



LAND EAST OF THE COMMON, BARWELL

ECOLOGICAL SURVEY & ASSESSMENT

PCAJ199/V2

Submitted to:

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SUMMARY

The ecological survey and assessment has been completed to inform residential development plans for an area of land to the east of the Common and south of Dawson's Lane, Barwell. The site was subject to previous surveys in 2017 and 2021 to inform unrelated planning applications. Whilst drawing on the historic survey information, this assessment was based upon a fully updated survey.

The site and its surrounds are not subject to any statutory nature conservation designations. The closest sites are Burbage Woods and Aston Firs Site of Special Scientific Interest (SSSI) which is approximately 1.7km south of the site. This is located within a larger area, known as Burbage Common and Woods that is also a designated Local Nature Reserve (LNR). The LNR is approximately 700m distant at its closest point.

Regarding not-statutory sites, following on from the 2017 ecological survey, hedgerows that were assessed as being important have been identified as a candidate Local Wildlife Site. This relates to five hedgerows, equating to 740m in total. Four Ash trees within the site have also been identified as a candidate Local Wildlife Site. These hedgerows and trees are retained as part of the development. Following the 2021 survey, one of the Fields (Field 5) was found to meet the LWS criteria for mesotrophic grassland. In the immediate wider local area, the two fields immediately south of the site and Leicester Road (SP451961) is a candidate LWS, meeting the criteria for mesotrophic grasslands. The field which borders the site on its southern side is a historic LWS. This refers to sites which were designated in the 1980s-90s but for which there is no recent data.

The site comprises of ten pasture fields bounded by a series of largely unmanaged hedgerows. These fields are best described as semi-improved neutral grassland. They all display evidence of historic improvement for agriculture and in more recent times are subject to different levels of horse grazing. Despite evidence of agricultural improvement throughout, certain fields are more species-rich and support a range of less common meadow species. These include species such as Great Burnet, Oval Sedge, Pepper-saxifrage, Pignut, Tormetil and Yellow-rattle. Field 5 is the most diverse and with ten indicator species used in LWS selection qualifies a LWS. Field 10, with nine such species is one species off achieving the LWS threshold. An eleventh field is immediately to the south and whilst outside of the application site will be used for biodiversity enhancement. It is currently species-poor semi-improved grassland.

Fields are bordered by hedgerows and field boundaries. There are twenty such hedgerows/field boundaries across the site. They are typically unmanaged and have dense bands of associated scrub. Whilst the diversity of individual boundaries varies significantly, in their entirety they support a diverse range of woody species. Twenty-six trees and shrubs were recorded across the site. Three boundaries were identified as important when assessed using the ecological criteria as set out in the Hedgerows Regulations 1997.

A limited range of other habitats are present across the site, for example, patches of ruderals, Bramble scrub and Blackthorn scrub.

Breeding bird surveys recorded a typical range of species. Whilst supporting typically common species, the structural quality of the hedgerow/boundary network along with added presence of mature trees was such that the variety of species and numbers of individual territories was relatively high. This indicates a habitat of high local value.

Bat activity surveys yielded a limited number of species with Common Pipistrelle representing in excess of 91% of all records. Noctule (8%) was the only other species recorded in any numbers. Other species that were recorded very rarely were Soprano Pipistrelle, Nathusius' Pipistrelle and Leisler's. Whilst bats were recorded along the majority of boundaries at times, the western boundary was found to be a commuting corridor in the early dusk period. This was also noted in 2021 when it was thought that a roost site was likely to be present in the adjacent housing estate or industrial units. This was subsequently confirmed in 2023 with an estimated 12 Common Pipistrelles observed emerging from a roost site in the industrial estate to the west of the application site. Regarding roosting in the application site, whilst dawn and dusk observations of trees found no confirmed evidence of roosting bats, a single Common Pipistrelle was observed in the early dawn period on one occasion close to trees along the southern boundary of the developed area. Whilst the light was too poor to observe precisely what this bat did, it seems likely that it was probably roosting in one of the trees on this boundary. There was no evidence of roosting in any of the small number of animal shelters and storage buildings that are present on the site.

Whilst there are no ponds within the site, two large ponds are present approximately 110m east of the site. These ponds were previously surveyed using eDNA analysis as part of the 2017 EcIA. This yielded negative results. They were visited as part of the 2021 survey and both were found to be heavily stocked with coarse fish and used as commercial angling ponds. Given this usage there is no realistic prospect of them supporting Great Crested Newt.

In terms of the site design, biodiversity enhancement has been a key consideration from the outset. As such, the development is concentrated in the northern part of the application site (Fields 1, 2, 3, 4, 5 and the north-west quarter of Field 6 which will also be used for the main site entrance and access road. With the exception of a proposed public footpath and some areas of woodland screen planting, Fields 8-10 are not directly impacted and would be retained. This is also the case with part of Field 7. Biodiversity enhancement is a key objective in this retained land. Impacts to boundaries will be associated with the removal of sections of boundaries 18 and 19 to facilitate access roads and the removal of 52m of the roadside hedgerow 17 to facilitate the main access to the site of 'The Common'. All other boundaries and all mature trees will be retained.

Within the retained areas, targeted habitat enhancement measures will be particularly associated with grassland restoration and enhancement. The key objective will be to establish these fields as examples of the lowland meadow priority habitat type. There will also be some areas of woodland and scrub screen planting that will also provide a different habitat type in the long-term. Retained boundaries will also be subject to immediate restoration in the form of restocking, coppicing etc. in combination with

long-term management on a long rotation. These measures are entirely consistent with the historic habitats that would have once been present here prior to agricultural intensification.

The proposal has been tested using the Natural England biodiversity Metric 4.0. Whilst only at the outline stage, with the commitment to retain and reinstate three on site and an adjacent offsite field to lowland meadow represents an important habitat enhancement. From a current baseline of 53.06 habitat units, this approach would deliver 58.75 on-site and 11.65 adjacent post development units. This equates to net biodiversity gain of 23.55%. Clearly, as the detailed elements of any application progress, there may be other aspects of the design which impact on this score. As a precautionary approach has been adopted, this should be an increase in score, for example, as more detail about the main urban design evolves. Following this initial calculation, biodiversity Metric 4.0 should therefore continue to be used to test the more detailed design of the site. It is clear, however, that this design should continue to target lowland meadows as the priority habitat for the retained pastures. With hedgerows also being largely retained and subject to appropriate long-term management, this also delivers a significant improvement. The current hedges on site deliver 24.55 units. This will increase to 29.78 units in the long-term which equates to a net gain of 21.27%.

1.0 INTRODUCTION

Paul Chester & Associates Ltd. (PCA) was commissioned by Harrow Estates plc to undertake an Ecological Survey and Assessment for an area of land located to the south of Dawson's Lane, Shifnal, Leicestershire (NGR SP 451 965). A site location plan is provided as Figure 1. The site which covers an area of approximately 10.92 hectares will be subject to a planning application for future residential development.

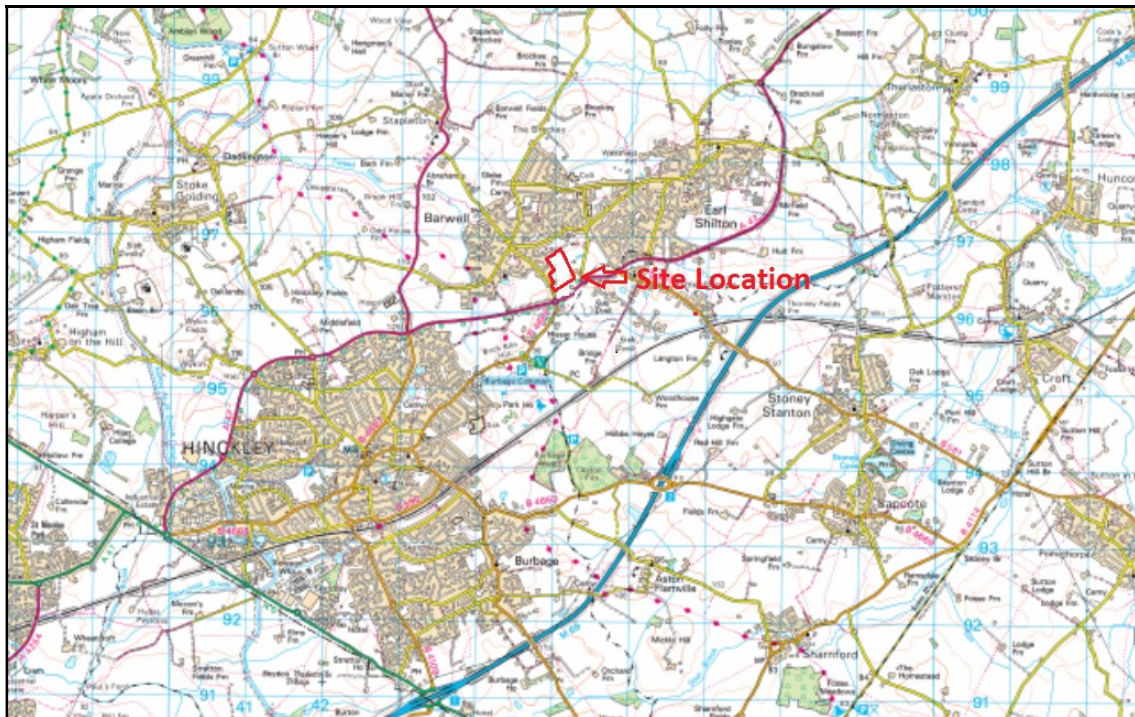


Figure 1: Site Location

The site comprises of ten pasture fields with associated field boundary hedgerows. It borders Dawson's Lane on its northern side, farmland on its southern side, partly farmland, 'The Common' and Dawsons Lane Industrial Estate on its western side and partly allotments and a small holding on its west side. Whilst outside the application boundary, an eleventh field that borders the site on its southern side is included as part of the wider biodiversity enhancement plan. This borders the A47 on its southern side.

2.0 ECOLOGICAL SURVEY METHODOLOGY

2.1 Introduction

The final scope of the ecological survey was defined on the basis of known and potential ecological interest in the local area. This was defined on the basis of a desk-based search as well as professional knowledge of the local area. With the exception of small field in the north-west of the application site, the same study area was also subject to a detailed EclA in 2017 (FPCR Environment and Design Ltd., 2017) and 2021 (PCA Ltd., 2021/22), the results of which were also used in defining the survey scope.

2.2 Personnel

The field survey and EclA report was completed by Mr Paul Chester, Managing Director of PCA Ltd. Mr Chester is an ecologist with thirty years professional experience. He has been a member of the Chartered Institute of Ecology and Environmental Management (CIEEM) since 1995. He has extensive experience in the ecological survey and assessment of sites such as this and of the survey and assessment of a comprehensive range of habitats and species. Mr Chester was responsible for all surveys completed to inform the 2022 planning application. Mr Chester was supported by PCA associates, as required.

2.3 Ecological Survey Requirements

The final scope of the Ecological Survey was defined on the basis of known and potential ecological interest in the local area and giving due consideration to potential ecological impacts associated with residential development proposals. The following were identified as essential survey requirements:

- Habitats and Plants
- Breeding Birds
- Bats
- Badger
- Great Crested Newt (habitat-based assessment/review of recent survey locally)

In addition, during the course of the surveys, consideration was given to other potentially important species/species-groups, for example, Brown Hare and Hedgehog.

2.4 Study Area

In terms of the extent of the study area, the desk-based elements of the survey extended up to approximately 2km from the proposed site, with a wider area of search applied to key possible considerations such as nationally and/or internationally protected sites.

With regard to the survey area adopted for the more detailed surveys, this was defined on the basis of each individual survey requirement and particularly the potential zone of influence relevant to any potential adverse impact. For certain sedentary species, the study area was therefore largely restricted to the proposed development area whilst for other surveys it was extended into the wider local area.

2.5 Methodology

2.5.1 Desk Study & Data Search

The desk-based study involved the consideration of published documents and other information relevant to the local area. All relevant information within 2km of the site was obtained from the Leicestershire and Rutland Environmental Records Centre as part of the 2021 planning application. Given the recent nature of this search along with the detailed site-specific surveys available from the 2021/22 survey, this was not repeated. Key sources of information reviewed as part of the desk study include, in particular:

- Ecological Impact Assessment completed for virtually the same site in 2021/22
- Ecological Impact Assessment completed for virtually the same site in 2017
- Recent Planning Applications in the Local Area
- Magic Map.
- Botanical Society for Britain and Ireland distribution maps
- Local and regional distribution atlases

2.5.2 Habitats/Plants

The habitat survey was based upon a Phase 1 Habitat Survey to identify broad habitat types. In addition, more detailed surveys were completed of individual habitat features across the site. The location of fields and hedgerows is shown on Figure 2.

In relation to the fields this involved compiling a species list with a measure of abundance of each species provided using DAFOR i.e., D – Dominant (75–100% cover), A – Abundant (25–74% cover), F – Frequent (10–24% cover), O – Occasional (5–9% cover), and R – Rare (<5% cover). Hedgerows were surveyed in accordance with the ecological criteria set out in Hedgerows Regulations 1997. Given also the requirement to complete a Biodiversity Net Gain (BNG) assessment in accordance with biodiversity metric 4.0, data was gathered that was consistent with the habitat condition assessment requirements of the metric, for example, the average number of species in a 1m² sample in fields. A botanical species list is provided in Appendix 1. Appendix 2 provides species lists for individual fields, Appendix 3 provides details of hedgerows and Appendices 5A-5D provides a photographic record of the site. Consideration of the presence of invasive species was also included.

2.5.3 Breeding Birds

The breeding bird survey broadly followed the original methodology of the Common Bird Census (CBC) (Marchant, 1983), albeit was based upon four detailed surveys repeated across the breeding season. In order to ensure that fieldwork was carried out during times of optimum activity, surveys were completed in the mornings, commencing within an hour of sunrise and continuing through to late morning. In addition, night visits were made to record the presence of nocturnal species. The surveys were completed during optimum survey conditions and days with rain or winds in excess of Beaufort force 4 were avoided wherever possible.

All bird species were noted either by sight or call and were recorded onto maps to enable an assessment of the importance of the site to be made, not only in terms of the range of species present, but also in terms of the significance of the populations of individual species.

Birds were deemed to be holding territory if they were observed to be displaying any behaviour indicative of breeding. Specifically, this included the following behaviour:

- Birds observed singing, displaying or in courtship
- Birds engaged in territorial behaviour/territorial dispute.
- Birds seen carrying nest material.
- Adult visiting a probable nest site.
- An active nest site.
- An adult bird seen carrying food to nearby nest or young.
- Bird removing faecal sac from nearby nest.

For those species where breeding behaviour can be difficult to observe, the presence of a pair was deemed to represent a territory. For such species, it is, however, clearly possible that breeding may be some distance from the observation. This approach does, however, enable a precautionary approach to be followed in the survey and assessment. Birds of note not exhibiting breeding behaviour are recorded onto maps in brackets.

Three repeat full surveys were completed between early-June and late-July with adventitious records made during the course of other surveys.

Breeding bird records are shown on Appendix 4.

2.5.4 Badger

A detailed Badger *Meles meles* survey was undertaken. This involved an initial walkover survey to identify sett locations, together with other field signs present such as paths, hairs, footprints, latrines, etc. Where field signs were encountered these were investigated further subject to access, particularly with respect to establishing the location of any main setts.

2.5.5 Bats

Whilst no mature trees are directly impacted by the proposal, several were present in adjacent boundaries. Their roost potential was assessed on the basis of the presence of features typically associated with tree roosting bats, for example, woodpecker holes, trunk and branch splits, rot holes (cavities) where branches have been removed, frost cracks, hollow sections of trunk, branches or even roots, cavities beneath old root buttresses, beneath loose bark, behind dense Common Ivy, in dense epicormic growth and in bat or bird boxes. With regard to trees favoured by roosting bats, a number of general principles were used in the assessment; in particular, tree species usually favoured by roosting bats are Ash, Beech, Elm, Oak, Scots Pine and Willow. Trees of less than 30cm diameter and less than 80 years old are least likely to contain roosts and trees greater than 50cm diameter and more than 120 years old are most likely to contain roosts.

Whilst buildings within the application site were limited to a small number of animal shelters, they were subject to an assessment of their potential suitability to support roosting bats as well as to seek to confirm such usage. Particular attention was paid to the possible presence of voids and possible entry/exit points to these. Specific searches were made for bat droppings that can indicate present or past use and extent of use, as well as other signs to indicate the possible presence of bats, e.g., feeding remains, presence of stained areas, or areas that are cobweb free.

During the period June to September 2023, three emergence/dawn re-entry surveys were completed at trees considered to offer roosting potential. Surveyors carried out the surveys by direct visual observations in combination with Echo Meter Touch 2 Pro bat detectors. This survey method aimed to identify any roosting bats leaving the trees in the evening or returning in the morning.

In addition, bat activity surveys were conducted throughout the application site in this period. The activity surveys involved surveyors walking pre-determined transects such that the entire site and immediate surrounds were covered during each survey. Echo Meter Touch 2 Pro bat detectors were used in this survey. Three repeat surveys were completed in June, July and September 2023.

2.5.6 Amphibians (Great Crested Newt)

Whilst there are no ponds within the application site, two are present in the wider local area to the east. These were subject to eDNA analysis in 2017 as part of a previous survey with this yielding negative results. These ponds were visited as part of the 2021 survey and were found to be commercial fishing ponds supporting large fish populations. With no prospect of supporting Great Crested Newt in their current state, no additional surveys were completed. The results of the 2021 site assessment are, however, included for information purposes.

2.5.7 Other Species

Other species were typically recorded adventitiously during the course of other surveys.

2.6 **Schedule of Survey Visits**

The following table provides a summary of the schedule of survey visits.

Dates	Survey
3 rd June 2023	Updated Walkover, Phase 1, Badger, Breeding Birds etc., Bats (tree roosts assessment)
30 th June & 1 st July 2023	Detailed Botanical, Breeding Birds, Bats (tree roost observations/activity survey)
27 th & 28 th July 2023	Detailed Botanical, Breeding Birds, Bats (tree roost observations/activity survey)
28 th and 29 th September 2023	Bats (tree roost observations/activity survey), review of previous surveys, other observations.

2.7 Survey Constraints

Whilst there were not considered to be any significant constraints, early June is quite late to be starting a breeding bird survey. Later survey visits do, however, offer the advantage of often being able to confirm successful breeding. Importantly, this site also has the 2021 survey results to draw upon, as required. A precautionary approach has been followed throughout particularly with regard to any early nesting species that were observed in 2021 but not 2022. In reality, however, the results of both surveys yielded very similar results.

3.0 APPROACH TO THE ECOLOGICAL IMPACT ASSESSMENT

3.1 Introduction

Following on from the establishment of the baseline ecological conditions, the ecological impacts are identified and assessed in line with guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM). This involves an initial process of evaluation, followed by a process of impact identification and assessment. The methodology and approach that has been followed in this assessment is described further below.

3.2 Evaluation

3.2.1 Introduction

Ecological value is established on the basis of the importance of the identified habitats and species. Importance relates to the overall importance of a species or habitat and forms the basis for establishing the value of a discrete population of a particular species or discrete habitat. There are many factors which contribute to such value including extent, naturalness, rarity, fragility and diversity. These along with other established criteria have been applied throughout the evaluation process.

3.2.2 Geographical Context

An important element of the Ecological Impact Assessment process is that of establishing the value of a particular species or habitat within set geographical parameters. Those that have been used in the assessment are typically as follows:

- International (Europe)
- National (United Kingdom)
- Regional (East Midlands)
- County (Leicestershire)
- District (Hinckley and Bosworth Borough Council)
- Local (Barwell and surrounds)
- Site, i.e., within zone of influence only

In relation to the above, there is typically some overlap between these parameters. In this context there may be some overlap in terms of the geographical context of published documents, for example, Local Biodiversity Action Plans. Likewise, for certain species, published data may refer only to the County/Vice-county with no specific data available for the relevant district.

When considering the geographical context of an individual species or habitat, the larger geographical threshold is always taken as the most important.

3.2.3 Ecological Value

Following on from the above, attributing value to designated sites is more straightforward, for example, Special Protection Area's and Special Areas of Conservation are of international

significance; Sites of Special Scientific Interest of national significance and non-statutory sites are typically of significance in the context of the County or district.

Outside designated sites, factors such as extent, naturalness, rarity, fragility and diversity are considered and used alongside other published resources to establish ecological value.

Whilst clearly, the presence of a protected site or species is of fundamental importance to the EcIA, it is also important to identify those habitats and species which are of significance in the local or site-specific context. For example, whilst the presence of a mature oak tree would not infer any particular value in its own right, within the site-specific context it may be a rare feature and therefore of value. The identification of such features and species which are of value in the site context is therefore important and enables best practice to be followed in the detailed design of an individual proposal.

Consideration of the relative sensitivity of an individual ecological receptor has also been considered and is based upon a number of factors including the extent of a particular habitat or the size of population of an individual species. Other factors include the fragility of the habitat or species both in terms of its susceptibility to disturbance and its ability to recover following such disturbance.

The following table provides a summary of the approach to evaluation that has been followed in this assessment:

Individual Species	Criteria
International Importance	- Habitats Directive Annex IV Species - Internationally important populations of individual species - Globally threatened species (as defined by the IUCN) - Species with an unfavourable conservation status in Europe
National Importance	- Birds protected under Schedule 1, Fauna protected under Sch 5 and plants protected under Sch 8 of the Wildlife and Countryside Act - Nationally Rare species (typically occurring in <15 10km grid squares) - Nationally important populations of individual species (e.g., for birds, typically >1% of GB population) - NERC S41 Species of Principal Importance for which the relevant action plan recommends the safeguard of all sites - NERC S41 Species of Principal Importance for which surveys have identified a large population in the study area - British Trust for Ornithology (BTO) Red List species for which surveys suggest a large population in the UK context - Species which have a highly restricted distribution in England
Regional Importance	- Nationally Scarce Species (typically occurring in 16-100 10km grid squares) - Species which have a highly restricted distribution in the relevant Natural Area, i.e., Leicestershire Vales

	• NERC S41 Species of Principal Importance for which surveys suggest a large population in the regional context • BTO Red List species for which surveys suggest a particularly large population in the regional context
County Importance	• Species which are recognised as having a restricted population in Vice County 55 Leicestershire • Local BAP priority species for which the relevant Species Action Plan (SAP) recommends the safeguard of all sites • Local BAP priority species for which the relevant SAP recommends the safeguard of all populations above a defined threshold • BTO Red List species for which surveys suggest a particularly large population in the County context
District Importance	• Species which are recognised as having a restricted population within Hinckley and Bosworth Borough Council area
Local Importance	• Occurrence of NERC S41 Species of Principal Importance, Local BAP, BTO Red or Amber List or other declining species which nevertheless remain relatively common • Occurrence of NERC S41 Species of Principal Importance/Local BAP species for which the protection of all sites is not a SAP priority • Other species which have a restricted distribution in the Barwell Town Council area and immediate surrounds
Site Importance	• Occurrence of a NERC S41 Species of Principal Importance, Red or Amber List or other declining species but typically in low numbers (e.g., a single pair of breeding birds in a hedgerow potentially impacted by proposed development) • Individual site features, for example, a mature oak tree
Habitats	
International Importance	• Special Protection Areas (SPA's) • Special Areas of Conservation (SAC's) • A viable area of habitat as listed in Annex 1 of the Habitat Directive • Habitats which regularly support internationally important numbers of individual species.
National Importance	• Sites of Special Scientific Interest • Any viable habitat in favourable condition which meets the published criteria for SSSI designation • A viable area of a NERC S41 Habitat of Principal Importance which is in favourable condition • Habitats which regularly support nationally important numbers of individual species.
Regional Importance	• Sites which exceed the criteria for County/District wildlife designations which do not meet the criteria for SSSI designation

	- Any viable habitat in favourable condition which is identified as being rare in the relevant Natural Area - Local Nature Reserves (depending on habitats and species) - Ancient Woodlands (of semi-natural origin) which are extensive and in favourable condition
County Importance	- Local Nature Reserves (depending on habitats and species) - Designated County Wildlife Sites - Any site which meets the criteria for a County Wildlife Site designation (Local Wildlife Site, Local Nature Reserve, etc.) - A viable area of a Local BAP priority habitat which is in favourable condition - Ancient Woodlands (of semi-natural origin) – all other - Ancient Woodlands (of plantation origin) which are extensive and in favourable condition
District Importance	- Local Nature Reserves (depending on habitats and species) - Wildlife Sites designated by the relevant Unitary Authority - Any non-designated site which meets the designation criteria - A viable area of a Local BAP priority habitat which is in favourable condition - Ancient Woodlands (of plantation origin) – all other
Local Importance	- Examples of NERC S41 Habitats of Principal Importance or Local BAP priority habitat types which may not necessarily be viable or in favourable condition - Other habitats which have been identified through survey as providing a habitat of local importance to rare or declining species, e.g., LBAP species, BTO Red/Amber List, etc.
Site Importance	Habitats/features which increase opportunities for biodiversity within the site and its immediate surrounds

The above table is not exhaustive and where relevant, habitats and species are considered on an individual basis.

3.3 Identification and Assessment of Ecological Impacts

3.3.1 Identification of Ecological Impacts

Utilising the established baseline conditions, potential impacts are systematically described for both habitats and species. When describing changes/activities and impacts on ecosystem structure and function, reference is made to the parameters referred to in CIEEM guidelines. These are:

- positive or negative
- magnitude
- extent
- duration
- reversibility
- timing and frequency

With regard to the above, positive impacts merit just as much consideration as negative ones and are becoming increasingly important as development projects are pressed to deliver positive biodiversity outcomes. Magnitude refers to the scale of impact described in quantitative terms wherever possible. Extent refers to the areas over which the identified impact occurs. Duration refers to the time period over which the identified impact is expected to be relevant prior to the recovery of the impacted habitat or species. In many cases the duration of an impacting activity will differ from the resulting impact caused by that activity. Reversibility essentially refers to whether or not an impact is irreversible (permanent) or if it is reversible (temporary). With regard to the definition of reversible, it is important to establish what would be a reasonable time-frame for an impact to be addressed and this is something which may vary according to the relative importance of an individual habitat or species. Finally, timing and frequency refer to specific impacts which may only be significant if the impacting activity coincides with particularly sensitive phases of a species life-cycle or which may only become significant where the frequency of a particular activity reaches a critical threshold.

Whether a potential impact is significant is determined by quantifying the magnitude of effect of the identified impact on each of the identified ecological receptors. Large scale effects on receptors of high or very high sensitivity and value are likely to represent a significant impact that may be unacceptable in nature conservation terms. Equally, small-scale effects on receptors of low or very low degrees of sensitivity are likely to be below significance thresholds and thereby not a significant constraint to the proposed development.

3.3.2 Assessment of Ecological Impacts

Following on from the identification of actual or potential ecological impacts the significance of the individual or in-combination impacts is assessed. The terminology used in the assessment is as follows:

- Adverse – Where there would be a negative impact on the individual species, species-group or habitat.
- Beneficial – Where there would be a positive impact on the individual species, species-group or habitat.

These simple assessment criteria are further sub-divided to consider the magnitude of an impact as follows:

- Major – Where the identified impact would result in a large-scale change from the established baseline conditions. In relation to adverse impacts, this could include the loss of the integrity or function of an identified habitat, the loss of a species or a species-group. Such impacts could also include changes to habitats which are likely to result in such habitats being unable to sustain populations of important species at current levels. Conversely, where such impacts are beneficial, this could relate to opportunities that have arisen as a result of the proposal to restore important although degraded habitats to a favourable condition, thereby establishing a positive change to the local environment of value to both the habitat as well as species utilising that habitat. Such positive impacts are typically

classified as substantial where they relate to clear benefits to a habitat or species/species group of importance, for example, a UK or Local BAP priority habitat or species.

- **Moderate** – Where the identified adverse impact would result in changes to the established baseline conditions but where such change is unlikely to result in the loss of the integrity or function of an identified habitat or the complete loss of a species or a species-group to a level which would affect its viability locally. Conversely, moderately beneficial impacts are essentially defined on the same basis as for substantial described above, albeit they are related to those situations where the positive outcome is related to a less important habitat or species/group or where the benefits to habitat or species/species group of importance is less marked.
- **Minor** – Minor impacts are where neither of the above applies but where there would be some identified change (either adverse or beneficial) as a result of the proposal.
- **No impact** – Where the proposal would have no impact on the identified habitat, species or species-group.

These impacts are considered further in relation to their duration. These are essentially temporary or permanent. Within the definition of temporary, the time-scale is considered further in the relevant sections of the report. This is largely based upon professional experience of the likely duration of an identified impact based upon similar scenarios from other projects. The time-scale over which a temporary impact is of significance is a factor of value. For example, a potentially adverse temporary impact on an internationally designated site could only ever be considered as acceptable over a short time-frame. Conversely, an adverse impact on a typical habitat feature such as a hedgerow would be acceptable over a longer time-frame.

3.3.3 Defining Significance

Establishing the significance of an identified ecological impact is based upon the consideration of the identified ecological impact alongside the value of the impacted habitat, species or species-group. Whilst this is not necessarily straightforward, it is summarised in simple terms in the table below:

Value/Importance	Magnitude		
	Major	Moderate	Minor
International	Very High	High	Moderate
National	Very High	High	Moderate
Regional	Very High/High	High/Moderate	Moderate/Low
County	High	Moderate	Low
District	High	Moderate	Low
Local	High/Moderate	Low	Very Low

The lowest category of value/importance used in the assessment, i.e., “site” has been deliberately excluded from the table. This is because these are impacts which are best treated on a site-specific basis, particularly when considering requirements for mitigation.

3.3.4 Impact Significance and Mitigation Requirements

This element of the assessment process is based upon the consideration of the established ecological value and magnitude of the identified impact also taking into consideration the duration of the impact, where relevant. Given the complexity of ecological processes, together with relevant legislation and policy guidance, this is not always straightforward.

3.3.5 Biodiversity Enhancement

Outside of the requirements for specific ecological mitigation, the delivery of biodiversity enhancement as part of development proposals is now accepted best practice. Subject to the adoption the emerging Environment Bill as UK law, this will become something which forms a mandatory aspect of development. A key element of the assessment is therefore to consider net biodiversity gain.

3.3.6 Residual Impact Assessment

Following through the ecological impact assessment process, the final element of the process is the re-assessment of the identified significant ecological impacts with any proposed mitigation in place. This element of the assessment describes the impacts under the same basis as the earlier assessment. As an outline planning application some assumptions are made in this assessment.

4.0 LEGISLATIVE & POLICY CONSIDERATIONS

4.1 Legislation

The Wildlife and Countryside Act (1981, as amended) provides protection for Britain's flora and fauna. Particular protection is afforded to certain species listed in schedules to the Act although the degree and nature of the protection varies. Schedule 1 of the Wildlife and Countryside Act (Part 4) lists birds which are afforded special protection. This protection is greater than for other birds and includes it being an offence to disturb a bird whilst it is building a nest or is in, on, or near a nest containing eggs or young. It is also an offence to disturb the dependent young of a Schedule 1 species. Schedule 5 lists animals which are afforded special protection. Relevant to development plans, this schedule makes it an offence to damage, destroy or obstruct access to any structure or place which any Schedule 5 animal inhabits. It is also an offence to disturb any such animal while it is occupying a structure or place which it uses for that purpose. For certain species, different levels of protection are afforded. Schedule 8 lists species of plants which are afforded special protection.

Other national legislation includes the Natural Environment and Rural Communities Act 2006 which was developed primarily to implement key aspects of the Government's Rural Strategy published in July 2004. Specific to biodiversity conservation, Section 40 extends to all public authorities the duty to have regard to biodiversity as far as is consistent with the proper exercise of their functions. Section 41 places a duty on the Government to publish, review and revise lists of living organisms and types of habitat in England that are of principal importance for the purpose of conserving biodiversity.

The Environment Act 2021 introduces important changes to how biodiversity is considered in development plans. Specific to this, the Act introduces a requirement to deliver a minimum 10% biodiversity net gain (BNG) on virtually every project. It also establishes a methodology that must be followed when calculating biodiversity loss and gain known as biodiversity metric 4.0. The Environment Act also introduces a target on species abundance for 2030 along with a requirement for Local Nature Recovery Strategies and the creation of a Nature Recovery Network. Whilst establishing the requirement for BNG, the relevant primary legislation for the statutory framework for BNG is principally set out under Section 90A and Schedule 7A (Biodiversity Gain in England) of the Town and Country Planning Act 1990. This legislation was inserted into the Act by Schedule 14 of the Environment Act 2021 and includes amendments made by the Levelling Up and Regeneration Act 2023 and the Biodiversity Gain (Town and Country Planning) (Consequential Amendments) Regulations [2024]. It is envisaged that this will come into effect in January 2024.

In relation to European legislation, the EC has adopted two Directives to provide protection for Europe's flora and fauna. In relation to birds, Council Directive 79/409/EEC on the conservation of wild birds provides a framework for the conservation and management of wild birds in Europe. Other habitats and species are protected through Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora which requires Member States to schedule important wildlife sites through the European Community as Special Areas of Conservation (SAC's) and to give protection to habitats and species listed in the Directive as being threatened or of Community interest. The Habitats Directive was transposed into UK law by the 'Conservation (Natural Habitats, &c.) Regulations 1994'. The Regulations have been amended several times since their introduction and were consolidated through the Conservation of Habitats and Species Regulations 2017 and subject to further minor amendment through the Conservation of Habitats and Species Regulations

2018. Whilst the UK has now left the European Union, this tier of legislation continues to be applied to the most important habitats and species.

4.2 Policy

4.2.1 National Policy

'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra in 2011. This superseded the previous England biodiversity strategy 'Working with the grain of nature'. 'Biodiversity 2020' built on the Natural Environment White Paper for England – 'The Natural Choice' and provides a picture of how England is implementing its international commitments. It set out a strategic direction for future biodiversity policy. More recently, the 25 Year Environment Plan was published in 2018 and included a commitment to publish a new strategy for nature, building on the existing strategy. In addition, the Government committed in September 2020 to protect 30% of UK land by 2030 as part of the UK's commitment to the Leaders Pledge for Nature. In more recent times, delivery of BNG has become central to national policy going forward.

4.2.2 County and Local Policy

At the County level, 'Space for Wildlife: Leicester, Leicestershire and Rutland Biodiversity Action Plan' sets out priorities for biodiversity conservation. The plan includes a series of habitat and species actions plans which establish biodiversity priorities for the County. Two of the key components of the plan of relevance to a development such as this are the restoration, management and creation of BAP Priority Habitats and the creation of new wildlife habitat in the wider countryside. Also at the County level, Leicestershire County Council has recently developed 'Action for Nature – A Strategic Approach to Biodiversity, Habitat and the Local Environment'. This was been developed partly in recognition of the then Environment Bill and its proposals for the development of local Nature Recovery Strategies and Partnerships, and making BNG a mandatory requirement.

At the local level, The Hinckley and Bosworth Borough Council Core Strategy is the key Development Plan Document (DPD) in the Local Plan 2006 - 2026 (formerly Local Development Framework (LDF)) providing the vision and spatial strategy for the borough. The environment and particularly green infrastructure are a particularly important part of the strategy. Specific to this, Spatial Objective 10 (Natural Environment and Cultural Assets) is *"to deliver a linked network of green infrastructure, enhancing and protecting the borough's distinctive landscapes, woodlands, geology, archaeological heritage and biodiversity and encourage its understanding, appreciation, maintenance and development."* Relevant to Barwell and the application site, a key objective is to *"deliver the strategic green infrastructure network detailed in Policy 20. To achieve this, strategic interventions involving the Barwell Sustainable Urban Extension and the Hinckley/Barwell/Earl Shilton/Burbage Green Wedge will be implemented."* Policy 20 (Green Infrastructure) states that *"the implementation of the Green Infrastructure Network as outlined on the Key Diagram is a key priority of the council. The strategy also refers to the Barwell Sustainable Urban Extension (SUE) which is to "retain strategic footpath routes that pass through the site to ensure access from Barwell to the open countryside, retain the River Tweed corridor as an open watercourse and as a strategic route for recreation, maintaining access between Barwell and the open countryside and investigate the possibility of creating a larger green space within the green wedge that separates Barwell and Hinckley to improve*

*the recreational offer for the residents of the Sustainable Urban Extension and the residents of North
Hinckley."*

5.0 SURVEY RESULTS

5.1 Desk Study

5.1.1 Introduction

As part of the EclA a detailed desk-based study has been undertaken. This has involved the consideration of a number of published documents and other information relevant to the study area. Key sources of information reviewed as part of the desk study particularly include the 2017 and 2021/22 EclAs completed for virtually the same site. In addition, for the 2021/22 assessment, all records within 2km of the site were obtained from the Leicestershire and Rutland Environmental Records Centre. A summary of the desk-based study is provided below. Specific to the two previous EclAs, the most recent survey represents the key desk-based source and is summarised below.

5.1.2 2021 EclA for the Study Area

The 2021 application site comprised of ten pasture fields described as semi-improved neutral grassland. They all displayed evidence of historic improvement for agriculture. Certain fields were, however, more species-rich and supported a range of less common meadow species. These included species such as Great Burnet, Oval Sedge, Pepper-saxifrage, Pignut, Tormetil and Yellow-rattle. They were assessed against the LWS selection criteria for mesotrophic grassland. With ten indicator species, Field 4 (Field 5 of this application) met the LWS criteria. Field 10 (also Field 10 of this application), with nine such species is one species off achieving the threshold.

Fields were bordered by twenty-two hedgerows and field boundaries, four of which were identified as important when assessed using the ecological criteria as set out in the Hedgerows Regulations 1997.

A limited range of other habitats were present, for example, patches of ruderals, Bramble scrub and Blackthorn scrub.

Breeding bird surveys recorded a typical range of species. Whilst supporting typically common species, the structural quality of the hedgerow/boundary network along with added presence of mature trees was such that the variety of species and numbers of individual territories was relatively high and indicated a habitat of high local value.

Bat surveys found no evidence of roosting bats. Activity surveys yielded a limited number of species with Common Pipistrelle representing in excess of 98% of all records. More notable were a small number of records of Leisler's bat. The western boundary was confirmed as a commuting corridor that was used by early emerging Common Pipistrelle, presumed to be associated with a roost site in the adjacent housing estate or industrial units.

Two large ponds are present approximately 110m east of the site. Both were found to be heavily stocked with coarse fish. Previous eDNA analysis yielded negative results for Great Crested Newt.

5.1.3 Leicestershire and Rutland Environmental Records Centre Data Search

The data search includes records from the 2017 EcIA which has been fully reviewed as part of this assessment. No other site specific records arose from the data search. In terms of key species, the more recent 2021 survey typically recorded more species, particularly in respect of plants.

In the wider local area, the search included numerous bat records, some of which corresponded to locations close to the boundaries of the site. The closest record of a roost site was, however, approximately 500m distant. Regarding other notable mammals, there are records of Brown Hare and Hedgehog as well as historic records of Water Vole. All of these were, however, typically in excess of 1km from the site. The search also provides records of Badger although the closest record was 400m distant.

No known records of Great Crested Newt within 400m of the site were provided. Several records of commoner amphibians were also provided although all were also distant from the site.

Records of reptiles were limited to Grass Snake with the closest record being in excess of 1km from the site.

The search also yielded a number of uncommon and declining bird records. None of these were, however, in close proximity to the site.

5.1.4 Other Data Sources

Other sources did not yield any additional notable records for the site and its surrounds.

5.2 **Statutory and Non-Statutory Sites of Nature Conservation Interest**

5.2.1 Statutory Designations

There are no European protected sites within 10km of the application site.

The closest Site of Special Scientific Interest (SSSI) is Burbage Woods and Aston Firs SSSI which is located 1.7km south of the site. This is an ancient woodland site which represents one of the best remaining examples of Oak-Ash-Field Maple woodland in Leicestershire.

Burbage Common and Woods (which includes the SSSI area also) is a designated Local Nature Reserve (LNR) and is approximately 750m south of the application site. It includes a variety of habitats including ancient woodland, scrub and neutral grassland. Regarding fauna, it supports significant assemblages of birds and amphibians.

5.2.2 Non Statutory Designations

Following on from the 2017 ecological survey, hedgerows that were assessed as being important have been identified as a candidate Local Wildlife Site. This relates to five hedgerows within the site, equating to 740m in total. Four Ash trees within the site were also identified as a candidate Local Wildlife Site. These are all retained as part of the development. Following the 2021 survey, one of the Fields (Field 5) was found to meet the LWS criteria for mesotrophic grassland.

In the immediate local area, the two fields immediately south of the site and Leicester Road (SP451961) is a candidate LWS, meeting the criteria for mesotrophic grasslands. The field which borders the site on its southern side i.e., south of Field 7 (SP 451964) is identified as an historic LWS. This refers to sites which were designated in the 1980s-90s but for which there is no recent data. At the time it qualified as an example of mesotrophic grassland. The fields and ponds to the east of the allotments that border the site on its eastern side (SP 452968) is a similar historic LWS that was designated on the basis of mesotrophic grassland and ponds. A further historic mesotrophic site is located north of Dawsons Lane immediately north-east of the site (SP 450969). Whilst there are other designated, candidate and historic LWS sites within the 2km search area, others are distant from the site or with significant barriers.

5.3 Habitats and Plants

5.3.1 Introduction

The study area comprises of a limited range of habitats that can be broadly classified under the following habitat categories:

- Semi-improved Neutral Grassland
- Hedgerows
- Tall Ruderal
- Ruderal/Ephemeral
- Scrub

These are described further below. Appendix 1 provides a full botanical species list with Appendix 2 providing a species list for each of the surveyed fields. Appendix 3 provides details of hedgerows and boundaries. A photographic record of all habitats is provided in Appendix 5A-5C. The general characteristics of the habitats encountered across the site are described below. The specific location of individual fields and hedgerows is shown on Figure 2.



Figure 2: Field and Field Boundary Locations

5.3.2 Semi-Improved Neutral Grassland

The application site comprises of ten pasture fields (Fields 1-10) with an eleventh bordering the application site on its southern side and included as part of the biodiversity enhancement plan for the proposed development. Fields are typically bounded by a series of largely unmanaged hedgerows. All fields are best described as semi-improved neutral grassland. Typical grasses include abundant and locally dominant Yorkshire-fog *Holcus lanatus*, frequent Common Bent *Agrostis capillaris* and Crested Dog's-tail *Cynosurus cristatus*, locally frequent Creeping Bent *Agrostis stolonifera*, Meadow Foxtail *Alopecurus pratensis*, Perennial Rye-grass *Lolium perenne* and Red Fescue *Festuca rubra* and more occasional Cock's-foot *Dactylis glomerata* and Sweet Vernal-grass *Anthoxanthum odoratum*. More rarely occurring grasses include Soft-brome *Bromus hordeaceus*, Meadow Barley *Hordeum secalinum*, Meadow Fescue *Schedonorus pratensis*, Smaller Cat's-tail *Phleum bertolonii*, Timothy *Phleum pratense* and Smooth Meadow-grass *Poa pratensis*, with very rarely occurring Downy Oat-grass *Avenula pubescens*, Heath-grass *Danthonia decumbens*, Tufted Hair-grass *Deschampsia cespitosa* and Yellow Oat-grass *Trisetum flavescens*.

Commonly occurring forbs include frequent and locally abundant Creeping Buttercup *Ranunculus repens* and White Clover *Trifolium repens*, with more occasional Cat's-ear *Hypochaeris radicata*, Common Mouse-ear *Cerastium fontanum*, Common Sorrel *Rumex acetosa*, Meadow Buttercup *Ranunculus acris*, Red Clover *Trifolium pratense* and Ribwort Plantain *Plantago lanceolata*. Other forbs often have a more restricted distribution being found only in certain fields. These include several more notable species, for example, Autumn Hawkbit *Scorzoneroides autumnalis*, Common Bird's-foot-trefoil *Lotus corniculatus*, Common Knapweed *Centaurea nigra*, Great Burnet *Sanguisroba officinalis*, Oval Sedge *Carex leporina*, Oxeye Daisy *Leucanthemum vulgare*, Pepper-saxifrage *Silaum silaus*, Pignut *Conopodium majus* and Tormantil *Potentilla erecta*. These all had a much more restricted distribution with certain species, for example, Pepper-saxifrage, occurring as only a few individual plants.

The fields are locally damper, particularly those in the east where additional species associated with damper patches and occasionally waterlogged ground include Cuckooflower *Cardamine pratensis*, Jointed Rush *Juncus articulatus*, Marsh Foxtail *Alopecurus geniculatus* and Soft-rush *Juncus effusus*. A more substantial wetter area that was present in Field 10 in 2021 had significantly dried in the interim period. It comprises of locally abundant Creeping Buttercup, Great Willowherb *Epilobium hirsutum* and Yorkshire-fog, with rare although locally abundant Brooklime *Veronica beccabunga* and Creeping Bent and rarely occurring Marsh Foxtail, Short-fruited Willowherb *Epilobium obscurum* and Tall Fescue *Schedonorus arundinaceus*.

In recent years the fields have been used for horse grazing. Whilst in 2021, only fields 5 and 6 were subject to high levels of grazing, in the interim period, a livery business has established adjacent the site and uses Fields 7-10. These are now subject to much more intensive horse grazing than was previously the case. Fields 3 and 4 were subject to much lighter levels of use and appeared to be used only as a hay source in 2023. This was also the case for Field 1. Field 2 appears to have been abandoned since 2021. Fields 5 and 6 continue to be subject to high levels of grazing from horses. The off-site Field 11 which was an abandoned False Oat-grass *Arrhenatherum elatius* dominated grassland in 2021 is now subject to horse grazed which has significantly reduced the False Oat-grass and re-established this field as a more typical grazed semi-improved pasture. Where grazing levels have been light or where fields are largely abandoned, locally extensive patches of ruderals are present with locally abundant Broad-leaved Dock *Rumex obtusifolius*, Creeping Thistle *Cirsium arvense* and more occasional Common Ragwort *Senecio jacobaea*, Curled Dock *Rumex crispus* and Spear Thistle *Cirsium vulgare*. Common Nettle *Urtica dioica* is also locally dominant, especially along field edges.

More trampled sections and gate entrances support a typical range of species associated with bare and disturbed ground including Annual Meadow-grass *Poa annua*, Common Chickweed *Stellaria media*, Knotgrass *Polygonum aviculare*, Greater Plantain *Plantago major*, Marsh Cudweed *Gnaphalium uliginosum*, Scented Mayweed *Matricaria chamomilla* and Scentless Mayweed *Tripleurospermum inodorum*. These sections are more extensive than was the case in 2021, particularly in those fields in the west of the site that are now used as part of a livery business.

5.3.3 Hedgerows/Field Boundaries

Fields are bordered by hedgerows and field boundaries. There are twenty across the application site. The locations of these are shown on Figure 2 with survey results for individual boundaries provided in Appendix 3. The boundaries are typically unmanaged and have dense bands of associated scrub. Strictly, several may no longer fall within the definition of a hedgerow. This is typically defined as any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less than 20m wide (Bickmore, 2002). Any bank, wall, ditch or tree within 2m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2m of the centre of the hedgerow. Whilst certain boundaries are therefore probably no longer strictly within the definition of a hedgerow, for the purposes of the description and assessment, they are treated as such. This is particularly as any deterioration is a factor of the lack of management and they all therefore could be returned to a true hedgerow habitat in the future.

In their entirety, the boundaries supported a diverse range of woody species. Twenty-six woody species (trees and shrubs) listed in Schedule 3 of the Hedgerows Regulations were recorded across the site. These were Apple *Malus sylvestris sens. lat.*, Ash *Fraxinus excelsior*, Aspen *Populus tremula*, Blackthorn *Prunus spinosa*, Crack-willow *Salix fragilis*, Dogwood *Cornus sanguinea*, Dog-rose *Rosa canina*, Elder *Sambucus nigra*, English Elm *Ulmus procera*, Field Maple *Acer campestre*, Field Rose *Rosa arvensis*, Goat Willow *Salix caprea*, Grey Willow *Salix cinerea*, Guelder-rose *Viburnum opulus*, Hawthorn *Crataegus monogyna*, Hazel *Corylus avellana*, Holly *Ilex aquifolium*, Honeysuckle *Lonicera periclymenum*, Pear *Pyrus communis*, Pedunculate Oak *Quercus robur*, Rowan *Sorbus aucuparia*, Small-leaved Elm *Ulmus minor subsp. minor*, Wayfaring Tree *Viburnum lantana*, Wild Cherry *Prunus avium*, Wild Plum *Prunus domestica* and Wych Elm *Ulmus glabra*. Regarding notable species, whilst identification to species level is not straightforward, several of the elms were considered to be Small-leaved Elm. Whilst very rare or absent from much of the United Kingdom, this species remains quite widespread in Leicestershire. Other trees and shrubs that are non-native species not included on Schedule 4 of the Hedgerows Regulations were rarely occurring Sycamore *Acer pseudoplatanus* (Hedgerows 3, 4, 5, 14 and 20) and very rare Cherry Laurel *Prunus laurocerasus* (Hedgerow 3). Species that are particularly frequent were Blackthorn, Dog-rose, Elder, Field Maple, Hawthorn and Holly. Regarding the diversity of individual boundaries, Hedgerow 10 supported eleven woody species, Hedgerows 9, 12, 14, 18 and 19 supported ten woody species, and Hedgerows 11 and 16 supported eight such species.

In the absence of management Blackthorn has spread rapidly out from certain boundaries and now forms a dense band of scrub. This has extended the width of certain boundaries to more than 10m.

Whilst the ground flora is often species-poor, more characteristic hedgerow and woodland species are present occasionally. These included Broad Buckler-fern *Dryopteris dilatata*, Dog's Mercury *Mercurialis perennis*, Hairy-brome *Bromopsis ramosa*, Herb-Robert *Geranium robertianum*, Lords-and-Ladies *Arum maculatum*, Male-fern *Dryopteris filix-mas*, Pignut *Conopodium majus* and Wood Avens *Geum urbanum*. Of particular note was the presence of Tutsan *Hypericum androsaemum* in the eastern boundary (hedgerow 10).

Associated features are limited and essentially restricted to ditches. Whilst often defunct, the eastern boundary associated with boundaries 5 and 10 has more permanent wetness. Whilst semi-

defunct and shaded, this supported several characteristic species, for example, Brooklime, Cuckooflower, Floating Sweet-grass *Glyceria fluitans*, Great Willowherb, Greater Bird's-foot Trefoil *Lotus pedunculatus*, Marsh Thistle *Cirsium palustre*, Square-stalked St John's-wort *Hypericum tetrapterum* and Trifid Bur-marigold *Bidens tripartita*.

A number of boundaries support several or more mature trees, particularly Ash and Pedunculate Oak. These are particularly numerous along the eastern and southern boundaries 10 and 14 although are also present more occasionally in several others. Other mature trees include Crab Apple, Field Maple and Pear.

5.3.4 Tall Ruderal

In addition to locally extensive patches of tall ruderals in certain fields, they are occasionally present elsewhere, for example, as a band at the western side of Field 5 where it bounds the gardens of adjacent properties. Here the vegetation includes locally dominant stands of species such as Broad-leaved Dock, Common Nettle and Creeping Thistle. Bramble is also locally dominant in this part of the site.

5.3.5 Scrub

Typically, always associated with the field boundaries, in the absence of management, suckering Blackthorn has quickly spread out from the hedgerows and has established as a dense band of Blackthorn scrub across parts of the site. At those hedgerows where Blackthorn is less prominent, or where there are historic gaps in boundaries, this is replaced by dense Bramble scrub.

5.3.6 Species

The survey yielded in excess of 150 species of vascular plant. No nationally rare or scarce species were recorded and virtually all were typical species of the habitats found in the study area. Several species were, however, less common and are species which are declining nationally. This included several grassland species. Of these, Pepper-saxifrage was of particular note and is an increasingly uncommon species that has undergone significant declines in recent decades.

Also of note was the record of Tutsan from the eastern boundary. This is an uncommon species in Leicestershire. Its true origin here is unclear and it is possibly associated with a naturalised plant.

Within the hedgerows, there is some variation in the elms that are present, with several shrubs appearing to be examples of Small-leaved Elm. This is a species which is rare in the UK albeit with its stronghold in the Midlands. Positive identification is not straightforward with the various species of elm readily hybridizing and there being considerable variation in the size and shape of the leaf, even within the same species. There are also several subspecies of Small-leaved Elm. Identification here was therefore precautionary and based upon the presence of several of the typical features associated with Small-leaved Elm.

5.3.7 Invasive Species

No species listed under Schedule 9 (Part II) of the Wildlife and Countryside Act (1981, as amended) were recorded. Regarding other species, whilst not included on Schedule 9, Spanish Bluebell *Hyacinthoides hispanica* is another non-native species which poses a threat to native Bluebell *Hyacinthoides non-scripta*. It was recorded very rarely close to the intersection of boundaries 14, 15 and 16.

Regarding other considerations, many of Ash trees were displaying signs of Ash dieback disease. The effect of the disease to individual trees varied considerably with some trees in a poor condition and others showing little effect.

5.4 **Breeding Birds**

The proposed development site provides a limited range of potential breeding habitat. This habitat is essentially limited to the field boundary hedgerows and associated scrub, hedgerow trees and the animal shelters. No grassland ground nesting species were found within the fields themselves.

Hedgerows yielded a number of breeding species. The most frequently encountered species were Blackbird *Turdus merula*, Dunnock *Prunella modularis*, Robin *Erithacus rubecula*, and Wren *Troglodytes troglodytes*. More occasional species were associated with Blue Tit *Cyanistes caeruleus*, Chaffinch *Fringilla coelebs*, Greenfinch *Chloris chloris*, Great Tit *Parus major*, Song Thrush *Turdus philomelos*, and Woodpigeon *Columba palumbus*. Species that had few territories or nest sites were associated with Blackcap *Sylvia atricapilla*, Bullfinch *Pyrrhula pyrrhula*, Carrion Crow *Corvus corone*, Chiffchaff *Phylloscopus collybita*, Collared Dove *Streptopelia decaocto*, Goldfinch *Carduelis carduelis*, Long-tailed Tit *Aegithalos caudatus*, Magpie *Pica pica*, Pheasant *Phasianus colchicus* (probably breeding), Starling *Sturnus vulgaris*, Stock Dove *Columba oenas* (possibly breeding) and Whitethroat *Curruca communis*.

Estimated territories of each of these species are provided in the table below.

Species	Estimated Territories/Nest Sites
Wren	12
Blackbird	11
Robin	8
Dunnock	7
Blue Tit	4
Great Tit	3
Chaffinch	3
Greenfinch	3
Song Thrush	3
Woodpigeon	3
Blackcap	2
Chiffchaff	2
Bullfinch	1
Carrion Crow	1

Species	Estimated Territories/Nest Sites
Wren	12
Collared Dove	1
Goldfinch	1
Long-tailed Tit	1
Pheasant	1
Magpie	1
Mistle Thrush	1
Starling	1
Stock Dove	1
Whitethroat	1

Regarding other species recorded within the site, a juvenile Barn Owl *Tyto alba* was calling for food from a tree in Hedgerow 9 during the June bat survey. Whilst confirming that the site is within the home range of a breeding pair of Barn Owl, there was no evidence of any nest within the site itself. Any possible nest site would have to be within one of the mature trees. Whilst this possibility cannot be totally dismissed, the more likely habitat is probably in one of the barns or outbuildings on land to the south-east.

Green Woodpecker *Picus viridis* was seen or heard in two visits including a feeding juvenile bird. It therefore bred somewhere in the local area in 2023, possibly within the application site. Both Jay *Garrulus glandarius* and Nuthatch *Sitta europaea* was heard calling albeit with no evidence of breeding.

Species breeding in adjacent habitats were associated with House Sparrow *Passer domesticus*, with a small colony apparently breeding in the new housing estate to the west. Pied Wagtail *Motacilla alba* was breeding in sheds associated with the smallholding to the east of the site.

Kestrel *Falco tinnunculus* was recorded hunting over the site albeit with no evidence of breeding. This was also the case with regard to Sparrowhawk *Accipiter nisus*. Common Buzzard *Buteo buteo* was also recorded over the site. Swallow *Hirundo rustica* and Swift *Apus apus* were noted feeding over the site albeit were non breeding.

5.5 Bats

5.5.1 Roost Sites

A small number of trees were identified that displayed features which are often associated with tree roosting bats. These are shown on Figure 3 and are described below.



Figure 3: Trees with Roosting Potential

- T1: Substantial mature Ash with very dense ivy-cladding. Other PRFs possible.
- T2: Substantial mature Ash with very dense ivy-cladding. Other PRFs possible.
- T3: Substantial Ash. Various PRFs including woodpecker holes, smaller cracks in limbs. Most appeared be used by nesting birds.
- T4: Substantial Ash. Various PRFs including woodpecker holes, smaller cracks in limbs. Most appeared be used by nesting birds.
- T5: Two-stemmed Oak in poor condition with one stem dead/decaying with cracks, holes and possible voids.
- T6: Substantial mature Ash with very dense ivy-cladding. Other PRFs possible.
- T7: Substantial mature Ash with several cracks and holes, also dense ivy-cladding. Other PRFs possible.

Of the above, T1-5 were all considered to fall within the low roost potential category. Trees 6 and 7 were considered to offer moderate potential.

Dusk and dawn observations of these trees found no confirmed evidence of roosting bats. However, a single Common Pipistrelle was observed in the early dawn period in the vicinity of T3 and T4. The

light was, however, too poor to observe precisely what this bat did. It does, however, seem likely that it was probably roosting in one of these trees, most probably T3.

It should be noted that Ash dieback is evident to differing degrees in the majority of Ash trees across the site. This could result in the roost potential of individual trees becoming much more fluid than was previously the case.

Regarding the buildings on site, these are essentially a series of stables, storage sheds and other animal shelters (see Figure 3) as follows:

- Building 1 comprises of modern wooden stabling and storage at the northern side of Field 1. The buildings are clad with wooden panelling with a gently pitched corrugated roof. They are in good condition with no obvious potential roosting habitat.
- Building 2 is a group of storage buildings. They are open fronted and constructed with a prefabricated concrete shell with timber boards and corrugated metal sheets repairing damaged sections of the walls. They are open, airy and light and have no obvious internal voids or other space that could be used by bats. The tops of the buildings are densely clad in ivy.
- Buildings 3 and 4 were used for horse stabling and have low brick walls with some timber broad frontages, with an upper construction of corrugated metal sheeting. They are open, airy and light and have no obvious internal voids or other space that could be used by bats.
- Building 5 is located to the south of Building 4. It is a breeze block built barn with corrugated asbestos sheet upper and roof with Perspex skylights. It is open and light and without any roof void. The asbestos cladding does, however, provide some potential opportunities for bats in the section where the breeze block and asbestos sheeting overlap.
- Building 6 is an open animal shelter constructed of wooden boards with a corrugated sheet roof. It is open-fronted, light and airy and with no apparent voids that could be used by roosting bats.
- Building 7 refers to a series of wooden stables and sheds that provide shelter and storage for the horses that graze Fields 5 and 6. They are of typical design, of wooden panel construction, open, airy and light. None have any obvious internal voids or other space that could be used by bats.

Whilst the buildings were typically considered to offer no opportunities for roosting bats, direct observations of the asbestos clad sections of Building 4 were made at both dusk and dawn. Whilst these yielded negative results, the possibility of occasional use cannot be totally dismissed. A photographic record of the buildings is provided in Appendix 5D.

Regarding other roosting evidence, during the course of the first survey, an estimated twelve Common Pipistrelle bats were observed exiting from a roost site somewhere within the industrial estate to the west of the site. Whilst the precise exit point was not observed, this appeared to be somewhere close to the top of the central warehouse style building. Bats exited the roost and flew southwards.

5.5.2 Survey Results – Foraging

Foraging surveys were essentially based upon walking transects of the site in combination with static observations. All boundaries were walked during each visit with the routes alternated.

Species recorded during the survey were as follows:

- Common Pipistrelle *Pipistrellus pipistrellus*
- Soprano Pipistrelle *Pipistrellus pygmaeus*
- Noctule *Nyctalus noctula*
- Nathusius' Pipistrelle *Pipistrellus nathusii*
- Leisler's *Nyctalus leisleri*

By far the most common species was Common Pipistrelle which accounted for in excess of 85% of all records. Noctule was the second most frequently encountered species with 21 registrations equating to 11% of all records. The remaining species were all recorded on one of the surveys only and in very low numbers. This related to three Nathusius' Pipistrelles, two Soprano Pipistrelles and a single Leisler's. What was surprising was that, despite good survey conditions on each survey, the numbers from the first survey were significantly higher than on the other two. The June survey also yielded the only records of Noctule. The number of registrations for each species across the three surveys is summarised in the table below.

	30 th June/1 st July	27 th /28 th July	28 th /29 th September	Total
Common Pipistrelle	108	32	26	164 (85.9%)
Noctule	21	0	0	21 (11%)
Nathusius' Pipistrelle	3	0	0	3 (1.6%)
Soprano Pipistrelle	0	2	0	2 (1%)
Leisler's	0	0	1	1 (0.5%)

With regard to key commuting routes, numbers of Common Pipistrelle observed during the early dusk period flying N-S along Hedgerows 15, 19 and 20 indicated that this was a regularly used and important route. This was also noted in the 2021 and is now confirmed as being associated with a roost site within the industrial estate to the west of the application site. .

Whilst no other key early dusk commuting routes were identified, bats were regularly observed along the majority of the mature boundaries, particularly in the June survey. As such, distinctive landscape features such as Dawson's Lane and the eastern boundary Hedgerows 5 and 10 were considered to be important corridors. Later in each of the survey visits, foraging was observed along the majority of the boundaries and very rarely within more open habitats. Whilst dominated by common species, the numbers of bats involved indicated that the habitats provide an important foraging habitat for the local bat population.

5.6 Amphibians (Great Crested Newt)

5.6.1 Desk Study

There are no known records of Great Crested Newt within 500m of the site. In the wider local area, there are five ponds within 500m of the site which are visible on maps and aerial photography. The nearest relate to two large ponds approximately 110m east of the site. These ponds were surveyed using eDNA analysis as part of the 2017 EclA for this application site. This yielded negative results. A third pond is to the south and physically separated by the A47. This has been subject to eDNA analysis previously in relation to a proposal for a crematorium, this yielding negative results. The other two ponds are to the west, both in excess of 250m from the application site and physically separated by residential properties, The Common and intensively managed amenity grassland.

5.6.2 Pond Assessment

Whilst there was nothing to indicate that Great Crested Newt were present locally, as part of the 2021 assessment, the two ponds to the east were subject to a survey visit, Habitat Suitability Index survey and precautionary egg search and torch survey. With no changes in the interim period, this assessment remains valid. Both ponds are relatively large with the western one extending over an area of approximately 45m x 15m and the eastern one 50m x 35m albeit narrowing to 15m at one end. They are both deep with depths exceeding 1m. Both are heavily stocked with coarse fish and have been used as commercial angling ponds for a number of years. The banks have been reinforced with boards and railway sleepers to facilitate angling. Angling is undertaken from two sides only with the other banks inaccessible and comprising of dense bankside scrub that shades the margins. Bankside trees also shade the ponds locally. The marginal and aquatic vegetation is poorly developed albeit with occasional and very locally abundant Bulrush *Typha latifolia* and Yellow Iris *Iris pseudacorus* and Hard Rush *Juncus inflexus*.

When assessed using the Great Crested Newt Habitat Suitability Index (HSI) (Oldham RS, Keeble J, Swan MJS & Jeffcote M. 2000), both ponds achieve a score of 0.44. This puts the ponds in the poor category within which it is estimated that only 0.03% of ponds would support Great Crested Newt. The key limiting factor here is the large fish population. This was overlooked in the 2017 survey yet is one of the most significant limiting factors for Great Crested Newt. A precautionary torch survey and egg search in 2021 yielded negative results. Given the desk information, historic eDNA survey and this assessment, no further surveys were completed as part of this assessment.

Whilst unrelated to this assessment, one record of note from these ponds from 2021 was of Otter *Lutra lutra* with a single old spraint noted on a fallen willow. This is a rare although increasing species in Leicestershire.

5.7 Badger

Evidence of Badger was found during the survey. Given the sensitive nature of Badger survey information, the findings of this survey have been presented to the planning authority separately.

5.8 Other Species

As part of the survey, consideration was given to the potential for other key rare or legally protected species to be present within the site. This was undertaken through a combination of desk-study, habitat assessment and direct search. Where applicable, consideration was given to the wider local area.

Other mammals were limited to Grey Squirrel and Rabbit. Declining mammals such as Brown Hare *Lepus europaeus* and Hedgehog *Erinaceus europaeus* were not recorded during the field surveys.

With regard to reptiles, this is a group of species which are rare or absent in the local area. Grassy margins do have the potential to support more mobile species such as Grass Snake *Natrix natrix* at times. The occurrence of this species would, however, be partly dictated by the availability of a viable food source. In the absence of areas of optimum feeding habitat, any usage of the study area is therefore likely to be on an exceptional basis only.

There was nothing to suggest that the study area would be of any elevated value for invertebrates.

6.0 EVALUATION

6.1 Habitats/Plants

6.1.1 Habitats

The semi-improved pastures can be considered against the Leicestershire and Rutland Local Wildlife Site criteria. This is based upon the presence of indicator species regarded as being important for a particular grassland habitat (neutral, acid, calcareous and wet). In relation to neutral grasslands, primary criteria are that the grassland should be at least 2500m² or 200m of linear habitat in extent in which at least 7 indicator species from list F should be Occasional (5-9% cover), Frequent (10-24% cover), Abundant (25-74% cover) or Dominant (75-100% cover) or at least 10 species from grassland list F should be present.

Regarding, the indicator species for neutral grasslands, whilst there was considerable variation between individual fields, sixteen indicator species were recorded across the site. These were Autumn Hawkbit, Common Bird's-foot Trefoil, Common Knapweed, Common Sedge, Common Sorrel, Field Woodrush, Great Burnet, Meadow Buttercup, Meadow Vetchling, Oval Sedge, Oxeye Daisy, Pepper-saxifrage, Pignut, Red Clover, Tormentil and Yellow-rattle. Whilst none of the fields had seven indicator species that were at least occasional, with ten species, Field 5 meets the LWS criteria. With 9 species, Field 10 is one species off achieving the threshold.

Whilst the primary criteria form the basis for measuring habitat quality, secondary criteria are also important and sites can be designated on this basis. This is typically where there is associated interest, for example, the site meets the secondary criteria for the habitat which it is an example of and is accessible to and widely used by the local community or there is a sense of ownership of the site by the local community. Secondary criteria for grassland habitats are that the site is at least 2500m² in extent, in which at least 8 species from the four grassland indicator species lists combined are present. In addition to Field 5, Fields 9 and 10 meet the secondary criteria for indicator species. Whilst moderately diverse, Field 6 supported 7 indicator species.

Other fields are less species-rich, particularly in LWS grassland indicator species. Field 7 supported 6 indicator species, Fields 1, 2, 4 and 8 had 4 species, Field 3 had 3 species and Fields 3, 7 and 9 each had two indicator species. The adjacent Field 11 that is being promoted for enhancement supported four species.

In terms of valuing these grasslands, for Field 5 it is important to consider the LWS definition. They are defined as *"important reservoirs of rare, local and declining native species and are the best examples of typical Leicester, Leicestershire and Rutland habitats. LWS may also be areas of ecological interest that provide people with the opportunity to learn about, appreciate and experience habitats and species of the natural world."* Whilst there have been some changes to the management of individual fields since 2021, all remain in a typically poor condition due to inappropriate management. The dominant factor now is that of overgrazing. As was the case in 2021, this relates to Fields 5 and 6. In addition with the establishment of a livery business that rents several fields, this now also applies to Fields 7, 8, 9 and 10. Field 1 appears to be somewhat undergrazed although it was cut for hay in 2023. Since 2021, the adjacent Field 2 appears have been abandoned since this time. Fields 3 and 4 are in a better condition than was the case in 2021

although remain adversely affected by inconsistent management. The off-site Field 11 that was abandoned in 2021 is now overgrazed by horses.

Using the accepted definitions and taking into consideration the current condition, Field 5 is considered to be a habitat of moderate County importance. Fields 10 and 11 are of moderate district importance. Regarding other fields, whilst the current survey does not indicate any particular elevated value, it is important to consider these in terms of current management and restoration potential. Whilst strictly outside of the impact assessment and more relevant to long-term biodiversity enhancement, it seems clear that other fields offer significant potential for enhancement. This is considered in further detail in Section 8.

Regarding the field boundaries, these were assessed using the ecological criteria as set out in the Hedgerows Regulations 1997. This methodology is essentially based upon the woody species, structure, ground flora, fauna and associated features. The methodology involves the sampling of 30m sections within 100m lengths of hedgerow. Typically, a hedgerow needs to have seven or more woody species per sampled section to be classified as important in accordance with the Regulations although this number is reduced according to the presence of other associated features. The results of this assessment are provided in Appendix 3. Using this methodology, boundaries 5, 10 and 14 qualified as important. These results are slightly different than the 2017 survey. This did, however, adopt a different approach in simply dividing the number of species by the hedgerow length as opposed to sampling 30m sections. This approach runs the risk of skewing the average number of species and therefore can lead to misleading results.

Whilst the other boundaries do not meet the criteria for important when classified as important under the Hedgerows Regulations, the NERC S41 Act Habitats of Principal Importance adopts a much broader definition for this priority habitat type. Specific to this, a hedgerow is defined as any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less than 20m wide (Bickmore, 2002). Any bank, wall, ditch or tree within 2m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2m of the centre of the hedgerow. All hedgerows consisting predominantly (i.e., 80% or more cover) of at least one woody UK native species are therefore covered by this priority habitat. Notwithstanding the lack of management and spreading scrub, using this approach, all of the boundaries are therefore representative of the priority habitat. This much broader definition of the priority habitat type is a revision of the original 'Ancient and/or Species-rich Hedgerows' UK BAP priority habitat type.

In many respects for the purpose of evaluation, the overall hedgerow network needs to be considered. As such, the site clearly supports a well-established network of field boundaries of some antiquity which are of at least moderate district importance. With appropriate management, current value could be increased (see Section 8.0).

6.1.2 Species

In relation to individual plants, the indicator species used in LWS site selection provide a sound basis for identifying species of elevated value. These lists do, however, contain a number of species that remain common in suitable habitats and, for LWS sites, it is typically the assemblage of species that

is more important. Notwithstanding this, several of these species are typically confined to higher quality habitats and are species which have seen rapid national declines and are now uncommon in Leicestershire and the wider region. Of these, Pepper-saxifrage is the most noteworthy. Species such as Great Burnet and Yellow-rattle, whilst remaining widespread are uncommon species which continue to decline.

Within the hedgerow network, whilst remaining reasonably widespread in the Midlands, as species which is rare or absent over large parts of the UK, the probable occurrence of Small-leaved Elm is noteworthy. Regarding hedgerow trees, whilst these are typically common and widespread species, the occasional presence of mature native trees, particularly Ash and Pedunculate Oak with other rarely occurring species such as Crab Apple and Pear are of high value in the site context.

With regard to other species, all were common or relatively common species typical of the habitats present within the application site. Whilst adding to the overall biodiversity of the site, they have no particular value in any wider geographical context.

6.2 Breeding Birds

6.2.1 Habitats

Whilst the site supports a limited range of habitat types, the structural quality of the hedgerow/boundary network along with the added presence of mature trees was such that the variety of species and numbers of individual territories was relatively high. This indicates a habitat of high local value. When considering formal means of assessment, the Leicestershire and Rutland LWS site selection criteria for breeding bird assemblages is based upon a scoring system. Common species typically score 1 (>10000 pairs) with the rarest species scoring 6 (not an annual breeder). To meet the LWS criteria, the sum of the individual species scores must be equal to or greater than the threshold value given for the appropriate habitat. There has to be evidence that a species is breeding for its score to be included in the sum. Whilst there is no specific hedgerow category, the threshold value for woodland, scrub, parkland, allotments and golf courses is 40. The score for this site is 34 which is very similar to the score of 32 that was achieved in 2021. This is therefore below the threshold for County importance and concurs with the high local value assessment.

Other habitats within the site were all limited in extent and of negligible value to breeding birds.

6.2.2 Species

When considering individual species, those with elevated importance include species that are included on the NERC Section 41 list of Species of Principal Importance for the Conservation of Biodiversity in England. In addition, the British Trust for Ornithology publishes a Red and Amber List for declining species. The Red List refers to species which are of high conservation concern and which have typically seen a severe decline in the UK breeding population size of more than 50% over the last 25 years or over the entire period used for assessments since the first Birds of Conservation Concern (BoCC) review in 1969. The Amber List refers to species of moderate conservation concern which have seen a moderate decline (by more than 25% but less than 50%) in breeding numbers over the last 25 years. Those species which are not of any particular conservation concern are included on the BTO Green List. This list typically includes our most common breeding birds which

have not experienced any significant reduction in their populations to date. Species recorded breeding within the site can be summarised as follows:

Species	Territories/Nest Sites	
Wren	12	BTO Amber
Blackbird	11	BTO Green
Robin	8	BTO Green
Dunnock	7	BTO Amber, NERC S41
Blue Tit	4	BTO Green
Great Tit	3	BTO Green
Chaffinch	3	BTO Green
Greenfinch	3	BTO Red
Song Thrush	3	BTO Amber, NERC S41
Woodpigeon	3	BTO Amber
Blackcap	2	BTO Green
Chiffchaff	2	BTO Green
Bullfinch	1	BTO Amber, NERC S41
Carrion Crow	1	BTO Green
Collared Dove	1	BTO Green
Goldfinch	1	BTO Green
Long-tailed Tit	1	BTO Green
Pheasant	1	BTO Green
Magpie	1	BTO Green
Mistle Thrush	1	BTO Red
Starling	1	BTO Red, NERC S41
Stock Dove	1	BTO Amber
Whitethroat	1	BTO Amber

The four NERC S41 species are regarded as priorities for conservation. Numbers from the site are, however, typical for these types of habitats and do not infer any particular elevated value for any individual species. The presence of these species does, however, provide a focus for targeted habitat management in the future.

In the wider local area House Sparrow is a BTO Red List and NERC S41 species that breeds in the adjacent housing estate. Numbers were difficult to establish although would appear to be small (<10 pairs). Despite the currently low numbers, any viable colony is of local importance.

6.2.3 Bats

All bat species are protected under both national and international legislation. Likewise, the majority of species are NERC S41 Species of Principal Importance. Whilst indicating international importance, site value along with the value of individual features within the site, must be viewed in the context of the nature of the activity and the species involved. Specific to this, there was no confirmed roosting (one probably roosting Common Pipistrelle was observed on one occasion within the site with activity limited to commuting and feeding only. In relation to species, in excess of 85% of all

records were of Common Pipistrelle. This is the commonest UK bat and the most widespread species in Leicestershire. Although less common, both Soprano Pipistrelle and Noctule remain widespread in Leicestershire. Although species records of local importance, the presence of these species is entirely consistent with habitats present in parts of the site and wider local area. More notable were the records of Leisler's and Nathusius' Pipistrelle. Regarding Leisler's, although widespread in lowland England it is uncommon and has a distinctly patchy distribution. Whilst the rarity of records did not indicate a habitat of any particular elevated value to the species, any confirmed usage represent records of high local importance. Nathusius' Pipistrelle is a rare species albeit with an ever increasing number of records as recording technology improves. It is widespread across the Midlands including Leicestershire although with a patchy distribution. As with Leisler's, whilst very rarely recorded in this survey, any confirmed presence is of high local importance.

In relation to the usage of habitats within the site, the western boundary was a commuting corridor that was used by early emerging Common Pipistrelle associated with a roost site in the adjacent industrial estate. Whilst this proved to be a key corridor, bats also used Dawson's Lane as well as the eastern boundary for commuting. These boundaries as well as others within the site were also regularly used for foraging. These corridors/foraging habitats are of high local importance to bats. Whilst bats were occasionally recorded crossing open fields, these open areas were typically unused by bats and represent a habitat of low value.

6.2.4 Other Species

On the basis of the current survey there is nothing to suggest that the survey area is of any elevated value to any other key rare or legally protected species or species-groups.

7.0 IDENTIFICATION & ASSESSMENT OF ECOLOGICAL IMPACTS

7.1 Introduction

Ecological impacts can arise at all stages of a particular development project, namely, within the pre-development, the mid-development and the post development scenarios. Impacts during the pre-development aspects of a given plan may result from such activities as preliminary ground investigation work, initial site clearance, building demolition, topsoiling, re-grading and drainage works. Mid-development impacts are essentially related to the construction activities themselves, whilst post-development impacts are typically impacts on wildlife within and adjacent to the development zones which may occur due to human interference in one form or another. Physical disturbance may result from the presence of people, noise created by people/other sources, vehicular disturbance and accidental or deliberate pollution incidents. Such disturbance may lead to habitat deterioration and the disturbance of individual animals using these peripheral areas.

Impacts can be either temporary or permanent. Temporary impacts are typically less significant than the longer term or permanent impacts of a development. They may include risks such as disturbance to local birds and other animals using the site at this time or may come from pollution incidents or similar. Temporary habitats may also be created during this stage of development which are utilised by individual species, for example, certain birds utilising open habitats, etc. Of particular importance is the risk of temporary disturbance to those species which are either rare or legally protected, for example, breeding birds, bats, etc.

In relation to permanent impacts, these are permanent impacts on wildlife both within and adjacent to a development which may occur due to human disturbance or interference in one form or another. There are many potential impacting activities, for example, physical disturbance from the presence of people, elevated noise, elevated light, the dumping of rubbish and accidental or deliberate pollution incidents. Such disturbance may lead to habitat deterioration and the disturbance of individual animals using the site.

7.2 Development Plan Used in the Assessment

Key aspects of the development plan which are of relevance to the impact assessment are as follows:

- The proposal is based upon a 95-unit development that is concentrated in the western part of the application site (Fields 1, 2, 3, 4, 5 and the north-west section of Field 6). The residential development and associated access roads covers approximately 3.81ha of the wider 10.92ha application boundary.
- The overall general land distribution across the site will be approximately 2.86ha of residential development, 0.95ha for the primary and associated access roads, 0.93ha of amenity grassland providing public open space, 0.44ha for a sustainable drainage system, 2.65ha of mixed scrub and native woodland and 3.09ha of managed meadows. An additional field to the south of the site (Field 11) will also be established as a managed meadow and contributes an additional 1.1ha to this habitat type.
- Access to the site will be off 'The Common' and will involve an access road across Field 6.

- With the exception of a Sustainable Drainage Feature in Field 7, Fields 7-10 are not directly impacted and would be retained. Biodiversity enhancement is a key objective in this retained land, providing approximately 3.03ha of managed meadows. There will be a requirement for some woodland planting to reduce visual impact in these fields.
- Impacts to boundaries will be associated with the removal of sections of boundaries 18 (approximately 30m) and 19 (approximately 25m) to facilitate access roads and the removal of a 52m section of hedgerow 17 to facilitate the main access to the site of 'The Common'.
- Virtually all mature trees will be retained. Losses are related to the impacted hedgerow sections, and relate to a mature Pear Tree in Hedgerow 18 and mature Field Maple in Hedgerow 19.

7.3 Construction Impacts

7.3.1 Statutory Nature Conservation Sites

There is no risk of any direct or indirect impact to any SAC, SPA or SSSI as a result of the proposed development.

7.3.2 Non-Statutory Nature Conservation Sites

There would be no direct or indirect impact on any non-statutory nature conservation site as a result of construction activities. Notwithstanding this, Field 5 does meet the LWS designation criteria and is discussed further below. Regarding field boundaries, whilst not currently designated, following the 2017 survey, certain field boundaries are identified as a potential LWS. These are not, however, directly impacted.

7.3.3 Habitats

The development will result in the loss of Fields 1, 2, 3, 4, 5 and the north-west section of Field 6. Of these, Field 5 is moderately species rich and meets the LWS definition for neutral grassland. The loss of this field would therefore represent an adverse impact of County significance. The potential for this impact was identified at an early stage in the ecological assessment process, particularly the need for appropriate mitigation. This is discussed further in Section 8.

Fields 1-4 were of lower value and were amongst the least species-rich of the fields within the site. The loss of these fields is therefore not regarded as being of any particular significance.

The main access to the site along with some development and associated amenity grassland providing public open space will also result in the loss of Field 6. Whilst having some similarities with Field 5, this falls short of meeting the LWS criteria. This is an adverse impact of high local significance.

Woodland and mixed scrub planting in certain fields will result in the loss of some grasslands. This includes a section of grassland associated with Field 10. This is, however, in the western part of this field which is less species-rich when compared with the eastern section. Management of the retained area of grassland should also enable the overall quality of the grassland to be enhanced in the longer-term. Woodland areas will likewise develop into habitat of some value in the site context.

Direct impacts to field boundaries are associated with the loss of an approximate 30m section of Hedge 18, 25m section of Hedge 19 and 52m section of Hedgerow 17. Whilst of significance in the context of the individual boundary, the development provides the opportunity to safeguard and enhance the wider boundary network across the site. This is discussed further in Section 8.0.

7.3.4 Plants

Whilst the loss of species such as Pepper Saxifrage from the site would represent a significant adverse impact, the retention and management of grasslands in the east of the site should enable this and other species to remain within the site. Appropriate management provides the opportunity to increase the populations of these notable species.

7.3.5 Breeding Birds

Direct loss of potential breeding habitat is associated with the impacted sections of hedgerows only. Whilst construction will result in some disturbance impacts adjacent to construction areas, with large parts of the site distant from development works, the most likely outcome during this period will be that such species will displace to alternative habitats in the immediate wider local area. Whilst this would represent an adverse impact in habitats adjacent to the construction area, impacts to the wider site and local area are likely to be negligible.

7.3.6 Bats

With bat activity limited to commuting and foraging, and with large parts of the site retained, impacts to bats are considered to be negligible. Appropriate design and management in the future provides the opportunity to deliver a positive outcome for bats. This is discussed in Section 8.0.

7.3.7 Other Species

No significant adverse impacts have been identified in relation to other species/species-groups during the construction phase.

7.4 After Completion Impacts

7.4.1 Statutory Nature Conservation Sites

There is no long-term risk of any direct or indirect impact to any SAC, SPA or SSSI.

7.4.2 Non-Statutory Nature Conservation Sites

Potential indirect impacts could occur as a result of increased levels of disturbance resulting from the increased local population. However, currently designated sites are either distant from the site or separated by barriers. No impact is therefore predicted.

7.4.3 Habitats

There will be increased public usage within the retained parts of the site including areas which will be subject to biodiversity enhancement measures. For species-rich grassland habitats, the key risks are associated with disturbance due to high levels of public usage which can result in trampling. Nutrient enrichment from dog fouling is also a significant consideration. Whilst potentially significant, appropriate design measures provide the opportunity to address this risk. Whilst some adverse impact is inevitable, such measures should ensure that any adverse impact is of a minor nature. This must likewise be viewed in the context of the current condition and value of the majority of these fields prior to development. The potential benefits to biodiversity therefore significantly outweigh any such risks.

In relation to field boundaries, as these are already well established, it should be entirely possible to retain these without adverse impact. In many respects, these boundaries will also be important in controlling access through the site.

7.4.4 Plants

Post-construction species impacts would be inherently related to the biodiversity enhancement measures within the retained field network. The successful establishment of species-rich neutral grasslands should enable the range of less common species to survive on the site. Appropriate management should increase and safeguard the populations of such species. This represents a major beneficial impact which, depending upon the success of management could be of at least district and possibly county importance.

As with any residential development there would be some risks associated with the release of non-native species into the wild. Whilst this risk is difficult to evaluate, the design of the site, particularly the concentration of habitat creation in zones away from the main development and use of boundaries as buffers, greatly reduces the risk of significant adverse impact.

7.4.5 Breeding Birds

In relation to those species which nest on buildings, opportunities to provide an enhanced breeding habitat for certain key species such as House Sparrow and Starling would represent a beneficial impact of high local significance.

With the majority of field boundaries retained, and with the implementation of appropriate hedgerow management, the habitat would be enhanced and would benefit species which favour this habitat. Whilst typically involving common species, this would represent a major beneficial impact of significance in the site context. This benefit would be elevated to the local context where species of higher conservation value, for example, Song Thrush, see an increased availability of breeding habitat.

7.4.6 Bats

A residential development such as this provides the opportunity to increase the availability of roosting habitats for bats. Whilst occupation can never be guaranteed, the provision of increased potential roosting habitat represents a substantially beneficial impact of high local significance.

With regard to commuting routes and foraging habitats, these are essentially retained. Whilst severance of such habitats could have an impact on commuting, this is unlikely to be the case for Common Pipistrelle which is well adapted to foraging in urban habitats such as this. It is also a species that is not particularly sensitive to the elevated light levels that will be inevitable post-development. Notwithstanding, it will still be important to keep any hedgerow crossing points to a minimum. Furthermore, seeking to maintain dark corridors for bats is important. With appropriate grassland management in the future, insect numbers should significantly increase and this will therefore result in an enhanced foraging resource for bats. Any increased foraging capacity would represent a substantially beneficial impact of high local significance.

7.4.7 Other Species

The biodiversity enhancement measures will lead to post-construction benefits for a range of other species/species-groups. These include particularly those whose habitats are currently absent or poorly represented, for example, invertebrates. This is considered to represent a major beneficial impact of high local significance which, dependent upon the individual species concerned, could be of significance in the wider context.

7.5 **Cumulative Impacts**

Cumulative effects are not considered to be of any particular significance to this proposed development. This is due to the location and the proposed field retention for enhancement purposes. As such, the residential area is located immediately adjacent to already developed land with protected fields extending over a large part of the area south to the A46. There is therefore nothing to suggest that the development of this site would trigger any adjacent unrelated development.

8.0 MITIGATION AND ENHANCEMENT

8.1 Introduction

In many respects, ecological mitigation for this development began at the design stage with interim results from surveys being incorporated into the masterplanning process. This has resulted in the protection of certain habitats, particularly field boundaries and three of the semi-improved pasture fields in the east of the site. The partial retention of the southern field (7) and inclusion of the adjacent field (11) in the wider enhancement plan provides a sound basis for delivering long-term enhancement

Going forward through to any development stage, ecological mitigation is related to advance mitigation requirements to ensure species-protection prior to any construction work beginning as well as an on-going mitigation strategy through the construction process.

In terms of the strict definition of mitigation, this is often taken as referring to all works required to comply with the relevant legislation when developing land occupied by legally protected species. Whilst this provides a basis for considering mitigation, it falls short in terms of maximising the opportunities for biodiversity through appropriate site design and development. With the Environment Act and other national and local policy, the delivery of biodiversity enhancement is an increasingly important requirement. As such, it has been a key objective of this proposed development from the outset.

8.2 Advanced Mitigation Requirements

8.2.1 Habitats (Macro-turfing)

There are merits in seeking to translocate the most species-rich sections of the impacted Field 5. Macro-turfing can be an effective technique and it will help to ensure the retention of several of the uncommon species recorded from Field 5. This will require an ecologist to identify sections that are particularly species rich. From the current survey, these appear to be particularly associated with the eastern side of the field. It will also require the identification of receptor areas within the retained fields. These should be selected so as to avoid any existing sections with higher species diversity and are likely to be in fields 8 and 9. This will require the excavation of the species-poor sections and subsequent replacement with the species-rich turf from Field 5. Whilst the precise details will need to be agreed, other important factors will include any storage requirements. Excavated turfs can quickly deteriorate, particularly in periods of dry weather. Given this risk, it is recommended that any turfing is undertaken as a single operation with turfs excavated and moved immediately to the receptor site.

8.2.2 Breeding Birds

Impacted field boundary sections should be removed outside of the breeding season. This would typically mean the removal of all such habitat outside of the approximate period March to end-July. Any vegetation clearance must achieve complete removal. As such, the removal should not simply be restricted to hedgerow shrubs but will also need to include the strimming/removal of any adjacent tall-herb and other vegetation. Material arising from such clearance, for example, brash and other debris will also need to be removed. Where vegetation clearance works need to be

completed within the potential nesting period it is entirely lawful to clear such vegetation as long as there is no breeding activity within the habitat to be cleared. In such circumstances a suitably experienced avian ecologist would need to confirm that there was no nesting activity prior to works commencing.

8.2.3 Bats

With no trees directly impacted and only one location in hedgerow 13 where a single Common Pipistrelle was considered likely to be roosting, there are no advanced mitigation requirements. Notwithstanding this, with Ash dieback disease evident on the site, there could be requirements for the removal of any trees deemed to represent a risk to the public. If this were the case, further precautionary surveys are likely to be appropriate. If roosting were subsequently confirmed, a formal licence from Natural England would be required before any works to the tree(s) commence. For trees within potential roosting habitats, best-practice is to implement a non-licensed Reasonable Avoidance Measures (RAM's) method statement. This typically involves a felling procedure as well as timing restrictions.

Whilst the buildings on site typically offered no opportunities for roosting bats, precautionary RAMs may be appropriate when removing the cladding from Building 5.

8.2.4 Other Species

Recommendations in relation to Badger are provided separately.

8.3 **Mitigation Requirements During Construction**

Whilst there should be no specific requirements for mitigation during the construction period, appropriate ecological expertise should be retained throughout the construction phase to ensure that all necessary expertise is available, if required. For example, such requirements could include additional checks for nesting birds.

8.4 **Other Mitigation**

Whilst not strictly mitigation; the lighting strategy for the proposed development is an important consideration. Whilst relevant to a variety of fauna, it is particularly relevant to bats. This is particularly as increasing roosting opportunities and providing an enhanced food source should make the local area more attractive to bats in the future. A good first principle is to avoid lighting key habitats. Such habitat could include roosting and swarming sites for all species and their associated flightpath/commuting habitat. On the basis of the current survey this would be most relevant to the western boundary. Given that additional habitats could become more important in the future having retained boundaries and other habitats as dark areas or with luminaries which reduce or avoid impacts on bats and include consideration of the type of light, direction, height, etc. should be considered.

8.5 Management of the Public

With grassland enhancement a key objective, managing public usage within these areas is an important consideration. This includes specific issues such as dog usage as well as more general access. In relation to dogs, it is recommended that an area of retained grassland close to the residential area is established as a dog exercise area. The retained eastern sections of Fields 3 or 4 would appear to be ideally suited for this purpose. Other public access is proposed with a north-south route entering the site off Dawson's Lane in the north-east corner of the developed area and then running along southwards through the retained fields. In order to protect the retained meadows, it is recommended that this footpath route is kept to the fields edges and is clearly waymarked and fenced.

8.6 Biodiversity Enhancement

8.6.1 Introduction

The proposed development has been designed so as protect a certain area of the semi-improved grassland that is present on the site. With the exception of the roadside boundary off 'The Common' and several other access points, all boundaries and mature trees are also retained. Whilst these retained habitats form the basis for biodiversity enhancement, other opportunities will likewise become available. These particularly relate to landscaping and species-specific initiatives.

When developing such measures, it is important to establish a number of key objectives. These help to define enhancement initiatives and to further the design. Objectives for this site are:

- To achieve a net biodiversity gain
- To restore retained grasslands to LWS status throughout
- To enhance public usage and experience
- To maintain connectivity
- To implement species enhancement initiatives

8.6.2 Grasslands

The restoration of the three on-site fields (Fields 8-10), partial restoration of Field 7 and restoration of the adjacent Field 11 represents a key objective. Whilst most of the fields are degraded, the impacted Field 5 meets LWS primary site selection criteria and Field 10, virtually so. Field 9 meets the secondary site selection criteria for species. In reality, all fields would have been more species-rich in the past and all have significant potential for enhancement. In addition to the recommended advance mitigation associated with macro-turfing, additional measures that are likely to be required to achieve this include the following:

- Weed control, particularly to reduce the current levels of docks and thistles across large sections of the retained fields.
- Grazing. Once weeds have been effectively controlled, a period of hard grazing, for example, by sheep is often beneficial in the early stages of grassland restoration.

- Scarification. Under the assumption that these fields could continue to support a good quality seedbank, scarification is likely to benefit new seedling establishment. This would be preferred to more significant restoration measures involving ploughing and reseeded.
- Supplementary seeding. Some supplementary seeding may be appropriate depending upon establishment. The preferred approach would be to gather green hay or seed from the best sections of grassland, particularly Fields 5 and 10 and spread in less species-rich areas across the retained fields.
- Hay Cutting. Once established, managing the fields in a traditional manner will be essential. This will typically involve a single late-summer hay cut with all arisings removed. Whilst in traditional farming systems, light aftermath grazing is often deployed, this may not be appropriate. This can, however, be addressed by other means, for example an additional spring cut, if considered necessary.

8.6.3 Retained Field Boundaries

With the exception of access points, existing field boundaries are retained and used to either delineate the site boundary or the spatial extent of individual development blocks. Whilst these boundaries are often substantial features of some existing value, they would benefit from a defined management regime. They would also benefit from being properly defined, particularly with the control of Blackthorn scrub that has often spread into adjacent fields from the hedgerow. The following measures will achieve this:

- Control and removal of Blackthorn scrub.
- Coppicing and/or laying of hedges to establish an appropriate starting point for future management (likely to be relevant to certain boundaries only).
- Establish a long-term management regime, for example, the rotational management of individual hedgerows on a five-seven year timeframe.
- Restocking of any gaps with a mix of characteristic native species.
- Retention of hedgerow trees with any appropriate tree surgery work completed at the outset to ensure good health going forward.
- Identification and safeguard of young hedgerow trees which have the potential to become hedgerow standard trees in the long term.
- Establishment of a strategy to manage the problems associated with Ash dieback.
- Appropriate management of adjacent habitats to encourage an enhanced hedgerow ground flora.

8.6.4 Main Development Area

Whilst a certain amount of landscaping and structure planting within the development are likely to be dictated by visual or aesthetic requirements necessitating the use of ornamental species, wherever practicable it is recommended that tree planting is with native stock, preferably of local provenance and characteristic of the local flora. Furthermore, with regard to any shrub planting, it is recommended that such planting includes berry bearing species which would provide a valuable potential food source for certain fauna, particularly wintering birds. Whilst grasslands within areas of public open space are likely to need to be able to survive high levels of public usage, in any less pressured locations, opportunities to establish additional wildflower planting are recommended. A

SuDS feature extending over approximately 0.44 hectares of Field 7, provides a further opportunity to establish a habitat which offers some benefits to wildlife.

8.6.5 Species Initiatives

It is recommended that species initiatives are designed into the site from the outset. Opportunities to incorporate bird nesting and bat roosting opportunities into buildings are now readily available and can be easily incorporated without detracting from the buildings in any way. Examples particularly include House Sparrow terraces, Swift bricks and a variety of bat roosts. It is therefore recommended that a target number of such features is agreed and implemented accordingly. The precise location of such features is also important, for example, proximity to foraging habitat, flight corridors, levels of lighting, etc. A final plan should therefore be agreed prior to implementation.

Given the level of retained habitat, the development also provides the opportunity to implement similar bird nesting and bat roosting opportunities in the wider boundary network. This would be particularly through the establishment of such features on trees. Opportunities would be available to target different species of birds and bats.

9.0 RESIDUAL ASSESSMENT

9.1 Residual Impacts

Permanent habitat losses associated with the development are associated with the loss of five pasture fields and partial loss of a sixth. Whilst this includes the loss of one pasture that meets the LWS primary selection criteria for neutral grassland, the development plan provides for the protection and enhancement of the remaining fields as well as an additional field adjacent to the southern boundary of the application site. With appropriate management secured for the future, this should enable the area of species-rich grassland to be increased. The proposals also include for the retention, restoration and long-term management of the site's native species-rich hedgerows and trees. These measures will result in a major beneficial residual impact in the local context which, dependent upon the established species composition and diversity of features such as grasslands, could be of significance in the wider district or County context.

In relation to individual species, the habitat enhancement measures will have knock-on implications in improving the habitat for bats and birds. This would primarily be through the meadows contributing to an enhanced food source. In combination with the provision of artificial roost and nest sites, the habitat will be potentially enhanced for these species. How significant any enhancements would be will depend upon species, nature of usage and population. However, given that the measures are suitable for a number of NERC S41 species, for example, bats and House Sparrow, as well as other declining species of increasing conservation concern, they have the potential to be substantially beneficial.

The development plan also has to be viewed in the context of the do-nothing scenario. This is not considered a good option with any biodiversity interest surviving by default rather than design. Grasslands in particular are at the whim of whatever level of horse grazing a particular tenant chooses. This is seen across the site with overgrazing in Fields 5-10 as well as undergrazing in sections of other fields which are suffering from scrub encroachment and rapid establishment of weeds. In the absence of any need for management, the field boundary network is also deteriorating.

9.2 Biodiversity Net Gain (BNG)

To provide some further assessment of the predicted positive outcome, the proposals have been tested using the Natural England Biodiversity Metric 4.0 (April 2023) and follows guidance set out within the Biodiversity Metric 4.0 User Guide (Natural England Joint Publication JP039, March 2023). Whilst this is an outline planning application and therefore does not necessarily have all of the precise detail required for the calculation, it is possible to assess the proposal on the basis of current information. Whilst the full details of the BNG assessment are provided in the completed metric 4.0 spreadsheet and accompanying report, the headline results are reproduced below.

LAND EAST OF THE COMMON, BARWELL

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Headline Results

Scroll down for final results ▲

On-site baseline	Habitat units	53.06	
	Hedgerow units	24.55	
	Watercourse units	0.00	
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	58.75	
	Hedgerow units	29.67	
	Watercourse units	0.00	
On-site net change (units & percentage)	Habitat units	5.68	10.71%
	Hedgerow units	5.12	20.83%
	Watercourse units	0.00	0.00%

Off-site baseline	Habitat units	4.84	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	11.65	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site net change (units & percentage)	Habitat units	6.81	140.76%
	Hedgerow units	0.00	0.00%
	Watercourse units	0.00	0.00%

Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	12.50	
	Hedgerow units	5.12	
	Watercourse units	0.00	
Spatial risk multiplier (SRM) deductions	Habitat units	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	

FINAL RESULTS

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	12.50	
	Hedgerow units	5.12	
	Watercourse units	0.00	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	23.55%	
	Hedgerow units	20.83%	
	Watercourse units	0.00%	

Trading rules satisfied?	Yes ✓
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Unit Type	Target	Baseline Units	Units Required	Unit Deficit	
Habitat units	10.00%	53.06	58.37	0.00	Unit requirement met or surpassed ✓
Hedgerow units	10.00%	24.55	27.01	0.00	Unit requirement met or surpassed ✓
Watercourse units	10.00%	0.00	0.00	0.00	Unit requirement met or surpassed ✓

Figure 4: BNG Headline Results

Whilst only at the outline stage, with the commitment to retain and reinstate three on site and an adjacent offsite field to lowland meadow represents an important habitat enhancement. From a current baseline of 53.06 habitat units, this approach would deliver 58.75 on-site and 11.65 adjacent post development units. This equates to net biodiversity gain of 23.55%. Clearly, as the detailed elements of any application progress, there may be other aspects of the design which impact on this score. As a precautionary approach has been adopted, this should be an increase in score, for example, as more detail about the main urban design evolves. Following this initial calculation, biodiversity Metric 4.0 should therefore continue to be used to test the more detailed design of the site. It is clear, however, that this design should continue to target lowland meadows as the priority habitat for the retained pastures.

With hedgerows also being largely retained and subject to appropriate long-term management, this also delivers a significant improvement. The current hedges on site deliver 24.55 units. This will increase to 29.67 units in the long-term which equates to a net gain of 20.83%.

APPENDIX 1 – BOTANICAL SPECIES LIST

Scientific Name	Common Name	STATUS
<i>Holcus lanatus</i>	Yorkshire-fog	A/VLD
<i>Ranunculus repens</i>	Creeping Buttercup	F/LA
<i>Rumex obtusifolius</i>	Broad-leaved Dock	F/LA
<i>Trifolium repens</i>	White Clover	F/LA
<i>Cynosurus cristatus</i>	Crested Dog's-tail	F
<i>Poa trivialis</i>	Rough Meadow-grass	F
<i>Prunus spinosa</i>	Blackthorn	O/LD
<i>Rubus fruticosus</i> agg.	Bramble	O/LD
<i>Urtica dioica</i>	Common Nettle	O/VLD
<i>Agrostis stolonifera</i>	Creeping Bent	O/LA
<i>Cirsium arvense</i>	Creeping Thistle	O/LA
<i>Alopecurus pratensis</i>	Meadow Foxtail	O/LF
<i>Festuca rubra</i>	Red Fescue	O/LF
<i>Lolium perenne</i>	Perennial Rye-grass	O/LF
<i>Achillea millefolium</i>	Yarrow	O/VLF
<i>Plantago lanceolata</i>	Ribwort Plantain	O/VLF
<i>Agrostis capillaris</i>	Common Bent	O
<i>Alliaria petiolata</i>	Garlic Mustard	O
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	O
<i>Anthriscus sylvestris</i>	Cow Parsley	O
<i>Bromus hordeaceus</i>	Soft-brome	O
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	O
<i>Cirsium vulgare</i>	Spear Thistle	O
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Galium aparine</i>	Cleavers	O
<i>Geranium robertianum</i>	Herb-Robert	O
<i>Geum urbanum</i>	Wood Avens	O
<i>Glechoma hederacea</i>	Ground-ivy	O
<i>Hypochaeris radicata</i>	Cat's-ear	O
<i>Jacobaea vulgaris</i>	Common Ragwort	O
<i>Poa annua</i>	Annual Meadow-grass	O
<i>Prunella vulgaris</i>	Selfheal	O
<i>Ranunculus acris</i>	Meadow Buttercup	O
<i>Polygonum aviculare</i>	Knotgrass	O
<i>Rosa canina</i>	Dog-rose	O
<i>Sambucus nigra</i>	Elder	O
<i>Senecio vulgaris</i>	Groundsel	O
<i>Silene dioica</i>	Red Campion	O
<i>Stachys sylvatica</i>	Hedge Woundwort	O
<i>Taraxacum</i> agg.	Dandelion	O
<i>Trifolium pratense</i>	Red Clover	O
<i>Cerastium fontanum</i>	Common Mouse-ear	O

Scientific Name	Common Name	STATUS
<i>Mercurialis perennis</i>	Dog's Mercury	R/VLA
<i>Arrhenatherum elatius</i>	False Oat-grass	R/VLF
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	R/VLF
<i>Acer campestre</i>	Field Maple	R
<i>Acer pseudoplatanus</i>	Sycamore	R
<i>Alopecurus geniculatus</i>	Marsh Foxtail	R
<i>Anisantha sterilis</i>	Barren Brome	R
<i>Aquilegia vulgaris</i>	Columbine	R
<i>Arctium lappa</i>	Greater Burdock	R
<i>Arum maculatum</i>	Lords-and-Ladies	R
<i>Avenula pubescens</i>	Downy Oat-grass	R
<i>Bellis perennis</i>	Daisy	R
<i>Bidens tripartita</i>	Trifid Bur-marigold	R
<i>Calystegia silvatica</i>	Large Bindweed	R
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	R
<i>Cardamine pratensis</i>	Cuckooflower	R
<i>Carex hirta</i>	Hairy Sedge	R
<i>Carex leporina</i>	Oval Sedge	R
<i>Carex nigra</i>	Common Sedge	R
<i>Carex pendula</i>	Pendulous Sedge	R
<i>Centaurea nigra</i>	Common Knapweed	R
<i>Cerastium glomeratum</i>	Sticky Mouse-ear	R
<i>Cirsium palustre</i>	Marsh Thistle	R
<i>Conium maculatum</i>	Hemlock	R
<i>Conopodium majus</i>	Pignut	R
<i>Cornus sanguinea</i>	Dogwood	R
<i>Corylus avellana</i>	Hazel	R
<i>Crepis vesicaria</i>	Beaked Hawk's-beard	R
<i>Danthonia decumbens</i>	Heath-grass	R
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	R
<i>Dipsacus fullonum</i>	Wild Teasel	
<i>Dryopteris dilatata</i>	Broad Buckler-fern	R
<i>Dryopteris filix-mas</i>	Male-fern	R
<i>Elymus repens</i>	Common Couch	R
<i>Epilobium montanum</i>	Broad-leaved Willowherb	R
<i>Epilobium obscurum</i>	Short-fruited Willowherb	R
<i>Equisetum arvense</i>	Field Horsetail	R
<i>Equisetum palustre</i>	Marsh Horsetail	R
<i>Erigeron canadensis</i>	Canadian Fleabane	R
<i>Fraxinus excelsior</i>	Ash	R
<i>Glyceria fluitans</i>	Floating Sweet-grass	R
<i>Glyceria notata</i>	Plicate Sweet-grass	R
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	R

Scientific Name	Common Name	STATUS
<i>Heracleum sphondylium</i>	Hogweed	R
<i>Hordeum secalinum</i>	Meadow Barley	R
<i>Hyacinthoides hispanica</i>	Spanish Bluebell	R
<i>Hyacinthoides non-scripta</i>	Bluebell	R
<i>Hypericum androsaemum</i>	Tutsan	R
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort	R
<i>Ilex aquifolium</i>	Holly	R
<i>Iris pseudacorus</i>	Yellow Iris	R
<i>Jacobaea aquatica</i>	Marsh Ragwort	R
<i>Juncus articulatus</i>	Jointed Rush	R
<i>Juncus bufonius</i>	Toad Rush	R
<i>Juncus effusus</i>	Soft-rush	R
<i>Juncus inflexus</i>	Hard Rush	R
<i>Lamium album</i>	White Dead-nettle	R
<i>Lamium purpureum</i>	Red Dead-nettle	R
<i>Lathyrus pratensis</i>	Meadow Vetchling	R
<i>Leucanthemum vulgare</i>	Oxeye Daisy	R
<i>Lonicera periclymenum</i>	Honeysuckle	R
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil	R
<i>Luzula campestris</i>	Field Wood-rush	R
<i>Malus sylvestris sens. lat.</i>	Apple	R
<i>Malva sylvestris</i>	Common Mallow	R
<i>Matricaria discoidea</i>	Pineappleweed	R
<i>Myosotis sylvatica</i>	Wood Forget-me-not	R
<i>Phleum bertolonii</i>	Smaller Cat's-tail	R
<i>Phleum pratense</i>	Timothy	R
<i>Plantago major</i>	Greater Plantain	R
<i>Poa pratensis</i>	Smooth Meadow-grass	R
<i>Populus tremula</i>	Aspen	R
<i>Potentilla anserina</i>	Silverweed	R
<i>Potentilla erecta</i>	Tormentil	R
<i>Potentilla reptans</i>	Creeping Cinquefoil	R
<i>Prunus avium</i>	Wild Cherry	R
<i>Prunus domestica</i>	Wild Plum	R
<i>Pyrus communis</i>	Pear	R
<i>Quercus robur</i>	Pedunculate Oak	R
<i>Rhinanthus minor</i>	Yellow-rattle	R
<i>Rhododendron ponticum</i>	Rhododendron	R
<i>Ribes nigrum</i>	Black Currant	R
<i>Rorippa palustris</i>	Marsh Yellow-cress	R
<i>Rosa arvensis</i>	Field Rose	R
<i>Rumex acetosa subsp. acetosa</i>	Common Sorrel	R
<i>Rumex crispus</i>	Curled Dock	R

Scientific Name	Common Name	STATUS
<i>Rumex sanguineus</i>	Wood Dock	R
<i>Salix caprea</i>	Goat Willow	R
<i>Salix cinerea</i>	Grey Willow	R
<i>Salix fragilis</i>	Crack-willow	R
<i>Sanguisorba officinalis</i>	Great Burnet	R
<i>Schedonorus pratensis</i>	Meadow Fescue	R
<i>Scorzoneroide autumnalis</i>	Autumn Hawkbit	R
<i>Silene flos-cuculi</i>	Ragged-Robin	R
<i>Silaum silaus</i>	Pepper-saxifrage	R
<i>Sinapis arvensis</i>	Charlock	R
<i>Sisymbrium officinale</i>	Hedge Mustard	R
<i>Solanum dulcamara</i>	Bittersweet	R
<i>Sonchus asper</i>	Prickly Sow-thistle	R
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	R
<i>Sorbus aucuparia</i>	Rowan	R
<i>Stachys sylvatica</i>	Hedge Woundwort	R
<i>Stellaria graminea</i>	Lesser Stitchwort	R
<i>Stellaria media</i>	Common Chickweed	R
<i>Tamus communis</i>	Black Bryony	R
<i>Taxus baccata</i>	Yew	R
<i>Tragapogon pratensis</i>	Goat's-beard	R
<i>Trifolium dubium</i>	Lesser Trefoil	R
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	R
<i>Trisetum flavescens</i>	Yellow Oat-grass	R
<i>Ulmus glabra</i>	Wych Elm	R
<i>Ulmus minor subsp. minor</i>	Small-leaved Elm	R
<i>Ulmus procera</i>	English Elm	R
<i>Veronica beccabunga</i>	Brooklime	R
<i>Veronica chamaedrys</i>	Germander Speedwell	R
<i>Veronica serpyllifolia</i>	Thyme- leaved Speedwell	R
<i>Viburnum lanata</i>	Wayfaring Tree	R
<i>Viburnum opulus</i>	Guelder-rose	R
<i>Vicia sativa subsp. segetalis</i>	Common Vetch	R
<i>Vicia sepium</i>	Bush Vetch	R
<i>Viola riviniana</i>	Common Dog-violet	R

APPENDIX 2 – FIELD SPECIES LIST

Scientific Name	Common Name	Field Reference										
		1	2	3	4	5	6	7	8	9	10	11
<i>Holcus lanatus</i>	Yorkshire-fog	A	A/VLD	A	A	F/LA	O/LA	A	F/LA	A/LD	A	F/LA
<i>Agrostis capillaris</i>	Common Bent	O/LA	R	VR	O/LA	R	R	O	R	R	O	R
<i>Achillea millefolium</i>	Yarrow	O	O/VLF			R					R	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	O	F	F	O	A	F/LA	R/VLF	R/VLF	O	O	
<i>Dactylis glomerata</i>	Cock's-foot	O		R	O	R	R	O	R	R	R	O
<i>Lolium perenne</i>	Perennial Rye-grass	O	O	O/LA	F	O/VLF	O	O	F	O/LF	R	
<i>Plantago lanceolata</i>	Ribwort Plantain	O	O/VLF	VR	O	F	O	O	O	O	O	R
<i>Poa trivialis</i>	Rough Meadow-grass	O	O	F	F	O	O	O	F	F	O	R
<i>Arrhenatherum elatius</i>	False Oat-grass	R/VLA	R						VR			A/LD
<i>Alopecurus pratensis</i>	Meadow Foxtail	R		O/LA	O	O		O	O	O	O	O/LA
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	R	O		O	R	O		R	O	O	R
<i>Centaurea nigra</i>	Common Knapweed	R				R	R	R				
<i>Cerastium fontanum</i>	Common Mouse-ear	R	R	O	O	R	O	O			O	
<i>Cirsium arvense</i>	Creeping Thistle	R	O/LA	R	R	R/VLA		O/LA	F/LA	R/VLF	R	R
<i>Crepis capillaris</i>	Smooth Hawk's-beard	R										
<i>Equisetum arvense</i>	Field Horsetail	R									R	
<i>Heracleum sphondylium</i>	Hogweed	R	R	VR								R
<i>Hypochaeris radicata</i>	Cat's-ear	R	O	R		O/LF	O	O		R	R	
<i>Jacobaea vulgaris</i>	Common Ragwort	R	O	R	R		R	O	R	R		VR
<i>Malva sylvestris</i>	Common Mallow	R										
<i>Poa pratensis</i>	Smooth Meadow-grass	R	R			R				R		
<i>Ranunculus acris</i>	Meadow Buttercup	R	O	O		O	R	O	R	R	O	R
<i>Ranunculus repens</i>	Creeping Buttercup	R	F/LA	A	A	O	O	F/LA	F/LA	F/LA	A	O
<i>Rumex acetosa</i>	Common Sorrel	R	R		R		R	O		R	O	R
<i>Rumex obtusifolius</i>	Broad-leaved Dock	R	F/LA	R	R	R	R	O	LA	LA	R	R
<i>Rubus fruticosus agg.</i>	Bramble	R	R									
<i>Taraxacum agg.</i>	Dandelion	R	R	R	O	R	R	R			R	VR
<i>Trifolium repens</i>	White Clover	R	F/LA	F	F	F/LA	F	O/LA	F	F/LA	F/LA	
<i>Cirsium vulgare</i>	Spear Thistle	VR		R	R		R	R	R	R	R	R
<i>Dipsacus fullonum</i>	Wild Teasel	VR										
<i>Bromus hordeaceus</i>	Soft-brome		O	VR		R	R					
<i>Trifolium pratense</i>	Red Clover		O	F	F	O	O	O/LF	O	O	O/LF	
<i>Urtica dioica</i>	Common Nettle		R/VLD	VR				R/VLA	R	R	R	
<i>Crepis vesicaria</i>	Beaked Hawk's-beard		R		R	R	R					
<i>Elymus repens</i>	Common Couch		R									
<i>Festuca rubra</i>	Red Fescue		R	VR		R	O	R	R		R	R
<i>Matricaria discoidea</i>	Pineappleweed		R			R						
<i>Plantago major</i>	Greater Plantain		R	R	R	R	R	R	O	R	R	
<i>Schedonorus pratensis</i>	Meadow Fescue		R					R	R	O	R	
<i>Trifolium dubium</i>	Lesser Trefoil		R	R	R		R					
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell		R							VR	R	
<i>Arctium lappa</i>	Greater Burdock		VR									
<i>Galium aparine</i>	Cleavers			R								
<i>Phleum bertolonii</i>	Smaller Cat's-tail			R		R		R		R		VR
<i>Phleum pratense</i>	Timothy			R				R			R	
<i>Sonchus oleraceus</i>	Smooth Sow-thistle			R			R					
<i>Glyceria fluitans</i>	Floating Sweet-grass			VR								
<i>Prunella vulgaris</i>	Selfheal				R	O	R	R	R	R	R	

Scientific Name	Common Name	Field Reference										
		1	2	3	4	5	6	7	8	9	10	11
<i>Hordeum secalinum</i>	Meadow Barley				VR	R			VR			
<i>Lathyrus pratensis</i>	Meadow Vetchling				VR						R	
<i>Tragapogon pratensis</i>	Goat's-beard				VR							
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil					O/LA	LA	VR		VR	R	
<i>Capsella bursa-pastoris</i>	Shepherd's-purse					R						
<i>Leucanthemum vulgare</i>	Oxeye Daisy					R						
<i>Polygonum aviculare</i>	Knotgrass					R		R	R	R		
<i>Sanguisorba officinalis</i>	Great Burnet					R					R	
<i>Poa annua</i>	Annual Meadow-grass					R		R	R	R		
<i>Potentilla erecta</i>	Tormentil					R						
<i>Rhinanthus minor</i>	Yellow-rattle					R						
<i>Scorzoneroide autumnalis</i>	Autumn Hawkbit					R	R					
<i>Silaum silaus</i>	Pepper-saxifrage					R						
<i>Trisetum flavescens</i>	Yellow Oat-grass						R					
<i>Juncus inflexus</i>	Hard Rush						VR					
<i>Bellis perennis</i>	Daisy							R		R		
<i>Stellaria graminea</i>	Lesser Stitchwort							R			R	
<i>Avenula pubescens</i>	Downy Oat-grass							R				
<i>Alopecurus geniculatus</i>	Marsh Foxtail								R	R		
<i>Juncus articulatus</i>	Jointed Rush								R	R/VLF	R	
<i>Deschampsia cespitosa</i>	Tufted Hair-grass								VR		R	
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort								VR			
<i>Stachys sylvatica</i>	Hedge Woundwort								VR			
<i>Carex nigra</i>	Common Sedge									R		
<i>Juncus bufonius</i>	Toad Rush									R	R	
<i>Glyceria notata</i>	Plicate Sweet-grass									R		
<i>Cirsium palustre</i>	Marsh Thistle									R		
<i>Conopodium majus</i>	Pignut									VR	R	
<i>Danthonia decumbens</i>	Heath-grass									VR		
<i>Silene flos-cuculi</i>	Ragged-Robin									VR		
<i>Epilobium hirsutum</i>	Great Willowherb										R/VLA	
<i>Juncus effusus</i>	Soft-rush										R	VR
<i>Carex hirta</i>	Hairy Sedge										R	
<i>Carex leporina</i>	Oval Sedge										R	
<i>Epilobium obscurum</i>	Short-fruited Willowherb										R	
<i>Jacobaea aquatica</i>	Marsh Ragwort										R	
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil										R	
<i>Luzula campestris</i>	Field Wood-rush										R	
<i>Schedonorus arundinaceus</i>	Tall Fescue										R	
<i>Anthriscus sylvestris</i>	Cow Parsley											R
<i>Potentilla anserina</i>	Silverweed											R
<i>Rumex crispus</i>	Curled Dock											R
Total Species		30	34	29	26	39	31	33	31	39	46	23
Indicator Species (Neutral Grassland)		3	3	2	3	10	6	5	2	6	9	2
Indicator Species (Other Grasslands)		1	1	1	1	1	1	1	2	6	5	2

Nb1. Species highlighted in Green are LWS Neutral Grassland Indicator Species. Those highlighted blue are LWS indicator species for other types of grassland.

APPENDIX 3 – HEDGEROW SURVEY RESULTS

Hedgerow Reference		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Length (m)		45	50	95	75	130	70	55	80	145	225	65	75	140	150	90	75	95	95	125	120
Height (m)		3-6	4-8	5-10	3-5	4-9	6-8	6-7	4-6	4-7	3-6	3-7	3-8	3-9	8+	5-7	6-8	5-6	4-8	6-10	3-9
Width (m)		2-3	1.5-3	3-9	2-5	2-5	3-8	6-8	2-4	3-5	2-5	2-5	2-6	3-6	8-10	10+	8-12	3	4-8	5-8	2-7
Structure		Defunct	Poor	Average	Good	Good	Average	Poor	Poor	Average	Average	Average	Average	Poor	Average	Average	Average	Good	Average	Average	Average
Species																					
Scientific Name	Common Name																				
<i>Acer campestre</i>	Field Maple									Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	
<i>Cornus sanguinea</i>	Dogwood																				
<i>Corylus avellana</i>	Hazel					Yes	Yes				Yes	Yes	Yes	Yes						Yes	
<i>Crataegus monogyna</i>	Hawthorn		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fraxinus excelsior</i>	Ash				Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes
<i>Ilex aquifolium</i>	Holly		Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes		Yes		Yes		Yes
<i>Lonicera periclymenum</i>	Honeysuckle								Yes	Yes			Yes								
<i>Malus sylvestris sens. lat.</i>	Apple									Yes			Yes								
<i>Populus tremula</i>	Aspen			Yes																	
<i>Prunus avium</i>	Wild Cherry			Yes										Yes						Yes	
<i>Prunus domestica</i>	Wild Plum																	Yes	Yes		
<i>Prunus spinosa</i>	Blackthorn	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
<i>Pyrus communis</i>	Pear																		Yes		
<i>Quercus robur</i>	Pedunculate Oak			Yes			Yes		Yes	Yes		Yes	Yes		Yes						
<i>Rosa arvensis</i>	Field Rose									Yes											
<i>Rosa canina</i>	Dog-rose	Yes			Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<i>Salix caprea</i>	Goat Willow										Yes										
<i>Salix cinerea</i>	Grey Willow					Yes					Yes						Yes		Yes	Yes	Yes
<i>Salix fragilis</i>	Crack-willow					Yes									Yes						
<i>Sambucus nigra</i>	Elder	Yes	Yes	Yes		Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
<i>Sorbus aucuparia</i>	Rowan									Yes											
<i>Ulmus glabra</i>	Wych Elm													Yes	Yes		Yes	Yes			Yes
<i>Ulmus minor subsp. minor</i>	Small-leaved Elm																		Yes	Yes	
<i>Ulmus procera</i>	English Elm	Yes		Yes			Yes								Yes					Yes	Yes
<i>Viburnum lantana</i>	Wayfaring Tee																				
<i>Viburnum opulus</i>	Guelder-rose										Yes										
Total Species		4	3	8	5	8	8	4	6	10	11	9	10	8	10	5	9	7	10	10	7
30m Sample 1		N/A	C.mo, S.ni	C.mo, P.sp, S.ni,	C.mo, I.aq, F.ex, R.ca	C.mo, C.av, F.ex, I.aq, R.ca, S.ni	C.mo, C.av. I.aq, P.sp	C.mo, F.ex, I.aq, P.sp	L.pe, P.sp, S.ni	C.mo, F.ex, L.pe, P.sp, R.ca,	A.ca, C.av, C.mo, S.ni, V.op	A.ca, P.do, P.sp, R.ca, S.ni,	C.mo, F.ex, L.pe, P.sp,	C.mo, P.av, R.ca, U.gl	A.ca, C.mo, F.ex, R.ca, S.ni,	C.mo, F.ex, R.ca, S.ni	A.ca, C.mo, P.sp, R.ca	A.ca, C.mo, P.do, P.sp, R.ca, S.ni	C.mo, I.aq, P.sp, R.ca, S.ni	C.av, C.mo, P.sp, R.ca, U.pr	C.mo, I.aq, S.ni, U.gl
30m Sample 2					C.mo	C.mo, C.av, F.ex, S.ci, S.ni,			C.mo, P.sp, S.ni	C.mo, F.ex, M.sy, P.sp, R.ca	C.av, C.mo, F.ex, V.op			C.mo, F.ex, I.aq, S.ni	C.mo, F.ex, P.sp, Q.ro, S.fr, U.pr,					A.ca, C.mo, P.av, S.cin	C.mo, P.sp

Hedgerow Reference		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
30m Sample 3											C.mo, F.ex, I.aq, P.sp, Q.ro, S.ni,										
Av. Sp/30m Sample			2	3	2.5	5.5	4	4	3	5	5	5	4	4	5.5	4	4	6	5	4.5	3
Woodland Ground Flora																					
<i>Arum maculatum</i>	Lords-and-Ladies				Yes	Yes		Yes		Yes					Yes	Yes	Yes			Yes	Yes
<i>Bromopsis ramosa</i>	Hairy-brome														Yes						
<i>Conopodium majus</i>	Pignut					Yes							Yes								
<i>Dryopteris dilatata</i>	Broad Buckler-fern			Yes		Yes					Yes		Yes								
<i>Dryopteris filix-mas</i>	Male-fern					Yes	Yes						Yes								
<i>Geranium robertianum</i>	Herb-Robert																	Yes			
<i>Geum urbanum</i>	Wood Avens		Yes	Yes	Yes					Yes	Yes		Yes	Yes	Yes			Yes	Yes	Yes	Yes
<i>Mercurialis perennis</i>	Dog's Mercury										Yes						Yes				
Total Woodland Species		0	1	2	2	4	1	1	0	2	3	0	4	1	3	1	2	2	1	2	2
Associated Features																					
Wall or bank		No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ditch		No	No	No	No	Yes	No	No	No	No	Yes	Yes	Yes	Def	No	No	No	No	No	No	No
Av. 1 tree per 50m		Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
<10% gaps		Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3 Woodland Species		No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	No	No	No
Parallel hedge within 15m		No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Connectivity score of 4+		No	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No
Total Features		2	1	2	2	4	2	1	1	3	4	3	4	3	4	2	2	2	2	3	2
Important (Yes/No)		No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No

APPENDIX 4 – SPECIES RECORDED DURING THE BREEDING BIRD SURVEY

Land East of the Common, Barwell: Appendix 4 - Birds Species List

Scientific Name	Common Name	STATUS
<i>Accipiter nisus</i>	Sparrowhawk	NB
<i>Aegithalos caudatus</i>	Long-tailed Tit	B
<i>Apus apus</i>	Swift	NB
<i>Buteo buteo</i>	Common Buzzard	NB
<i>Carduelis carduelis</i>	Goldfinch	B
<i>Chloris chloris</i>	Greenfinch	B
<i>Coloeus monedula</i>	Jackdaw	PB
<i>Columba oenas</i>	Stock Dove	PB
<i>Columba palumbus</i>	Woodpigeon	B
<i>Corvus corone</i>	Carrion Crow	B
<i>Curruca communis</i>	Whitethroat	B
<i>Cyanistes caeruleus</i>	Blue Tit	B
<i>Erithacus rubecula</i>	Robin	B
<i>Falco tinnunculus</i>	Kestrel	NB
<i>Fringilla coelebs</i>	Chaffinch	B
<i>Garrulus glandarius</i>	Jay	NB
<i>Hirundo rustica</i>	Swallow	NB
<i>Larus fuscus</i>	Lesser Black-backed Gull	NB
<i>Motacilla alba</i>	Pied Wagtail	BA
<i>Parus major</i>	Great Tit	B
<i>Passer domesticus</i>	House Sparrow	BA
<i>Picus viridis</i>	Green Woodpecker	NB
<i>Phasianus colchicus</i>	Pheasant	PB
<i>Phylloscopus collybita</i>	Chiffchaff	B
<i>Pica pica</i>	Magpie	B
<i>Prunella modularis</i>	Dunnock	B
<i>Pyrrhula pyrrhula</i>	Bullfinch	B
<i>Sitta europaea</i>	Nuthatch	NB
<i>Streptopelia decaocto</i>	Collared Dove	B
<i>Sturnus vulgaris</i>	Starling	B
<i>Sylvia atricapilla</i>	Blackcap	B
<i>Troglodytes troglodytes</i>	Wren	B
<i>Tyto alba</i>	Barn Owl	NB
<i>Turdus merula</i>	Blackbird	B
<i>Turdus philomelos</i>	Song Thrush	B
<i>Turdus viscivorus</i>	Mistle Thrush	B

B = Breeding, PB = Possibly Breeding, BA = Breeding Adjacent to Site, NB = Non-breeding

APPENDICES 5A-5D – PHOTOGRAPHIC RECORD



FIELD 1



FIELD 2



FIELD 3



FIELD 4



FIELD 5



FIELD 6



FIELD 7



FIELD 8



FIELD 9



FIELD 10



FIELD 11



HEDGEROW 1



HEDGEROW 2



HEDGEROW 3



HEDGEROW 4



HEDGEROW 5



HEDGEROW 6



HEDGEROW 7



HEDGEROW 8



HEDGEROW 9



HEDGEROW 10



HEDGEROW 11



HEDGEROW 12



HEDGEROW 13



HEDGEROW 14



HEDGEROW 15



HEDGEROW 16



HEDGEROW 17



HEDGEROW 18



HEDGEROW 19



HEDGEROW 20



OPEN GROUND/RUDERALS, ENTRANCE TO FIELD 1



TALL RUDERALS AROUND BUILDINGS IN FIELD 2



FIELD 5, SCRUB/RUDERALS ALONG W BOUNDARY



DITCH ASSOCIATED WITH HEDGEROW 10



FIELD 10, DAMP SECTION



FIELD 11, NUTRIENT ENRICHED MOUND



BUILDING 1



BUILDING 2



BUILDING 3



BUILDING 4



BUILDING 5



BUILDING 6



BUILDING GROUP 7