MKA
ECOLOGY

Preliminary Ecological Appraisal

Land at Water Lane, Melbourn

Site	*Land at Water Lane, Melbourn*
Project number	*115121*
Client name / Address	Tim Sills, Broadoaks Manor, Thaxted Road, CB10 2XR

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Author(s)	*Megan Stigling*	Megan Stigling
Surveyor(s)	*Gabrielle Wilbur ACIEEM*	Gabrielle Wilbur
Reviewed by	Will O'Connor CEcol MCIEEM	W O'Connor
Contact	*MKA Ecology Limited, 01763 262211, info@mkaecology.co.uk*	

Declaration of compliance

This Preliminary Ecological Appraisal has been undertaken in accordance with British Standard 42020:2013 "Biodiversity, Code of practice for planning and development". The information which we have provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

MKA Ecology Ltd is a CIEEM Registered Practice. This means that MKA Ecology Ltd are formally recognised for high professional standards, working at the forefront of our profession.

Validity of data

Unless stated otherwise the information provided within this report is valid for a maximum period of 24 months from the date of survey. If works at the site have not progressed by this time an updated site visit may be required in order to determine any changes in site composition and ecological constraints.

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1. EXECUTIVE SUMMARY

In August 2021 MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal of Land at Water Lane, Melbourn. The appraisal included a habitat survey, protected species scoping survey and desktop study of protected and notable sites and species in the area. A site visit was undertaken on 10 August 2021.

The Site comprises a single arable field bordered by native hedgerow to the north, east and south. This area is to be promoted for residential development within the Greater Cambridge Local Plan.

The Site lies within Natural England SSSI Impact Risk Zones for Fowlmere Watercress Beds SSSI which is designated for its relic fen habitat. Potential impacts largely relate to additional recreational pressure which should be mitigated for by the provision of adequate recreational space within the development.

The following ecological constraints were identified at the Site with recommendations made as follows;

- **Habitat**: Two Habitats of Principal Importance are present on site (hedgerows and arable field margin). These should be retained, protected and enhanced within the new development.
- **Plants**: The Site supports areas of arable field margin which are suitable for rare arable plant species. Several notable species were identified onsite and it is therefore recommended that a full botanical survey is completed.
- **Badger**: An active sett is present and suitable foraging and sett building habitat is present within the surrounding area. It is recommended that that either a 30m buffer zone is established around this, or the sett is closed through a licence from Natural England. A pre-commencement badger survey prior to works is also recommended to check if new setts have been established.
- **Bats**: Suitable roosting, foraging and commuting habitat is present onsite. Two trees were identified along the eastern border as having a low potential to support roosting bats. If the development does not impact these trees or the hedgerows onsite then no further surveys will be required.
- **Birds**: Suitable breeding bird habitat is present within the hedgerows onsite. As the area is known as a stronghold for corn bunting and could support other notable arable species. It is recommended that a reduced effort of three breeding bird surveys are completed between March and August to allow a proper assessment of the breeding bird assemblage. Vegetation and building clearance works should be scheduled between the months of September and February inclusive to avoid direct impacts on nesting birds.
- **Brown Hare**: Suitable habitat was identified within the arable field. It is recommended that ground clearance should avoid brown hare breeding season or a pre-development check for forms/ leverets should be undertaken.

- **Reptiles**: Suitable habitat for reptiles was identified within the tussocky grassland bordering the Site and in the adjacent grassland. It is recommended that reptile surveys are undertaken to establish the presence or likely absence of reptile species on site (March to September with the optimal months of April, May and September).

Opportunities exist to enhance the biodiversity on the site post-development. The biggest opportunity to incorporate areas of open greenspace exist in the creation of an orchard. As well as reducing the recreational pressure on Fowlmere Watercress Beds SSSI this will also increase the Sites connectivity to the surrounding similar habitats. An opportunity is also present to incorporate areas of wildflower planting into amenity grassland and garden habitats while additional tree and shrub planting will also enhance the Site. Bird and bat boxes should also be included within the new development and should be detailed within a Landscape and Ecological Management Plan (LEMP).

2. INTRODUCTION

2.1. Aims and scope of Preliminary Ecological Appraisal

In August 2021 MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal at Land at Water Lane, Melbourn by Tim Sills in order to support the promotion of the Site for residential development in the Greater Cambridge Local Plan

The aims of the Preliminary Ecological Appraisal were to:

- Undertake a desktop study to identify the extent of protected and notable species and habitats within close proximity of the Site;
- Prepare a habitat map for the Site;
- Identify evidence of protected species/species of conservation concern at the Site;
- Assess the potential impacts of the proposed development, using existing plans;
- Detail recommendations for further survey effort where required; and
- Detail recommendations for biodiversity enhancements.

2.2. Site description and context

The survey area is shown on the map in Figure 1. Within this report this area is referred to as the Site or Land at Water Lane. The Site is located to the south of Melbourn and is under the authority of South Cambridgeshire District Council. The Site comprises of an arable field surrounded by native hedgerow with ruderal dominated field boundaries and arable field margins.

2.3. Proposed development

The client proposes to promote the area of land for residential development within the Greater Cambridge Local Plan.

2.4. Legislation and planning policy

This Preliminary Ecological Appraisal has been undertaken with reference to relevant wildlife legislation and planning policy.

Relevant legislation considered within the scope of this document includes the following:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2017 (as amended);

- Natural Environment and Rural Communities (NERC) Act 2006;
- The Countryside and Rights of Way (CRoW) Act 2000;
- Protection of Badgers Act 1992; and
- Wild Mammals (Protection) Act 1996.

Further information is provided in Appendix 1, including levels of protection granted to the species considered in Section 3.3.

In addition to obligations under wildlife legislation, the revised National Planning Policy Framework (NPPF) updated on 20 July 2021 requires planning decisions to contribute to conserving and enhancing the local environment. Further details are provided in Appendix 1.

South Cambridgeshire District Council has adopted a Local Plan which covers a number of policies relating to biodiversity and habitat conservation, including: new developments, brownfield sites, protected species and habitats, green infrastructure, ancient woodland/veteran trees and greenbelt development (SCDC, 2018).

Policy NH/4: Biodiversity:

1. Development proposals where the primary objective is to conserve or enhance biodiversity will be permitted.
2. New development must aim to maintain, enhance, restore or add to biodiversity. Opportunities should be taken to achieve positive gain through the form and design of development. Measures may include creating, enhancing and managing wildlife habitats and networks, and natural landscape. The built environment should be viewed as an opportunity to fully integrate biodiversity within new development through innovation. Priority for habitat creation should be given to sites which assist in the achievement of targets in the Biodiversity Action Plans (BAPs) and aid delivery of the Cambridgeshire Green Infrastructure Strategy.
3. If significant harm to the population or conservation status of a Protected Species, Priority Species1 or Priority Habitat resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission will be refused.
4. Where there are grounds to believe that a proposal may affect a Protected Species, Priority Species or Priority Habitat, applicants will be expected to provide an adequate level of survey information and site assessment to establish the extent of a potential impact. This survey information and site assessment shall be provided prior to the determination of an application.

Where relevant these are discussed in further detail in Section 5.

3. METHODOLOGIES

This Preliminary Ecological Appraisal has been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal, 2nd edition (CIEEM, 2017).

3.1. Desktop study

A data search was conducted for the Site and the surrounding area within 2km. Data was retrieved from the sources listed in Table 1.

Table 1: Sources of data for desktop study

Organisation	Data collected	Date collected
Multi-agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk	Information on local, national and international statutory protected areas.	24/08/2021
Cambridgeshire and Peterborough Environmental Records Centre	Information on protected and notable sites and species within 2km of the Site (TL 38599 43768).	16/08/2021
Ordnance Survey maps and aerial photography	Information on habitats and connectivity between the Site and the surrounding landscape	16/08/2021
Plantlife Important Plant Areas Buglife Important Invertebrate Areas	Information on important plant and invertebrate areas within 2km of the Site.	24/08/2021

South Cambridgeshire planning portal was also referred to in order to understand the scope of further development surrounding the Site.

3.2. UK Habitat Classification

Habitats were surveyed using the standardised UK Habitat classification and mapping methodology (UK Habs) (Butcher et al, 2020). Data were recorded onto field maps and then transferred onto a Geographic Information System (GIS) following the UK Habs Colour Mapping Pallet for ArcGIS. Dominant plant species were observed and recorded within each habitat type. The plant species nomenclature follows that of Stace (2019).

The DAFOR scale is used to describe the relative abundance of species. The scale is shown in Table 2. It is important to note that where a species is described as rare this description refers to its relative

abundance within the Site and is not a description of its abundance within the wider landscape. Therefore, a species with a rare relative abundance within the Site may be common within the wider landscape.

Table 2: DAFOR scale

DAFOR code	Relative abundance
D	Dominant
A	Abundant
F	Frequent
O	Occasional
R	Rare

3.3. Protected and notable species scoping survey

As part of the Preliminary Ecological Appraisal, an assessment of the potential for the habitats on site to support protected or notable species was made. This assessment was based on the quality, extent and interconnectivity of suitable habitats, along with the results of the desktop study detailed in Section 3.1. The potential to support rare or notable species is also considered. This includes Species of Principal Importance as listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006), and Red and Amber listed Birds of Conservation Concern (BoCC) as per Eaton *et al.*, 2015 (see Appendix 1).

Protected and notable species considered within the protected species scoping survey for Water Lane, Melbourn include the following:

- Plants and fungi: Basil thyme *Clinopodium acinos*, fine-leaved fumitory *Fumaria parviflora* and dwarf spurge *Euphorbia exigua*.
- Invertebrates: Grey dagger *Acronicta psi*
- Fish: European eel *Anguilla anguilla*, river lamprey *Lampetra fluviatilis*, brown trout *Salmo trutta subsp. fario*.
- Amphibians: Natterjack toad *Epidalea calamita*, great crested newt *Triturus cristatus* and common toad *Bufo bufo*.
- Reptiles: Adder *Vipera berus*, common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix helvetica*.
- Birds: All species, with special reference to species listed under Schedule 1 of The Wildlife and Countryside Act 1981 (as amended).

- Mammals: Badger *Meles meles*, bats (all species), water vole *Arvicola amphibius*, otter *Lutra lutra*, hazel dormouse *Muscardinus avellanarius*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, harvest mouse *Micromys minutus* and polecat *Mustela putorius*.

In each case the likelihood of presence of these protected species at the Site was classified as being either confirmed, high, moderate, low or negligible.

Confirmed: The species is confirmed on the site during the Preliminary Ecological Appraisal, previous survey effort or recent records.

High: Habitats are available onsite which are highly suitable for this species and there are records within the desktop study. The surrounding areas also provide widespread opportunities for the species which are well connected to the Site.

Moderate: Some suitable habitat available on site for the species although not of optimum quality. Species is present with the desktop study.

Low: Some suitable habitat available on site for the species but this is low value and possibly of small scale or with poor connectivity. No, or very few, records returned in the desktop study.

Negligible: No suitable habitat available for the species, or very little poor-quality habitat.

This protected species scoping survey is designed to assess the *potential* for presence or absence of a particular species or species group, and does not constitute a full survey for these species.

3.4. Surveyor, author and reviewer

The survey was undertaken by Megan Stigling, Graduate Ecologist at MKA Ecology Limited and Gabrielle Wilbur ACIEEM, Senior Ecologist at MKA Ecology. The report was written by Megan Stigling. The report has been reviewed by Will O'Connor CEcol MCIEEM, Director and Principal Ecologist at MKA Ecology Ltd. Will has over ten years' experience as a consultant ecologist.

3.5. Date, time and weather conditions

See Table 3 below for details of the date, time and prevailing weather conditions recorded during the site visit for the Preliminary Ecological Appraisal.

Table 3: Date, time and weather conditions of survey visit

Date	Time of survey	Weather conditions*
09/08/2021	11:00	Wind: 2 Cloud: 3 Temp: 17ºC Rain: None

*Wind as per Beaufort Scale / Cloud cover given in Oktas.

3.6. Constraints

A single visit cannot always ascertain the presence or absence of a protected species. However, an assessment is made of the likelihood for protected species to occur based on habitat characteristics and the ecology of each species. Where there is potential for protected species, additional survey work may be required to ascertain their presence or absence.

Data on species records obtained from local biological records centres are sometimes only available at low spatial resolutions and are constrained by the voluntary nature of the contributions and what has been chosen to be submitted as records. While these records provide a useful indication of species recorded in the local area, in particular protected or notable species, the data is not necessarily an accurate reflection of species assemblages or abundance in the vicinity.

4. RESULTS

4.1. Desktop study

An ecological desktop study was completed for the Site and the surrounding 2km. Data provided by Cambridgeshire and Peterborough Environmental Records Centre identified a small number of UK and European protected species, Species and Habitats of Principal Importance (as listed under Section 41 of the NERC Act 2006), and species of conservation concern within 2km of the Site. It should be noted that this is not a comprehensive list of the distribution or extent of the local flora and fauna of conservation importance. These species records are discussed in greater detail in the protected species scoping survey section (Section 4.3 below).

Details of statutorily designated sites identified as part of the desktop study are displayed in Table 4 below. These consist of two Sites of Special Scientific Interest (SSSI).

Table 4: Statutorily designated sites within 2km of land at Water Lane

Site name*	Area (ha)	Distance and direction	Reasons for selection
Fowlmere Watercress Beds SSSI	39.85	1.8km north-east	Fowlmere nature reserve is set within farmland. It contains relic fen habitat which is now reedbed, chalk grassland and natural chalk springs.
Holland Hall Railway Cutting SSSI	3.33	2km east	The SSSI is located on the verge of an active railway line. The verge consists of steeply sloping chalk grassland and contains a variety of notable plant species such as giant pignut *Conopodium majus*.

No non-statutorily designated sites were identified within 2km of the Site. Melwood Local Nature Reserve is located 2.5km north of the Site and consists of 0.5 ha of open woodland dominated by ash and hawthorn and adjacent riverside habitat.

The Site is located to the south of Melbourn village which is located in the south-west of Cambridgeshire. The Site is immediately surrounded by residential housing to the north and larger arable fields to the east, south and west. There are no areas within 2km of the Site that are designated as Important Plant Areas by Plantlife or Important Invertebrate Areas by Buglife.

The Site lies within Natural England SSSI Impact Risk Zones for Fowlmere Watercress Beds SSSI (Natural England, 2019). All new housing developments will require LPA consultation with Natural England on the potential recreational pressure on relevant SSSIs and measures to mitigate adverse impacts e.g. alternative open space provision.

There are numerous developments occurring in the surrounding areas although the majority of cases relate to smaller householder applications.

4.2. UK Habitat Classification

The Site was found to comprise of an arable field bordered by native hedgerow. More detailed species lists, along with their relative abundance, can be found in Appendix 2. The UK habitat classification survey map is provided in Figure 1 at the end of this section. Descriptions of the habitat types present along with dominant species compositions are provided below.

Arable and horticulture (c1)
The majority of the Site consisted of an arable field (Photograph 1. Appendix 3) containing barley, wheat, oat and millet and appeared to be in active cultivation.

Arable field margins (c1a)
The field margins (Photograph 4, Appendix 3) were dominated by tussocky grasses such as barren brome *Anisantha sterilis* and cock's-foot *Dactylis glomerata* with a range of herbs including white bryony *Bryonia dioica*, greater burdock *Arctium lappa*, stinking iris *Iris foetidissima*, ribwort plantain P*lantago lanceolata*, dandelion *Taraxacum* sp., bristly oxtongue *Picris echioides*, nettle *Urtica dioica*, white dead-nettle *Lamium album* and scentless mayweed *Tripleurospermum inodorum*. The arable field itself contained several species of interest such as rough poppy *Papaver hybridum*, sharp-leaved fluellen *Kickxia elatine* and dwarf spurge *Euphorbia exigua*.

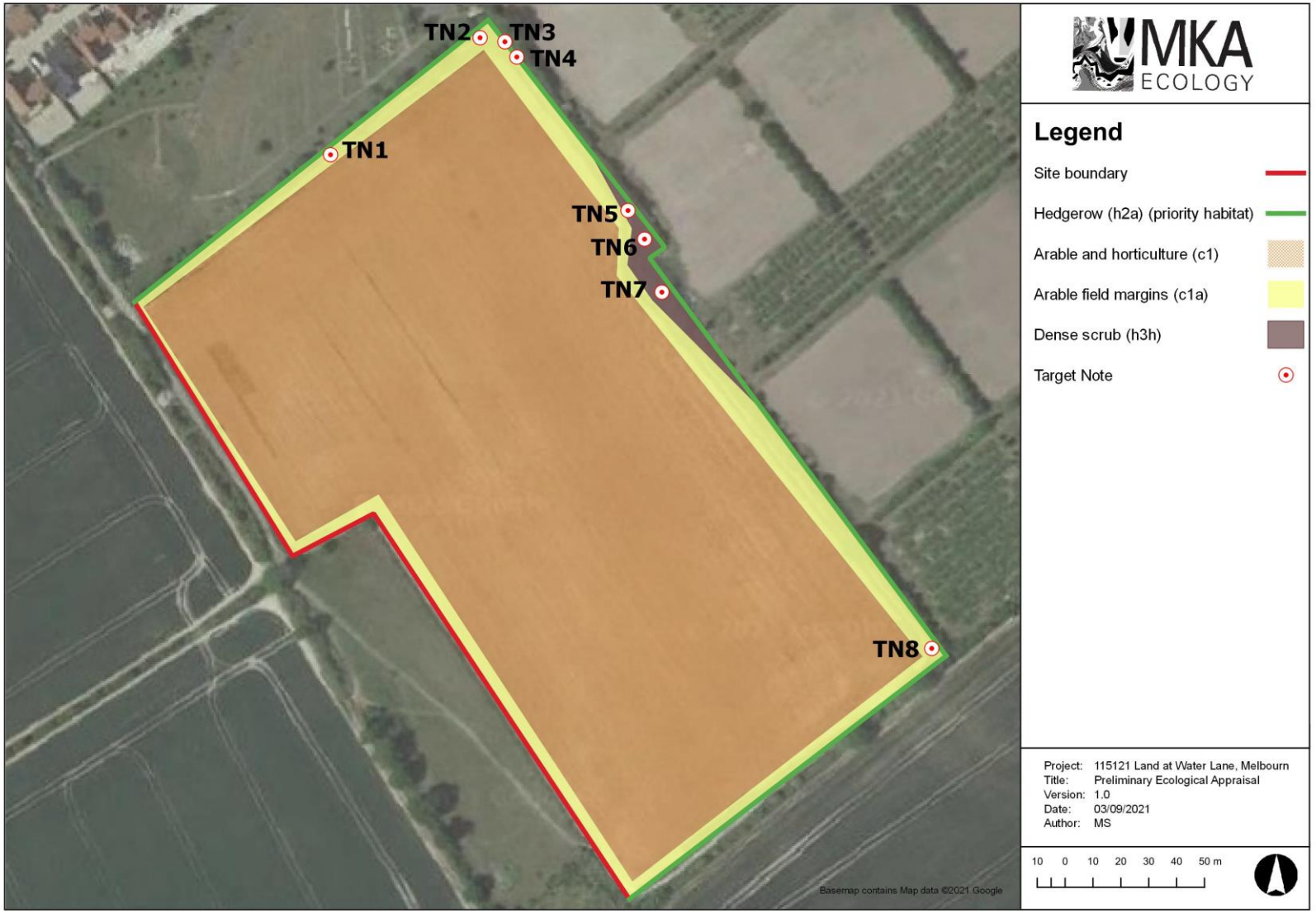
Hedgerow (h2a) (priority habitat)
The Site was bordered by native hedgerow along the northern, eastern and southern boundaries.

- Hedgerow 1 (Photograph 2, Appendix 3) is present along the northern border and consists of frequently occurring field maple *Acer campestre*, with occasional bramble *Rubus fruticosus agg*., hawthorn *Crataegus monogyna* and pedunculate oak *Quercus robur*. Smaller sections of dogrose *Rosa canina* and ash *Fraxinus excelsior* were also noted throughout the hedgerow.
- Hedgerow 2 (photograph 7, Appendix 3) is present along the eastern border and is dominated by plum *Prunus sp* with frequently occurring field maple and occasional walnut *Juglans regia*.
- Hedgerow 3 (photograph 10, Appendix 3) is present along the southern boundary and is dominated by plum with frequent bramble cover.

Dense scrub (h3h)

A small area of dense scrub is present to the east of the Site and was largely dominated by bramble with frequent areas of greater knapweed *Centaurea scabiosa*, creeping thistle *Cirsium arvense* and mugwort *Artemisia vulgaris*.

Figure 1: UK Habitat Classification map of Land at Water Lane, Melbourn



Target notes: **TN1:** Disused badger sett, **TN2:** Log pile, **TN3:** Tree 1, **TN4:** Tree 2, **TN5:** Log pile**, TN6:** Badger sett, **TN7:** Badger sett, **TN8:** Grass pile.

4.3. Protected species scoping survey

Plants and fungi

The data search recorded a moderate amount of protected or notable plant species records within 2km of the Site. This included plants listed on Section 41 of the NERC Act (2006), endangered or vulnerable on the IUCN Red List and Cambridgeshire Additional Species of Interest such as cornflower *Centaurea cyanus*, fine-leaved fumitory *Fumaria parviflora* and small scabious *Scabiosa columbaria*.

A high diversity of flowering plants were recorded in the grassy arable field margins. This habitat type is known to be important for supporting rare or vulnerable plant species. The arable field itself contained several species of interest such as rough poppy *Papaver hybridum*, sharp-leaved fluellen *Kickxia elatine* and dwarf spurge *Euphorbia exigua* (which is on the VC55 Rare Plant Register). Overall given the habitats present onsite and the presence of these species, the risk of supporting protected or notable plant species is considered to be **high**.

Invertebrates

The data search returned three records of invertebrates within 2km of the Site. These included two records of grey dagger *Acronicta psi* in 2004 and one record of cinnabar moth *Tyria jacobaeae* in 2006.

Overall, the majority of the Site is in arable cultivation and not considered suitable for supporting notable populations of invertebrates. However, areas such as the hedgerows, scrub and grassland located directly east of the Site contained a higher plant diversity and as such are considered to have **low** potential to support notable invertebrate populations.

Fish

No records of fish were returned from the data search and no suitable waterbodies identified within the Site. As such there is a **negligible** likelihood of protected or notable fish species being present onsite.

Amphibians

The data search returned two records of common frog within 2km of the Site, these were recorded in 2010 and 2017 in Melbourn and Meldreth.

A search of Defra's MAGIC website returned no European Protected Species Licences granted for great crested newt within 2km of the Site. The closest European Protected Species Licences was granted 3km west of the Site boundary in 2014. Ordnance survey maps and aerial photographs were consulted for the presence of suitable waterbodies for amphibians within 500m of the Site boundary and none were identified. The closest pond appears to be located 1.3km north-west of the Site.

The Site does contain habitat that is suitable for amphibians such as within the tussocky grass bordering the Site and the grassland area directly adjacent to the west of the Site. Deadwood features, rubble

and several log piles were identified within the Site (Target note 5, Appendix 3, photograph 5). However, the lack of historic records of great crested newts and the lack of suitable waterbodies within 500m of the Site boundary reduces the likelihood of this species being present onsite. There is therefore a **negligible** risk of this species being present onsite.

Reptiles

Low numbers of reptiles were returned by the data search, one record of grass snake (recorded 1.2km north) and two records of common lizard (recorded 1.2km north and 1.5km west) were found within 2km of the site.

The tall grassland adjacent the Site and the orchard located to the east of the Site are both suitable for common reptile species which combined with the smaller areas of scrub could provide suitable habitat for reptiles during all stages of their life history. Multiple log piles and areas of rubble were also noted throughout the site which could provide both suitable resting and hibernation places as well as potential breeding habitat for gras snake (Appendix 3: photograph 5, photograph 8). The site has a **high** suitability for reptiles.

Birds

Seven species were recorded during the site visit. These species are shown in Table together with their conservation status. It is important to note that this is not a full inventory of species for the site.

Table 5: Bird species recorded during site visit at Land at Water Lane, Melbourn

Common name	Systematic name	S1 W&CA[1]	BoCC[2] Status	S41 SPI[3]	Local PrSp[4]
Woodpigeon	*Columba palumbus*	-	Green	-	-
Magpie	*Pica pica*	-	Green	-	-
Carrion crow	*Corvus corone*	-	Green	-	-
Great tit	*Parvus major*	-	Green	-	-
Wren	*Troglodytes troglodytes*	-	Green	-	-
Robin	*Erithacus rubecula*	-	Green	-	-
Yellowhammer	*Emberiza citrinella*	-	Red	Yes	Yes

[1] Schedule 1 of The Wildlife and Countryside Act 1981 (see Appendix 1)
[2] Birds of Conservation Concern (see Appendix 1)
[3] Section 41 (NERC Act 2006) 'Species of Principal Importance' (see Appendix 1)
[4] Local Priority Species

The data search returned records of numerous bird species within the search area. These included species listed on Annex 1 of the Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981, Section 41 of the NERC Act, and birds listed as Amber or Red on the BoCC Red list.

A total of 17 records of barn owl *Tyto alba* were returned by the data search although the Site is unlikely to support roosting/nesting barn owl due to the lack of mature trees. However, the surrounding countryside provides good foraging habitat.

The data search also included numerous records of farmland species such as skylark *Alauda arvensis*, corn bunting *Emberiza calandra*, quail *Coturnix coturnix*, linnet *Linaria cannabina* and grey partridge *Perdix perdix* (which are all listed as either Red or Amber on the BoCC Red List). None of these species were recorded onsite although both quail and corn bunting are known to breed in the surrounding areas. The Site may also provide some habitat for overwintering fieldfare *Turdus pilaris* and redwing *Turdus iliacus* (both listed in the data search and both listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)).

Tree sparrow *Passer montanus*, bullfinch *Pyrrhula pyrrhula* and turtle dove *Streptopelia turtur* records were returned within the data search, and the grassland boundaries, scrub and arable field onsite and the adjacent arable fields, orchard and grasslands may provide habitat for these species The Site is considered to have the potential to support locally significant numbers of these species due to the availability of suitable grassland and arable habitat. However, the availability of larger areas of similar habitat types in the area may reduce the importance of the Site for these species.

The Site contains suitable breeding and wintering bird habitat including arable field, hedgerow and scrub. The likelihood of the Site to support breeding and overwintering birds is considered to be **high**. As both quail and corn bunting are known to breed within the area, the likelihood of the Site supporting important local assemblages of bird species, or protected and notable bird species, is considered to be **moderate**.

Bats

A total of 29 records of bats were returned from the data search including Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bat *Plecotus auritus*. The hedgerows bordering the Site boundary provide potential commuting habitat and connects the housing development to the north of the Site to the surrounding arable fields. Although the Site itself provides sub-optimal foraging habitat, it is likely to support arable insect pests which could be used by bats for foraging. The adjacent orchard and areas of grassland is likely to provide better foraging habitat for a range of bat species.

A search of Defra's MAGIC website returned three European Protected Species Licences granted for the destruction of brown long-eared bat and common pipistrelle non-breeding roost (licence period

November 2014 to December 2019), the destruction of common pipistrelle non-breeding roost (licence period May 2013 to August 2014) and the destruction of common pipistrelle and Natterer's non-breeding roost (licence period October 2012 to September 2014) within 2km of the Site. The licences were granted 1.1km, 1.2km and 1.6km north of the Site.

A mature oak and a mature plum were noted to contain potential roosting features. The mature plum contained a small wound on the south facing aspect which could be used by smaller species of bat such as common pipistrelle. The mature oak tree was noted to contain a large amount of ivy cover which could obscure potential roosting features. Both trees are noted as having a **low** likelihood of supporting roosting bats.

The Site has a **low** likelihood of supporting roosting bats and a **moderate** likelihood of supporting foraging and commuting bats.

Badgers

A total of 32 records of badger were returned from the data search. A badger sett was located along the eastern boundary with two holes and fresh spoil piles. Three older holes were noted along the northern boundary although these appeared to be inactive. The Site contains both suitable foraging and sett building habitat and is well connected to other areas of foraging such as the orchard to the east and the small patch of grassland to the west of the Site. As such badger are **confirmed** on the Site.

Brown hare

Two records of brown hare were returned by the data search from 1995 and 2010. The Site contains a mosaic of suitable habitat for brown hare including arable fields, hedgerow and areas of rocky bare ground. The adjacent grassland within the orchard and to the west of the Site are also suitable for brown hare. Therefore, there is a **moderate** risk of brown hare being present onsite.

Hedgehog

Two records of hedgehog were returned by the data search. The Site contains suitable hedgerow habitat and multiple log piles which could be used for hibernation. The Site is also well connected to the residential area to the north of the Site which is likely to be used by hedgehog. The Site has a **low** likelihood for supporting hedgehog.

5. ECOLOGICAL CONSTRAINTS, OPPORTUNITIES AND RECOMMENDATIONS

This section outlines key ecological issues for consideration, recommendations for further work and ecological enhancements where appropriate.

Off-site habitats

Fowlmere Watercress Beds SSSI is located 1.8km north-east of the Site, which is designated for its relic fen habitats. Consequently, Land at Water Lane, Melbourn falls within the Natural England Impact Risk Zones for this designated site. No direct impacts are anticipated from the development on the conservation features of the SSSI as the development is located some distance from the Site, however, it is important to consider potential indirect impacts that the development may have. These include artificial lighting, air quality and recreational pressures caused by the development itself and the additional persons introduced into the area by the development.

Due to its distance from the Site it is unlikely that the botanical features of Fowlmere Watercress Beds SSSI will be impacted by artificial lighting or air quality. The most significant impact will relate to increased recreational pressures arising from residents moving into the area. All new housing developments will require LPA consultation with Natural England.

It is advised that areas of greenspace are included within the development itself to allow for recreational pressures to be absorbed within the development.

Recommendation 1

Measures should be put in place to ensure that there are no indirect impacts on Fowlmere Watercress Beds SSSI likely relating to increased recreational pressure.

On-site habitats

Hedgerow are classified as a Habitat of Principal Importance under Section 41 of the NERC Act (2006). Hedgerows were present throughout the boundary of the Site. Hedgerows 1 and 2 are considered as species rich and are therefore of high conservation value. All hedgerows present onsite should be retained, protected and enhanced within the new development.

Arable field margins area also a Habitat of Principal Importance and can contain rare arable plants and support a range of notable wildlife. The field margins within the Site were noted to contain largely grassland with common species such as barren brome. These have the potential to support rare arable plant species but it is understood that within the context of the Site these areas may be difficult to retain. To compensate for the likely loss in botanical diversity, areas of species rich grassland should be provided and incorporated into the design scheme.

Recommendation 2

The hedgerows should be retained, protected and enhanced within the new development. Areas of species rich grassland should be incorporated into the design scheme to compensate for the loss of arable field margins.

Plants

Suitable habitats are present within the Site to support rare or notable plant species particularly within the main arable field and the field margins. Additionally, records of rare arable plants are present within the data search and several notable species were recorded during the survey. It Is recommended that a full botanical survey is completed to identify and record any protected or notable species present within the Site (The optimal season for this is between May and June with suboptimal surveys completed between April and September).

Recommendation 3

Complete a full botanical survey of the Site.

Reptiles

Suitable habitat for common species of reptile is present within the Site, in particular around the grassy field margins. The adjacent orchard and grassland to the west of the Site are also suitable for reptiles and as no barriers are present would allow for movement between these areas and the Site. Suitable habitat for breeding and hibernation are also present within the hedgerows and log-piles located around the boundary of the Site.

All UK reptile species are protected under Schedule 5 of the Wildlife & Countryside Act (1981), and are listed as Species of Principal Importance under the NERC Act (2006). It is an offence to intentionally kill or injure individuals of these species (see Appendix 1 for more information).

It is recommended that survey work is completed in order to determine the presence or absence of reptiles on Site and establish the potential impacts of these species. These surveys involve placing artificial refugia throughout the Site (which reptiles use to bask and hide) in the active season (March to October). The optimum survey times are April, May and September. Following best practice seven visits should be conducted during suitable weather as published by Froglife (1999).

Recommendation 4

Further reptile surveys should be undertaken between April and September to establish the presence or absence of reptiles.

Birds

There is the potential for important assemblages of farmland birds to occur within the Site including priority species which may be impacted by the proposed development. In order to better understand the Sites usage by notable species such as yellowhammer, grey partridge and corn bunting it is recommended that a suite of further bird surveys is undertaken. A reduced effort breeding bird survey (with three visits completed between March and July) should be undertaken to understand the extent of the use of the Site by notable bird species, particularly the farmland bird community. These surveys should be completed in accordance with the British Trust for Ornithology's Common Bird Census (CBC) (Bibby et al. 2000). If notable species are recorded it may be necessary to increase the survey effort.

Recommendation 5

Undertake further surveys to gain a better understanding of usage of the Site by notable bird species. This should consist of a reduced effort breeding bird survey (three visits between March and July

The hedgerows and grassland habitats onsite have the potential to provide suitable nesting habitat for birds. All wild birds, their active nests and eggs are protected under The Wildlife and Countryside Act 1981 (as amended), which makes it an offence deliberately, or recklessly, to kill or injure any wild bird or damage or destroy any active birds' nest or eggs.

Scheduling vegetation removal works between the months of September and February inclusive (i.e. outside of the bird season) would avoid impacts on breeding birds.

Where vegetation clearance works are required during the breeding bird season (between the months of March and August inclusive), such works can only proceed following the completion of a nesting bird check undertaken by an experienced ornithologist. Any active birds' nest identified during this check must be protected from harm until the nesting attempt is complete. This will require a buffer to be left around the nest, the size of which will depend upon the species involved (as a general rule, this will be 10m in all directions around the nest). Any buffers established as a result of the initial nesting bird check must be subjected to a second check after the original nesting attempt is completed, before such areas can be removed during the breeding bird season.

Recommendation 6

Schedule vegetation clearance works between the months of September and February inclusive to avoid impacts on breeding birds. Where this timing is not feasible works should be preceded by a nesting bird check.

It is strongly recommended that any potential nesting bird habitat is cleared outside the breeding bird season in order to avoid potentially lengthy delays if nests are found during nesting bird checks.

Provisions for both nesting and wintering birds will be designed after the survey effort to enable species specific measures to be implemented.

Bats

The Site contains suitable roosting, commuting and foraging habitat for bats. The clearance of vegetation, particularly any hedgerow habitat and construction activities such as increase in artificial lighting are likely to impact on foraging, commuting and roosting bats.

All bat species are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of Conservation of Habitats and Species Regulations (2017) (see Appendix 1). Bats are also Species of Principal Importance listed on Section 41 of the NERC Act (2006). It is an offence to deliberately disturb a bat, damage or destroy a bat roost, intentionally or recklessly disturb a bat at a roost, or obstruct access to a roost.

If all foraging and commuting habitats (mature trees, hedgerow and field margin) are retained within the new development and any artificial lighting is installed away from these features then no impacts are predicted on commuting or foraging bats and no further survey work will be required. By providing a greater areas of more diverse and better quality habitat within the new scheme design then no loss of foraging habitat is predicted.

Two mature trees were highlighted as having roosting potential. It is recommended that these are retained and protected from impacts during and post construction. If works are proposed to these trees such as removal or modification (e.g. limb removal/ pruning), further survey work will be required to establish if they are used by roosting bats.

Recommendation 7

Retain foraging and commuting habitat such as mature trees, hedgerow and field margins. Retain and protect the two trees highlighted as having potential roosting features.

Bat roosting behaviour, commuting and foraging activity can additionally be dramatically affected by artificial lighting (BCT, 2018). It is strongly recommended that any proposed exterior lighting on the new buildings is designed and managed appropriately to ensure that the area remains suitable for foraging bats. A sensitive lighting scheme should be developed to allow suitable roosting and foraging areas for bats. These should avoid the boundaries of the Site , in particular the hedgerows.

Recommendation 8

Light pollution from any lighting should be minimised both during and after the construction phase. A sensitive lighting scheme should be developed to allow for suitable roosting and foraging areas for bats

within the site with maximum use of appropriate luminaries and directed lighting. The hedgerows should not be lit.

Badgers

Two disused badger setts were recorded along the northern boundary and one active sett along the eastern boundary. Suitable sett building and foraging habitat is present throughout the Site. Impacts on badger are possible through disturbance from construction activities and any vegetation clearance. Badger setts and badgers occupying a sett are protected under the Protection of Badgers Act 1992.

Two possible options are available to address the badger constraint;

1. The first option would involve creating a 30m buffer zone around the sett within which no development works would take place. This would avoid impacts on the sett and thus avoid the need to apply for a licence from Natural England.

2. The second option is to apply for a licence from Natural England to close the sett. The licensing procedure provides measures to ensure that no offence is committed under the Protection of Badgers Act (1992). Broad guidelines, provided historically by English Nature (2002) on what activities would likely constitute 'disturbance' to a sett, and therefore which activities would require a licence to proceed, are as follows:
    - Works involving the use of heavy machinery within 30m of an entrance to an active sett;
    - Works involving the use of lighter machinery (particularly digging) within 20m of an entrance to an active sett; and
    - Any light work (e.g. hand digging or scrub clearance) within 10m of an entrance to an active sett.

Where a Natural England development licence is deemed necessary, this will involve one-way gates to be fitted to all affected badger sett entrance holes a minimum of 21 days before the commencement of ground works on site. The one-way gates must be left in position until all ground works scheduled within 30m of the active badger sett have been completed. It should be noted that setts can only be closed between 1 July and 30 November.

An ecologist should be consulted throughout the development of the master plan to advise on licensing requirements based on these guidelines, and ensure that suitable provisions are made on site for badgers' post-development. Prior to works starting on site, a pre-commencement badger survey should also be undertaken to ensure the no new setts have been established on site or within 30m of the site boundary.

Recommendation 9

Liaise with a suitably qualified ecologist throughout the production of a master plan for the site in order to establish the need to apply for a badger licence in connection with the development, and to ensure that adequate provisions are made for badger on site post-development. Undertake a pre-commencement check for new badger setts.

Brown hare

Suitable habitat for brown hare was identified within the arable fields. Brown hare are Species of Principal Importance (NERC Act 2006). It is likely that impacts on brown hare will result from habitat loss although due to the small size of the Site and surrounding similar habitat that this will be a minimal impact.

Ground clearance for the development should avoid the breeding period for brown hare which runs from February to August. If this is not possible then a pre-development check should be completed for forms containing leverets prior to work commencing.

Recommendation 10

Ground clearance should avoid brown hare breeding season or a pre-development check for forms/ leverets should be undertaken.

Hedgehog

The Site contains suitable hedgerow habitat and multiple log piles which could be used for hibernation. The Site is also well connected to the residential area to the north of the Site which is likely to be used by hedgehog.

The installation of boundary fences between gardens can impact on hedgehogs through loss of habitat connectivity. The installation of at least one 13cm x 13cm hole at the bottom of each boundary fence (with a focus on fences separating residential gardens, and excluding fences adjacent to roads), in order to maintain connectivity for hedgehogs between properties. These 'hedgehog highways' (PTES, 2018) should have appropriate signage installed to indicate their purpose and stipulate that they should remain open.

Recommendation 11

Maintain habitat connectivity for hedgehog through the installation of at least one 13cm x 13cm hole at the bottom of each boundary fence (with a focus on fences separating residential gardens, and excluding fences adjacent to roads). These should be accompanied with appropriate signage indicating their purpose and stipulating that they should remain open.

Opportunities for biodiversity enhancement

Following the issue of the National Planning Policy Framework (NPPF; see Appendix 1), all planning decisions should aim to maintain and enhance, restore or add to biodiversity and geological conservation interests. Ecological enhancements should aim to deliver biodiversity gains for the proposed development site.

Planting of native species or those with a known attraction or benefit to local wildlife is recommended in landscape proposals. This will help to increase native plant species diversity, provide more ecologically valuable habitats, and result in a greater diversity of other dependent taxonomic groups.

These recommendations should focus on improving the hedgerow onsite and including areas of diverse grassland and bee lawn. Hedgerow 3 is largely defunct and could be improved through native planting. Incorporating similar species to those which are already present such as hawthorn, field maple, elder and plum into the hedgerow will allow for a better-quality species rich hedgerow to be created. The inclusion of native tree planting should be incorporated into the site design and additional native trees planted throughout the new development.

Recommendation 12

It is recommended that native British species are incorporated within the planting scheme for the final landscaping design in order to enhance the overall value of the site for biodiversity, in line with the requirements of the NPPF.

Creating areas of open greenspace are also a key area of enhancement that will also aid in reducing recreational pressure on Fowlmere SSSI. Creating an area of orchard within the development will aid in increasing connectivity to neighbouring habitat while also providing areas of greenspace. Tree planting should include native species of fruit producing trees of local provenance. This could include apple *Malus domestica*, pear *Pyrus* sp, plum and walnut *Jugans regia*.

Recommendation 13

It is recommended that native British species are incorporated within the planting scheme for the final landscaping design in order to enhance the overall value of the site for biodiversity, in line with the requirements of the NPPF.

Areas of proposed amenity grassland habitat throughout the Site including within residential gardens create an opportunity to create areas of bee lawn that can act as an important resource for bumblebees and other insect pollinators, which in turn provides benefits for other species within the ecosystem, including reptiles and bats. A bee lawn can be created by over-seeding the lawn with suitable plants such as selfheal *Prunella vulgaris* or bird's-foot-trefoil *Lotus corniculatus* and by reducing the mowing height and frequency. For more detailed information about the creation of a bee lawn please refer to Appendix 4.

Additionally, the creation of deadwood features at the site will be particularly valuable for invertebrates as a foraging resource, which in turn benefits a range of other species such as hedgehogs and reptiles. This could include rotting roots or tree stumps spread around various locations. The drilling of holes or cutting of notches can add even more value for invertebrates.

Recommendation 14

Incorporate simple biodiversity enhancement measures at the site, including the creation of a bee lawn and provision of deadwood features.

As well as the inclusion of an orchard the provision of a greater diversity of habitats within the new development will enhance the Site for a range of species. Wildflower planting, tree planting and the addition of species rich grassland will all aid in increasing the range of habitats within the new site. The addition of a wildlife pond would enhance the site's overall biodiversity and provide further suitable foraging habitat for wildlife.

Recommendation 15

Incorporate a diversity of habitats within the development including areas of wildflower planting and a wildlife pond.

It is recommended a Landscape and Ecological Management Plan (LEMP) is produced for the Site in order to detail the number and location of bird and bat boxes and give further details on the creation and management of the ecological enhancements recommended in this report. This should be produced during the design phase in order to incorporate and create space for ecological features in the design.

Recommendation 16

Produce a LEMP for the Site to detail the number and location of bird and bat boxes and the creation and management of the ecological enhancements recommended in this report.

Summary of recommendations

Table 6 below summarises the recommendations made within this report, and specifies the stage of the development at which action is required. Colour coding of cells within the table is as follows:

Key:

No action required for this species group at this stage

Action required (see notes for details)

Level of action required will be determined following the further survey work

Table 6: Summary of recommendations at Land at Water Lane, Melbourn

Species	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Designated area	Incorporate areas of accessible natural green space into the development.	Implement the results of LPA consultation with Natural England	TBC	TBC
Habitats	Retain Habitats of Principal Importance and native planting	No	Protection of habitats during construction	Orchard planting, native planting of species rich grassland, bee lawn and hedgerows.
Plants	Further survey work: botanical survey	TBC	TBC	TBC

Species	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Reptiles	Further survey work to ascertain presence/absence	TBC	TBC	TBC
Birds	Further survey work, bird boxes and native planting	TBC	Timing of works for vegetation removal OR further survey work Incorporate integrated bird boxes into new buildings	Bird boxes and native planting
Bats	Further survey work if impacts to potential roosting, commuting and foraging habitats. Bat boxes and native planting	TBC	Incorporate integrated bat boxes into new buildings	Bat boxes and native planting
Brown hare	Retain habitat where feasible	Avoid breeding season OR pre-commencement check if breeding season can't be avoided.	No	No
Badgers	No	Establish a 30m buffer zone around the badger sett or apply for a Natural England licence.	TBC	TBC
Hedgehog	No	No	Hedgehog highways.	Hedgehog highways.

Table 7: Summary of further surveys recommended at Land at Water Lane

Species/species group	Purpose of survey	Survey period (inclusive unless otherwise stated)
Plants	Identify whether any rare plants in adjacent designated areas are also found onsite.	May-July
Reptiles	Confirm presence/absence	Apr, May, Sep
Breeding birds	Confirm usage of arable habitat by these species	Mar-Jul
Badger	Check if new setts have been created	All year

6. CONCLUSIONS

A Preliminary Ecological Appraisal of Land at Water Lane, Melbourn was undertaken in August 2021. The appraisal assessed the ecological value of habitats on site and their potential to support protected species. The Site was found to contain largely arable field with two Habitats of Principle Importance (hedgerow and arable field margin).

The Site was found to contain suitable habitat for several protected species groups including plants, birds, bats, reptiles, amphibians, badger and brown hare. It is thought that by protecting and enhancing areas used by roosting, foraging and commuting bats that no further work will be required for this species.

Further survey work has been recommended for birds to assess how breeding populations of farmland species utilise the site. Action should be taken to address the badger sett, though implementing a buffer zone or a sett closure via a Natural England licence. A pre-commencement check for new setts prior to works is recommended. Reptile surveys have also been recommended to ascertain the presence or absence of common reptile species within the Site.

There are several opportunities to increase the biodiversity of the Site post-development. This included creating areas of species rich grassland and using proposed areas of amenity grassland to create bee lawn. Hedgerow 3 can also be enhanced through the planting of additional native species to reduce the defunctness of the hedgerow. As hedgerows are habitats of principal importance hedgerows 1 and 2 should be retained and protected during development. The inclusion of an area of orchard will also aid in creating areas of greenspace to prevent recreational pressure on Fowlmere Watercress Beds SSSI as well as further enhancing the connectivity of the Site to similar habitat in the surrounding area.

The provision of bird and bat boxes and a sensitive lighting scheme should also be incorporated into the new development. This will be detailed within an LEMP which will contain the number and location of ecological enhancements recommended in this report and outline methods of best practice.

7. REFERENCES

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8. APPENDICES

Appendix 1: Relevant wildlife legislation and planning policy

Please note that the following is not an exhaustive list, and is solely intended to cover the most relevant legislation pertaining to species commonly associated with development sites.

Subject	Legislation (England)	Relevant prohibited actions
Amphibians		
Great crested newt *Triturus cristatus* Natterjack toad *Epidalea calamita*	Schedule 2 of Conservation of Habitats and Species Regulations (2017) Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Deliberately capture or kill, or intentionally injure; • Deliberately disturb or recklessly disturb them in a place used for shelter or protection; • Damage or destroy a breeding site or resting place; • Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection; and • Possess an individual, or any part of it, unless acquired lawfully.
Reptiles		
Common lizard *Zootoca vivipara* Adder *Vipera berus* Slow-worm *Anguis fragilis* Grass snake *Natrix helvetica helvetica*	Part of Sub-section 9(1) of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill or injure individuals of these species (Section 9(1)).

Subject	Legislation (England)	Relevant prohibited actions
Sand lizard *Lacerta agilis* Smooth snake *Coronella austriaca*	Full protection under Section 9 of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Deliberately or intentionally kill, capture (take) or intentionally injure; • Deliberately disturb; • Deliberately take or destroy eggs; • Damage or destroy a breeding site or resting place or intentionally damage a place used for shelter; or • Intentionally obstruct access to a place used for shelter.
Birds		
All wild birds	Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure, or take any wild bird or their eggs or nests.
'Schedule 1' birds	Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)	• Disturb any wild bird listed on Schedule 1 whilst it is building a nest or is in, on, or near a nest containing eggs or young; or • Disturb the dependent young of any wild bird listed on Schedule 1.
Mammals		
Bats (all UK species)	Schedule 2 of Conservation of Habitats and Species Regulations (2017)	• Deliberately capture, injure or kill a bat; • Deliberately disturb a bat (disturbance is defined as an action which is likely to: (i) Impair their ability to survive, to breed or reproduce, or to rear or nurture their young; (ii) Impair their ability to hibernate or migrate; or (iii) Affect significantly the local

Subject	Legislation (England)	Relevant prohibited actions
	Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	distribution or abundance of the species); • Damage or destroy a bat roost; • Intentionally or recklessly disturb a bat at a roost; or • Intentionally or recklessly obstruct access to a roost. In this interpretation, a bat roost is "*any structure or place which any wild [bat]...uses for shelter or protection*". Legal opinion is that the roost is protected whether or not the bats are present at the time.
Badger *Meles meles*	Protection of Badgers Act 1992	Under Section 3 of the Act: • Damage a sett or any part of it; • Destroy a sett; • Obstruct access to, or any entrance of, a sett; or • Disturb a badger when it is occupying a sett. A sett is defined legally as any structure or place which displays signs indicating current use by a badger (Natural England 2007).
Hazel dormouse *Corylus avellana*	Schedule 2 of Conservation of Habitats and Species Regulations (2017)	• Intentionally or deliberately capture or kill, or intentionally injure;

Subject	Legislation (England)	Relevant prohibited actions
	Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Deliberately disturb or intentionally or recklessly disturb them in a place used for shelter or protection; • Damage or destroy a breeding site or resting place; • Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection; and • Possess an individual, or any part of it, unless acquired lawfully.
Otter *Lutra lutra*	Schedule 2 of Conservation of Habitats and Species Regulations (2017) Section 9(4)(b) and (c) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Deliberately capture, injure or kill an otter; • Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young; • Intentionally or recklessly disturb any otter whilst it is occupying a holt; • Damage or destroy or intentionally or recklessly obstruct access to an otter holt.
Water vole *Arvicola amphibius*	Section 9 of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure or take water voles; • Possess or control live or dead water voles or derivatives; • Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection; or • Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.

Subject	Legislation (England)	Relevant prohibited actions
Crustaceans		
White-clawed crayfish *Austropotamobius pallipes*	Section 9(1) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure or take white-clawed crayfish by any method.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2017

Full legislation text available at: The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2017 (legislation.gov.uk)

The Wildlife and Countryside Act 1981 (as amended)

Full legislation text available at: http://www.legislation.gov.uk/ukpga/1981/69/contents.

Countryside and Rights of Way Act 2000

Full legislation text available at: http://www.legislation.gov.uk/ukpga/2000/37/contents

Protection of Badgers Act 1992

Full legislation text available at: http://www.legislation.gov.uk/ukpga/1992/51/contents

Section 41 of Natural Environments and Rural Communities (NERC) Act 2006

Full legislation text available at: http://www.legislation.gov.uk/ukpga/2006/16/section/41

Many of the species above, along with a host of others not afforded additional protection, are listed on Section 41 of the NERC Act 2006.

Section 41 (S41) of the Natural Environment and Rural Communities (NERC Act 2006) requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The list (including 56 habitats and 943 species) has been drawn up in consultation with Natural England and draws upon the UK Biodiversity Action Plan (BAP) List of Priority Species and Habitats.

The S41 list should be used to guide decision-makers such as local and regional authorities to have regard to the conservation of biodiversity in the exercise of their normal functions – as required under Section 40 of the NERC Act 2006. The duty applies to all local authorities and extends beyond just conserving what is already there, to carrying out, supporting and requiring actions that may also restore or enhance biodiversity.

Schedule 9 of Wildlife and Countryside Act 1981 (as amended)

In addition to affording protection to some species, The Wildlife and Countryside Act 1981 (as amended) also names species which are considered invasive and require control. Section 14 of the Act prohibits the introduction into the wild of any animal of a kind which is not ordinarily resident in, and is not a regular visitor to, Great Britain in a wild state, or any species of animal or plant listed in Schedule 9 to the Act. In the main, Schedule 9 lists non-native species that are already established in the wild, but which continue to pose a conservation threat to native biodiversity and habitats, such that further releases should be regulated.

Wild Mammals (Protection) Act 1996

Full legislation text is available at: http://www.legislation.gov.uk/ukpga/1996/3/contents

Under this legislation it is an offence to cause unnecessary suffering to wild mammals, including by crushing and asphyxiation. It largely deals with issues of animal welfare, and covers all non-domestic mammals including commonly encountered mammals on development sites such as rabbits, foxes and field voles.

Birds of Conservation Concern (BoCC)

This is a quantitative assessment of the status of populations of bird species which regularly occur in the UK, undertaken by the UK's leading bird conservation organisations. It assesses a total of 246 species against a set of objective criteria to place each on one of three lists – Green, Amber and Red – indicating an increasing level of conservation concern. There are currently 52 species on the Red list, 126 on the Amber list and 68 on the Green list. The classifications described have no statutory implications, and are used merely as a tool for assessing scarcity and conservation value of a given species.

National Planning Policy Framework (NPPF)

Full text is available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

The revised NPPF was updated on 20 July 2021 setting out the Government's planning policies for England and the process by which these should be applied. The policies within the NPPF are a material consideration in the planning process. The key principle of the NPPF is a presumption in favour of sustainable development, with sustainable development defined as a balance between economic, social and environmental needs.

Policies 174 to 188 of the NPPF address conserving and enhancing the natural environment, stating that the planning system should:

- Contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes;
- Recognise the wider benefits of ecosystem services; and
- Minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

Furthermore there is a focus on re-use of existing brownfield sites or sites of low environmental value as a priority, and discouraging development in National Parks, Sites of Specific Scientific Interest, the Broads or Areas of Outstanding Natural Beauty other than in exceptional circumstances.

Where possible, planning policies should also

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

Appendix 2: UK Habitat Classification species list

Please note that these lists are intended to be incidental records and do not constitute a full botanical survey of the site. Relative abundance is given using the DAFOR scale. Please see Table 2 for details.

Arable field margins (c1a)

Common Name	Systematic Name	Relative abundance
Barron brome	*Bromus sterilis*	D
Cock's-foot	*Dactylis glomerata*	F
Cow parsley	*Anthriscus sylvestris*	F
Common nettle	*Urtica dioica*	F
Clematis	*Clematis vitalba*	F
Funitory sp.	*Fumaria sp.*	F
Sharp-leaved fluellen	*Kickxia elatine*	F
Spear thistle	*Cirisium vulgare*	O
White bryony	*Bryonia dioica*	O
Greater burdock	*Arctium lappa*	O
Common couch	*Elymus repens*	O
Scentless mayweed	*Tripleurospermum inodorum*	O
Nipplewort	*Lapsana communis*	O
Mugwort	*Artemisia vulgaris*	O
Greater knapweed	*Centaurea scabiosa*	O
Field scabious	*Knautia arvensis*	O
Round-leaved fluellen	*Kickxia spuria*	O
Small toadflax	*Chaenorhinum minus*	O
White campion	*Silene latifolia*	R
Red campion	*Silene dioica*	R
Black horehound	*Ballota nigra*	R
Broad-leaved plantain	*Plantago major*	R
Common mallow	*Malva sylvestris*	R
Bittersweet	*Solanum dulcamara*	R

Common Name	Systematic Name	Relative abundance
Common poppy	*Papaver rhoeas*	R
Stinking iris	*Iris foetidissima*	R
Asparagus	*Asparagus officinalis*	R
Prickly lettuce	*Lactuca serriola*	R

Arable and horticulture (c1)

Common Name	Systematic Name	Relative abundance
Wheat	*Triticum* sp.	A
Barley	*Hordeum vulgare*	A
Oat	*Avena sativa*	A
Millet	*Panicum miliaceum*	A

Hedgerow (h2a) (priority habitat)

Common Name	Systematic Name	Relative abundance
Field maple	*Acer campestre*	D
Plum	*Prunus domestica* ssp	D
Bramble	*Rubus fruticosus agg.*	A
Hawthorn	*Crataegus monogyna*	A
Pedunculate Oak	*Quercus robur*	F

Appendix 3: Site photographs

Photograph 1: Arable field

Photograph 2: Inactive badger sett

Photograph 3: Hedgerow 1

Photograph 4: Arable field margin

Photograph 5: Deadwood on the eastern boundary

Photograph 6: Hedgerow 1

Photograph 7: Hedgerow 2

Photograph 8: Tall grassland to the east of the Site

Photograph 9: Active badger sett

Photograph 10: Hedgerow 3

Appendix 4: Bee Lawn

Garden spaces are important habitats and resources for many pollinators including bees, butterflies, hoverflies and beetles, which in turn provide resources for other species such as reptiles and bats. A bee lawn would be specifically cultivated to attract insect pollinators to your garden.

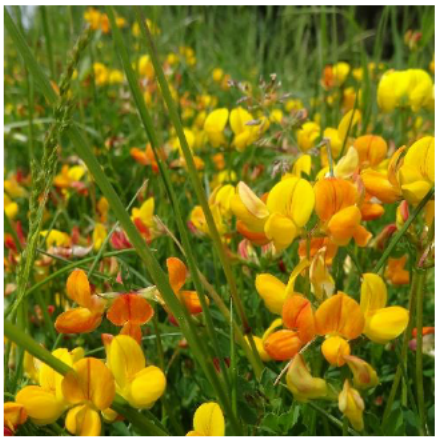
A bee lawn can be created by planting a seed mix containing flowering plants that are low-growing, attractive to pollinators and are also resistant to relatively frequent mowing. This would create a shorter, neater alternative to a wildflower meadow, but still contain a wide variety of pollinator friendly plants. The flowers to be planted should be a variety of shapes, colours and sizes to increase the diversity of pollinators which will be attracted including, but not limited to, bumblebees, solitary bees, flies and butterflies.

Mowing this area approximately once every three weeks and raising the mower blades to their highest level (around 3 inches is optimal) will allow these flowering plants to grow and thrive for the entire summer period.

Pre-made seed mixes for bee lawns are already available from a limited number of online sellers. Most wildflower mixes sold online are made up of taller meadow species that would not be suitable for a short garden lawn. One available lawn seed mix is the 'Wild Flower lawn seed mix' provided by Wild Flower Lawns and Meadows (https://www.wildflowerlawnsandmeadows.com/). This includes many suitable flowering plants but also includes species such as common spotted orchid (*Dactylorhiza fuchsia*) which does not respond well to frequent mowing and can take 3-4 years to germinate and flower. Another provider selling a wildflower mix designed for lawns is John Chambers Wildflower Seed (https://www.johnchamberswildflowers.co.uk/). This mix contains many optimal flower species, and is sold both as a 100% wildflower mix and a mix including grass seeds (80% grass, 20% wildflower). However, if you were to buy the mix that includes grasses, the species of grasses contained in the mix are not specified, and with 80% of the seed being grass, there is a risk of the wildflowers being lost within the lawn.

Finally, if you have a pre-existing list of flowering plants that you would want in a bee lawn, there are websites which allow you to create your own bespoke seed mix to suit the particular area you are planting, one such website is https://www.phoenixamenity.co.uk/.

Links to specific web pages for all three suppliers cited above are provided at the end of this document. The following table outlines some of the key flowering plants you may like to include if you were putting together your own seed mix:

Species Name	Description	Picture
Birds-foot Trefoil (*Lotus corniculatus*)	Low, creeping perennial with bright yellow flowers tinged with orange, and is nitrogen fixing. Heavily used by bumblebees and solitary bees as a source of nectar and pollen; also used by some butterfly species. It is used by a variety of lepidoptera as a larval foot plant e.g. common blue butterfly (*Polyommatus icarus*) and Six-belted clearwing moth (*Bembecia ichneumoniformis*).	 © RHS/Helen Bostock
Clover spp. (*Trifolium spp.*)	Clover species are much favoured by many bumblebees (in particular the long-tongued species) and are also nitrogen fixers. White clover is the most common species but Red clover and Alsike clover can also be planted. This low-growing flower has an ability to survive even close mowing.	 ©Jouko Lehmuskallio
Wild Thyme (*Thymus polytrichus*)	Wild thyme often grows in dense patches, its small pink/purple flowers are attractive to many different types of pollinators such as butterflies and smaller bees.	

Creeping Buttercup (*Ranunculus repens*)	Forms a network of shoots and runners across the ground and spreads quickly. Buttercup flowers are a bright shiny yellow and as an open flower it is a source of nectar for a wide variety of pollinators. Flowering may not take place in the first year and flowering can be late with plants sometimes flowering in October.	
Common Knapweed (*Centaurea nigra*)	Very hardy thistle-like plant with bright purple flowers; very popular plant with pollinators (bees, butterflies, beetles, flies etc.) as it produces large volumes of nectar over the summer period.	
Cowslip (*Primula veris*)	Flowering in spring, cowslips are easily recognisable with their long tubular yellow flowers that grow in clusters on ~25cm tall stalks. Cowslips usually flower in April-March, before grasses tend to get long. These flowers would be more suited to later and less frequent mowing.	 ©Laurie Campbell
Eyebright (*Euphrasia sp.*)	Small plant producing very small (5-10mm) white flowers. Semi-parasitic, they take nutrients from the roots of nearby plants, so do well in a meadow setting. This flower is almost exclusively pollinated by bees, with the yellow spot on the petals used to guide them in.	 © Trevor Dines

Germander Speedwell (*Veronica chamaedrys*)	Another low growing, creeping species; Germander Speedwell tends to grow in patches or mats among grasses and the small blue/purple flowers are particularly attractive to smaller pollinators such as small flies and solitary bees.	
Chammomile (*Chamaemelum nobile*)	Small plant with daisy-like flowers, historically used for lawns and therefore very suited to a frequently mown area. This flower is chiefly pollinated by small flies, so a useful addition to a lawn to attract alternate insect pollinators to bees and butterflies.	
Selfheal (*Prunella vulgaris*)	A violet blue flower atop a hairy stem, with the rest of the plant forming a mat among the grasses. This plant is often found among turf and is therefore resistant to mowing. These flowers are particularly attractive to *Lycaenidae* butterflies, small moths and solitary bees.	

Other flowering plants to consider including would be:

- Kidney Vetch (*Anthyllis vulgaris*)
- Daisy (*Bellis perennis*)
- Oxeye Daisy (*Leucanthemum vulgare*)
- Ragged Robin (*Lychnis flos-cuculi*)
- Yarrow (*Achillea millefolium*)
- Ribwort Plantain (*Plantago lanceolata*)
- Salad Burnet (*Sanguisorba minor*)
- Wild Marjoram (*Origanum vulgare*)
- Toadflax (*Linaria vulgaris*)

- Yellow Rattle (*Rhinanthus minor*) – This plant is particularly useful if the lawn is being created on previously well fertilised, grass heavy soils, as it is very good at drawing away nutrients and suppressing grass growth. (Sourced seeds must be as fresh as possible for best chance of growth).

Links to wildflower lawn seed mixes:

- https://www.wildflowerlawnsandmeadows.com/shop/flowering-lawn-wild-flower-seed-mix/
- https://www.johnchamberswildflowers.co.uk/wildflower-seeds-mixes/80-grass-seed-mixes/heritage-flowering-lawn-80-grass-seed-wildflower-mix
- https://www.phoenixamenity.co.uk/store/products/create-your-own-wildflower-and-wildflower-and-grass-mix/
- ***"Note: All generic wild flower seed mixes have high grass content. Some of the above plants will only grow under certain soil characteristics, and further investigation of soil properties is strongly recommended for all sites before deciding upon the appropriate seed mix/ plant species. Should you wish to develop a more dramatic wild flower meadow, MKA Ecology would be happy to produce a bespoke mix for your site in order to create an outstanding meadow feature"***

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ECOLOGY

MKA Ecology Limited, New Cambridge House, Bassingbourn Road, Litlington, Cambridgeshire SG8 0SS
01763 262 211 | info@mkaecology.co.uk | www.mkaecology.co.uk
Company registration no 5858121 | VAT no. 825137440