigation measures in context of their legal protection and/or biodiversity policy.

6.4.6 Future Baseline

It is anticipated that in the absence of development the site would be retained as grazing pasture and improved grassland, with other habitats and species interest unlikely to change significantly.

It is not considered that the species or habitats identified would be significantly affected by or vulnerable to climate change in the future. The important habitats and species identified are not considered to be susceptible to such changes and the site is not near the edge of their ranges.

It is probable that the existing baseline described above would therefore, not appreciably change.

6.5 Mitigation Measures

6.5.1 Inherent Mitigation Measures

The key inherent mitigation measures, as shown on the Parameter Plans and Illustrative Landscape Strategy, pertinent to the ecological impact assessment include:

- Provision of a minimum, 15m buffer around Pikehorne Wood, Keresly Mere and The Alders LWS from the proposed development;
- Provision of a minimum 20m buffer along Hall Brook to provide a green infrastructure network;
- Retention of areas of semi-improved neutral grassland;
- Retention of woodland, tree groups and trees, including the provision of appropriate buffers;
- Retention and provision of buffers along the majority of the hedgerow resource and boundary vegetation;

- Retention and provision of buffer around the existing pond (Pond 1) and buffer offsite pond, with great crested newts;
- Retention and buffering of the active badger setts;
- Provision of new woodland and hedgerow planting along the Green Infrastructure corridors; and
- Provision of informal areas of open space comprising grassland habitat (meadow and marshy grasslands) and supporting swales and other Sustainable Drainage Systems (SuDs), set primarily adjacent to the retained stream, hedgerow and tree habitat.

The extent of important ecological habitats within the site and the quantities retained, lost and proposed have been assessed using the Biodiversity Calculator produced by Warwickshire County Council. These biodiversity impact assessment calculations, which are provided in *Appendix 6.2*, have been used to objectively provide an overall biodiversity score for the proposed development.

It should be noted that this score is based on the Land Use Parameter Plan in tandem with an Illustrative Landscape Strategy and may therefore, be subject to a degree of variance at the reserved matters stage. However, these plans are considered to be appropriate for assessing the overall biodiversity impact of the proposed development at this stage.

6.5.2 Standard Mitigation Measures

Construction Phase

Proposed standard construction mitigation measures are included in the draft Construction Environmental Management Plan (CEMP) provided at *Appendix 4.1*

During construction, ecological mitigation measures will be set out within a full CEMP or an Ecological Construction Method Statement (ECMS) for each phase of development. This will detail methodologies to be followed during vegetation clearance, site profiling and construction to ensure that protected habitats and species are not harmed during the process. The CEMP or ECMS should be secured by a suitably worded planning condition.

Occupation Phase

During the occupation phase of the development an Ecological Management Plan (EMP), to be integrated with arboricultural and landscape management requirements, would be developed to ensure the long term conservation of retained and new valued environmental resources, including habitats and species of ecological value. The EMP should be secured by a suitably worded planning condition.

It will be necessary for the EMP to be developed prior to the initiation of the construction phase and to identify the implementation responsibilities of the management plan.

The EMP will set out the objectives and principles covering the long term management of ecology interests. Monitoring of the effects of the implemented measures will form the basis for any revision of the scheme.

Habitats

The EMP will include measures to restore, maintain and enhance the hedgerows, scrub and trees within the site in order to increase their resilience and mitigate long term disturbance effects. In addition, the EMP will include measures to establish and maintain new habitats of long term ecological value within the development's open spaces. These measures are summarised below.

Hedgerows

- Retained hedgerows restored where relevant through selective trimming/laying and planting with native species in gaps;
- Planting an equivalent quantity of new native species-rich hedgerow within the development's open spaces to that which is being lost or sufficient compensatory habitat creation; and
- Existing hedgerows trimmed on a rotation to allow plants to develop flowers and fruit in order to enhance the wildlife value of the hedgerow.

Mature Trees and Woodland

- Ongoing viability and safety of tree stock on-site maintained including cyclic arboricultural inspections in accordance with industry best practice;
- New native tree and woodland planting within the project's open spaces; and
- Long-term management of the newly created woodland to promote species and structural diversity.

Grassland and Wetland

- Creation of attenuation ponds/SuDS, including permanently wet ponds designed to enhance opportunities for wildlife. These attenuation features would not only ensure the rate of surface water runoff from the project site matches current levels, but would also intercept pollutants. The EMP would detail suitable planting and management for the attenuation features, which would enhance their ecological value and effectiveness at intercepting pollutants; and
- Creation of marshy grassland within attenuation features and provision of meadow flower grassland subject to annual low level management to establish species diversity and enhance opportunities for protected species.

Watercourse

There are also opportunities to enhance Hall Brook as part of a riparian corridor, which would include:

- Removing existing culverts within the Hall Brook and replacing with a naturalised channel;
- Undertaking riparian planting to restore aquatic habitats;
- Planting new reedbeds;

- Modifying and protecting river banks with plants; and
- Managing the existing vegetation to maximise the riparian habitat potential.

Species

As described above, the EMP for the project would include measures to restore, maintain and/or enhance habitats of ecological value. These habitats are proposed to be created and maintained in appropriate locations that are accessible to wildlife and would therefore also benefit valued species occurring within and around the site through the provision of enhanced opportunities for breeding, refuge, foraging and/or dispersal. In general terms, these habitats should be sympathetically managed according to protected species interests as detailed within the EMP. Human related disturbance impacts should be addressed through the appropriate positioning and clear demarcation of recreational routes/public rights of way in addition to the use of strategic structural planting.

Additional species-specific measures to minimise operational impacts and provide enhanced opportunities for species breeding and refuge to be included within the EMP are detailed below.

Birds

- Durable bird boxes, including a range of designs to suit different species, would be erected on retained mature trees; and
- Bird nesting features (e.g. swallow/swift ledges and sparrow terraces) would be incorporated into selected new buildings within the project site.

Bats

- Durable bat boxes, including a range of designs to suit different species, would be erected on retained mature trees;
- Bat roosting features (e.g. bricks and access tiles) would be incorporated into selected new buildings; and
- A sensitive lighting scheme would be designed, which ensures retained and new bat habitats are not illuminated to a level where bat activity is deterred.

Other Species

- Inclusion of periodic gaps of >100 mm under close board fences separating residential gardens to allow for the movement of species (e.g. small mammals such as hedgehogs) across the development; and
- Management of retained and newly created habitats to also enhance opportunities for badgers, hedgehogs, water voles, amphibians and invertebrates.

Licensing

Given that there are European Protected Species (EPS) potentially using the site, certain works will need to be undertaken under an EPS disturbance and mitigation license issued by

Natural England to allow the works to continue. The license will only be granted if appropriate methods are applied to be followed and sufficient and appropriate mitigation is provided.

If a badger sett will be affected, then a license from Natural England will also be required to allow works to continue.

6.5.3 *Actionable Mitigation Measures*

No actionable mitigation is proposed.

6.6 **Assessment of Environmental Impacts**

6.6.1 *Impact Assessment*

Construction Phase

Off-site Local Wildlife Site (Ancient Woodland)

There is the potential that during the construction phase the Pikehorne Wood, Keresley Mere and The Alders LWS may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery resulting from adjacent construction works. However, the incorporation of the 15m development buffer and the provision of the clearly demarcated EPZs delivered through the ECMS would ensure that no significant effects arise.

Given the resilience of trees to dust deposition, their incorporation within EPZs and the implementation of the standard pollution controls set out within the CEMP, there is considered to be a negligible/low risk of potential indirect impacts arising from air pollution or dust during construction and therefore, effects are predicted to be **negligible**.

Semi-improved Neutral Grassland, Hedgerow, Watercourse, Ponds and Tree Network

Areas of the semi-improved neutral grassland will be lost to the development footprint, however areas will still be retained, and areas of retained other grasslands will be retained and enhanced to ensure that semi-improved neutral grassland of local value is maintained within the site. The loss of semi-improved grassland will result in a **negligible** effect.

The proposed development has been designed to incorporate the hedgerow network (including mature trees and linear trees) and minimise its fragmentation. However, some losses are unavoidable to allow for the construction of access roads, pedestrian crossings and cycle paths. Where possible, such losses have been limited to the poorer hedgerows or existing gaps in the hedgerow.

The loss and fragmentation is primarily associated with the main infrastructure routes. Further impacts on the retained hedgerow network are anticipated to be restricted to a limited number of smaller scale losses associated with the provision of pedestrian/cycle routes across the site and linking the project to the surrounding landscape.

Direct hedgerow and tree habitat loss and fragmentation would be mitigated and compensated for through the provision of new hedgerows and the provision of new woodland and structural planting, predominantly along the boundaries of the site. The direct and permanent loss and fragmentation of the existing locally valuable hedgerow and tree network is therefore only

considered to constitute an impact of low magnitude and the long-term significance of effect would be **negligible**.

The Hall Brook has been fully retained within the proposals and will be buffered from development. A minimum 20m buffer from the brook to built form has been incorporated into the development parameters to protect the brook, resulting in a **negligible** effect.

The proposed development has been designed to retain Pond 1 located along Hall Brook but the other three ponds onsite (P2-P4) are to be lost, resulting in a **minor adverse** effect. These ponds are of relatively new construction, are stocked with fish for fishing and have limited ecological value.

Provision of additional wetland habitats in the form of the attenuation and SuDS features will appropriately mitigate for their loss.

In addition to direct habitat loss and fragmentation, there is also a risk that during the construction phase retained hedgerows may be subject to indirect degradation impacts, such as soil compaction and encroachment by machinery resulting from adjacent construction works. However, the incorporation of the retained network within the clearly demarcated EPZs delivered through the ECMS would ensure that no significant effects arise.

Given the resilience of trees and hedgerows to air pollution and their incorporation within EPZs, there is considered to be a negligible/low risk of potential indirect impacts arising from air pollution or dust during construction and effects are therefore, anticipated to be **negligible**.

Further details on the implications of the proposed development on the existing tree stock are provided in *Appendix 8.5*.

Birds

In view of the inherent mitigation measures reflected in the retention and buffering of notable habitat features within the design layout, the loss and severance/fragmentation of potential bird nesting and foraging habitats during construction would primarily be restricted to relatively small losses of hedgerow, scrub and tree habitat. The loss of this habitat would result in the loss of breeding habitat for a small number of generalist bird species and potentially a small number of species of conservation concern. However, it is considered that, owing to the retention of the hedgerows in substantial green infrastructure corridors, these species are likely to continue to successfully breed within the site. Furthermore, the new habitats created would enhance opportunities for other more generalist species of conservation concern while the creation of attenuation features with associated wetland habitat would create opportunities for new species to breed on site. On balance therefore, it is considered that there would be no permanent significant effect on the locally valuable breeding bird assemblage as a result of direct habitat loss and severance/fragmentation.

Owing to their legal protection, it has been assumed that the avoidance of direct harm to birds at the nest (and their eggs and young), where vegetation clearance is required, constitutes standard mitigation implemented through the ECMS.

The standard mitigation measures, such as the inclusion of EPZs in the ECMS would ensure that the magnitude of indirect impacts from disturbance of retained nesting and foraging habitat through light spill, noise, visual and human disturbance would be low and the resulting temporary effect would be **minor adverse**.

Bats

The proposed development would not result in the loss of trees with bat roosting potential. However, if unexpected losses emerge through the detailed planning stage, including the need to remove U-grade trees with bat roosting potential on health and safety grounds, they would need to be investigated further to confirm the presence or absence of roosting bats. If trees with bat roosting potential require removal/surgery and are found to support bat roosts during pre-commencement investigations, such works would be subject to the EPS licensing regime. The licensing regime would ensure that appropriate precautionary felling techniques and replacement roost habitat would be implemented, which would ensure that no significant effects arise.

By virtue of the layout retaining and buffering key habitat features and corridors, such as the majority of the hedgerow and tree network (including the woodland edge and Hall Brook corridor) the potential loss and fragmentation of foraging and commuting habitat during construction has been significantly reduced. In addition, degradation impacts from adjacent construction works would be prevented through the use of EPZs delivered through the ECMS. However, the hedgerow network would be severed at points to facilitate the primary access route through the site. Such permanent impacts are considered to be of low magnitude, and would be mitigated and compensated in the longer term through the strengthening of green corridors and creation of new high-quality foraging and commuting habitat as part of the project. Effects are therefore, anticipated to be **negligible**.

Indirect disturbance of commuting, foraging and potential roosting habitat (e.g. light spill, visual and noise) could also potentially result from adjacent site works during construction. However, neither the rare bat species recorded (barbastelle) nor the most commonly recorded species (common pipistrelle) are considered to be particularly sensitive to lighting impacts (Stone, 2013). In light of this, together with the inherent buffering and protection afforded to retained habitat features (e.g. EPZs) and the restrictions on working hours delivered through the CEMP, the magnitude of such temporary impacts would be low and the resulting effect would be **negligible**.

Badgers

The annex sett would be retained and buffered from the construction works. The minimum buffer to the closest active holes within the hedgerow is approximately 20 meters (development to the south of the sett) and the setts would be protected from vehicular encroachment by the EPZs. In addition, site works would largely be restricted to daylight hours when badgers are inactive. It is therefore considered that the impact of directly killing, harming or indirectly disturbing badgers via lighting, noise and vibrations during construction both within their holes and when foraging on site is low.

Update surveys and the detailed design would determine whether the risk of such impacts arising warrants a detailed mitigation strategy and licence from Natural England for works to proceed. Owing to their legal protection, it has been assumed that the avoidance of direct harm or disturbance to badgers in their sett is considered to be standard mitigation and that this would ensure that effects are **negligible**.

Great Crested Newts

Specific measures for the protection of great crested newts during construction would be set out within the ECMS and will be subject to agreement with the EPS licensing process with

Natural England. Implementation of this mitigation and licensing requirements would ensure that potential effects are fully mitigated and are not significant, resulting in a **negligible** effect.

A summary of the receptors and potential effects during the construction phases is provided in *Table 6.6*.

Table 6.6 - Summary of Impact Assessment – Construction Phase						
Receptor	Sensitivity/ Importance/ Value	Description of Impact	Inherent & Standard Mitigation Measures	Nature of Effect	Type of Effect	Significance of Effect
Pikehorne Wood, Keresley Mere and The Alders LWS	County	Damage by encroachment and compaction from construction traffic; Dust deposition from construction activity	15m buffer from development; Implementation of EPZ through ECMS; Implementation of CEMP.	Negligible	Temporary and indirect	Negligible
Semi-Improved Neutral Grassland	Local	Loss of habitat	Provision of alternative habitats with similar or higher value within landscape masterplan; Retention of areas of semi-improved grassland within Green Infrastructure (GI) strategy	Low Adverse	Permanent direct impacts	Negligible
		Damage to retained	Provision of EPZ	Negligible	Temporary short term direct	Negligible
Hedgerow, Woodland and Tree Network	Local	Loss of habitat	Retention of maturity of hedgerows, GI strategy; Provision of alternative habitats with similar or higher value within landscape masterplan;	Low Adverse	Permanent direct impacts	Negligible
		Damage to retained	Provision of EPZ and CEMP	Negligible	Temporary short term direct.	Negligible

Ponds	Local	Loss of three low value ponds on site.	Provision of new aquatic habitats elsewhere within the GI strategy	Medium Adverse	Permanent direct impact	Minor adverse
		Potential pollution incident during construction.	Provision of EPZ and CEMP	Low Adverse	Temporary short term direct.	Negligible
Watercourse	Local	Potential pollution incident during construction.	Provision of EPZ and CEMP	Low Adverse	Temporary short term direct.	Negligible
Foraging and Commuting Bat Assemblage	Local	Loss and fragmentation of foraging and commuting habitat	Provision of EPZ, and provision of retained and enhanced new habitats for foraging and commuting bats	Low Adverse	Permanent indirect	Negligible
		Disturbance from light and noise during construction	Restrictions of timing of works through CEMP	Negligible	Temporary short term direct	Negligible
Roosting Bats	Local	Potential loss of tree roost	Retention where possible of mature trees; EPS Licensing system	Low Adverse	Permanent direct	Negligible
Breeding Birds	Local to District	Loss of habitat for breeding,	Provision of EPZ; provision of additional habitats within the GI strategy	Low Adverse	Permanent direct	Negligible
		Potential disturbance or destruction of nest during clearance and construction	Implementation of measures within the ECMS and CEMP	Low Adverse	Short term temporary indirect and direct	Minor adverse

Badger	Site	Potential disturbance or destruction of setts during clearance.	Pre commencement survey before site clearance as set out within the ECMS; License sett closure or disturbance if required.	Low Adverse	Permanent and temporary direct	Negligible
Great Crested Newts	Local	Loss of terrestrial habitat and potential physical harm during site clearance	Provision of EPZs, working methodology as set out within the ECMS and translocation under EPS license	Low Adverse	Short term temporary indirect and direct	Negligible

Occupation Phase

Off-site Local Wildlife Site (Ancient Woodland)

There is the potential that during the occupation phase that both recreational pressure within the Pikehorne Wood, Keresley Mere and The Alders LWS could increase and the increase of air-pollution from traffic could affect the habitats within the Woodlands due to increased deposition of nutrients.

The Pikehorne Wood, Keresley Mere and The Alders LWS currently has no public access so the risk of increased public access is greatly diminished, and impacts would only arise from trespass into the woodlands. This can be controlled by strengthening the boundary planting to prevent access and through appropriate fencing along the boundaries.

Implementation of this mitigation would ensure that potential effects are **negligible**.

Semi-improved Neutral Grassland, Hedgerow, Watercourse, Ponds and Tree Network

The locally valuable semi-improved neutral grassland, hedgerow, watercourse, pond and tree habitats, which would be retained within the project design, would be at risk of impacts during the lifetime of the project. These are summarised below:

- Disturbance from increased noise and light levels;
- Damage/incursion by the local residential population; and
- Deterioration through a lack of management.

The semi-improved neutral grassland, hedgerow and tree habitat is not considered to be highly sensitive to such impacts. Taking into account the inherent and standard mitigation, including the incorporation of such retained habitats within substantial green corridors, the provision of public rights of way and long term management delivered via an EMP, such impacts have been sufficiently avoided and mitigated to ensure that no significant effects would arise.

The watercourse and retained and created ponds will be monitored and protected within the EMP to ensure that no significant adverse impacts occur in the long term and management should provide enhancements to these habitats in the form of desilting, and reduction in over-shading.

Furthermore, given that the site currently comprises areas of species poor semi-improved, improved and amenity grassland of limited ecological value, it is considered that the areas of new woodland, meadow flower grassland and wetland habitats proposed, could potentially result in a **minor beneficial** effect on these habitats at a local level. This would contribute to a locally significant (minor) net gain in valuable habitats on site, as demonstrated by the biodiversity impact assessment calculations (*Appendix 6.2*).

Birds

Retained habitats supporting locally to district valuable breeding and foraging birds are potentially at risk of indirect disturbance and damage during the occupation phase of the project, and an increase in domestic cats and dogs in the vicinity would increase the risk of predation. Owing to the buffering afforded to such retained habitats within the prop and the

provision of new structural planting and public rights of way, the magnitude of impact is considered to be low and the resulting effect is not considered to be significant.

The establishment of new habitats across the site, including the erection of bird boxes, would present new and/or enhanced breeding and foraging opportunities for a variety of species. Such permanent impacts are likely to be of relatively low magnitude in the context of the loss of foraging/nesting arable resource during construction and any such effects are therefore only considered to be beneficial at a site level and therefore, **negligible**.

Bats

Residential development of the site could result in increased indirect light spill and disturbance impacts upon sensitive habitats used for foraging, commuting and potentially roosting by bats during the occupation phase of the project. However, these would be minimised through inherent buffering afforded to the main commuting, foraging and potential roosting habitat features - principally the hedgerow/tree network. Furthermore, neither the rare bat species recorded (barbastelle), nor the most commonly recorded species (common pipistrelle), are considered to be particularly sensitive to lighting impacts. The magnitude of such impacts on this feature of local to district value is therefore considered to be low. The significance of effect would be **negligible**.

Furthermore, it is considered that once the new habitats and green corridors are established, in addition to the provision of bat roosting boxes, the increase on foraging, commuting and roosting resource delivered by the project could potentially result in a permanent **minor beneficial** effect on bats at a local level.

Badger

Badgers would be likely to be at risk of collisions with cars and disturbance by humans and dogs associated with the new residential development. The annex sett currently lies within dense woodland and would be screened through planting from direct impacts from recreation. Recognising that new opportunities for foraging, dispersal and sett building would be delivered through the design layout and this species ability to successfully adapt to, and inhabit, urban areas, combined with the species value, such permanent but reversible low magnitude adverse impacts are considered to be **negligible**.

A summary of the receptors and potential effects during the occupation phases is provided below in *Table 6.7*.

Table 6.7 - Summary of Impact Assessment – Occupation Phase						
Receptor	Sensitivity/ Importance/ Value	Description of Impact	Inherent & Standard Mitigation Measures	Nature of Effect	Type of Effect	Significance of Effect
Pikehorne Wood, Keresley Mere and The Alders LWS	County	Increased recreational activity damaging ground flora; Air quality impacts from increased traffic	No public access to woods. GI strategy and EMP to maintain boundary to prevent un authorised access; Air quality mitigated through boundary planting	Negligible	Temporary and indirect	Negligible
Retained and Created Habitats	Local	Recreational Impacts	Provision of GI strategy and monitoring in EMP	Medium Beneficial	Permanent long term direct	Minor Beneficial
		Deterioration of habitats through lack of management.	Implementation of EMP	Medium Beneficial	Permanent long term direct	Minor Beneficial
Breeding Birds	Local to District	Disturbance to Nesting birds; increased predation; and provision of alternative nesting habitat	Provision GI strategy; Provision of additional landscape planting; Provision of artificial nest boxes	Low Adverse and Low Beneficial	Permanent direct	Negligible
Foraging and Commuting Bat Assemblage	Local	Light spill affecting commuting and foraging	Provision of buffers from important features within GI strategy; Provision of sensitive lighting strategy limiting light spill	Low Adverse	Permanent indirect	Negligible
Roosting Bats	Local	Alternative roosting provision	Inclusion of roosting features within new buildings and provision of artificial roosting boxes	Medium beneficial	Permeant direct	Minor Beneficial

Badger	Site	Potential disturbance to individual badgers from increase in recreation pressure	Provision of additional planting around known retained sett within landscape strategy to provide over	Low Adverse	Permanent direct	Negligible
		Increased traffic mortality	Implementation of EMP and monitoring	Low Adverse	Permanent direct	Negligible

6.6.2 Residual Impact Assessment

As no actionable mitigation measures are proposed, the residual effects are as set out in *Section 6.6.1*.

6.7 Cumulative Impact Assessment

The assessment of the project concludes that, through the adoption of appropriate mitigation measures, the project would not give rise to significant adverse effects on ecology. However, this does not exclude the potential for insignificant effects to become significant in combination with other consented/proposed developments and associated infrastructure within the surrounding landscape, on sensitive habitats, fauna and flora.

Cumulative effects generally occur where there may be simultaneous or prolonged similar effects on the same habitats or species populations as a result of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified.

For this proposal, the wider allocation of the Keresley SUE, of which these proposals form part of, including the consented Lioncourt development, are considered to potentially give rise to cumulative development impacts (see *Figure 4.4*).

There will be further habitat losses and impacts to species that have been identified as IEFs as a result of the wider Keresley SUE and therefore, the cumulative effects could be significant. However, the Biodiversity Impact Assessment calculations (see *Appendix 6.2*) would also be required for the other areas of the Keresley SUE and would also need to demonstrate a net gain in biodiversity either through on-site retention, enhancement or provision, or through off-site provision or contribution. This would ensure that overall there should be an enhancement to habitats across the entire SUE or at least no change.

Planning applications for the additional SUE areas would be expected to implement the similar mitigation and enhancement measures. These should ensure that for each development coming forward within the wider SUE the species and habitats present within the site and other sites will be protected during construction and suitably provided for through the occupation of the developments.

If these measures were to be followed it is concluded that there would be no significant adverse cumulative effects as a result of the wider Keresley SUE.

6.8 Summary

This chapter provides an assessment of potential ecological impacts upon identified IEFs arising from the proposed development.

Mitigation measures have been proposed as part of a holistic ecological strategy for the development to address potential significant effects that may arise during construction and after completion (occupation).

Further baseline information in support of this chapter is included within the Ecological Baseline Report (*Appendix 6.1*) and is referred to throughout the assessment. The approach taken in this assessment is made with reference to the guidelines published in 2018 by CIEEM.

The baseline survey work has identified the following IEFs pertinent to the project:

- Pikehorne Wood, Keresley Mere and The Alders LWS (county importance);
- Semi-improved neutral grassland, hedgerow, watercourse, pond and tree network (local importance);
- Breeding birds (local to district importance);
- Foraging commuting and roosting bats (local importance);
- Badger (site importance); and
- Great crested Newts (local importance).

Inherent avoidance and mitigation measures as part of the project's design and the implementation of a CEMP, ECMS and EMP are considered capable of ensuring that no adverse effects of greater than **minor adverse** significance are likely during the construction and occupation stages. There will also be some **minor beneficial** effects with respect to biodiversity gain through habitat enhancement and new roosting features for bats.