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ECOLOGY

Preliminary Ecological Appraisal

Gooseacre, Markyate, Hertfordshire

Site	Gooseacre, Markyate, Hertfordshire
Project number	80818
Client name / Address	Kirkland Fraser Moor, Design Laboratory, Clarence Road Depot, Clarence Road, Berkhamsted, Hertfordshire, HP4 3AS

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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.

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.

CONTENTS

1.	EXECUTIVE SUMMARY	3
2.	INTRODUCTION	5
2.1.	Aims and scope of Preliminary Ecological Appraisal	5
2.2.	Site description and context	5
2.3.	Proposed development	5
2.4.	Legislation and planning policy	6
3.	METHODOLOGIES	10
3.1.	Desktop study	10
3.2.	Phase 1 habitat survey	10
3.3.	Protected species scoping survey	11
3.4.	Surveyor, author and reviewer	12
3.5.	Date, time and weather conditions	12
3.6.	Constraints	12
4.	RESULTS	14
4.1.	Desktop study	14
4.2.	Phase 1 habitat survey	16
4.3.	Protected species scoping survey	20
5.	ECOLOGICAL CONSTRAINTS, OPPORTUNITIES AND RECOMMENDATIONS	25
6.	CONCLUSIONS	32
7.	REFERENCES	33
8.	APPENDICES	34
8.1.	Appendix 1: Relevant wildlife legislation and planning policy	34
8.2.	Appendix 2: Phase 1 Habitat species list	41
8.3.	Appendix 3: Site photographs	44

1. EXECUTIVE SUMMARY

In November, 2018 MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal of Gooseacre, Markyate, Hertfordshire. The appraisal included a Phase 1 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 21/11/2018.

The development site currently comprises of an improved grassland surrounded by hedgerows. To the north and west, these hedgerows are mature and offer much ecological value. Gooseacre is set within arable farmland, interspersed with woodland, some of which is regarded as ancient. It is also located within the Chilterns AONB, with chalk grasslands being a defining feature.

The proposed development is for the construction of a single residential property. The development will need to satisfy paragraph 79 of the NPPF. Green roofs, bird and bat boxes are proposed as enhancements within the building, and the creation of an orchard and meadow enhancement are proposed for the wider site.

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

- **West boundary hedgerow:** A Habitat of Principal Importance. This mature feature offers ecological benefits to most taxonomic groups. Installation of fencing to protect the feature during construction.
- **Reptiles:** Grassland habitat and hedgerow offer suitable habitat but limited local records. Vegetation clearance to be conducted under a method statement.
- **Birds:** Suitable breeding bird habitat on site. Vegetation clearance works should be scheduled **between September and February** inclusive to avoid impacts on nesting birds.
- **Bats:** Suitable foraging and commuting habitat. A sensitive lighting scheme should be developed to consider the during- and after- construction phases of the development.
- **Badger:** Outlying sett found in the west boundary hedgerow. Protective measures described above for the hedgerow will limit impacts to badger.
- **Hazel dormouse.** Suitable habitat and records from woodland 1.3km west. Protective measures described above for the hedgerow will limit impacts to hazel dormouse.
- **Brown hare:** Suitable habitat in grassland. Ground clearance to be restricted to the period **outside February to August** or checks for leverets/forms to precede ground clearance.

A wide range of biodiversity enhancements are proposed and are endorsed. In order to ensure that the most effective strategy of meadow enhancement is employed, it is recommended that soil samples are collected to establish nutrient loading and pH at the Site. An effective meadow restoration, in addition to the other proposed enhancements, is likely to lead to the site significantly enhancing the immediate

surrounds. An ecological management plan is recommended to ensure that a net gain for biodiversity is achieved long into the future of the development. A biodiversity statement, which will objectively measure the overall biodiversity gains of the proposed development, will accompany this report separately.

2. INTRODUCTION

2.1. Aims and scope of Preliminary Ecological Appraisal

In November 2018 MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal at Gooseacre, Markyate by Kirkland Fraser Moor in order to support a planning application for the proposed construction of a single dwelling house on existing grassland.

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 Phase 1 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 site location and survey area are shown on the map in Figure 1. Within this report this area is referred to as the Site or Gooseacre, Markyate.

The Site is located 300m west of Markyate in Hertfordshire (grid reference TL 05343 16458) and falls under the jurisdiction of Hertfordshire County Council and Dacorum Borough Council. It measures approximately 0.9 hectares and is an apparently unused grassland adjacent to two properties to the east, the original dwelling also known as Gooseacre. An access track serving the grassland originates from the same access driveway as the two existing dwellings. A public footpath forms the southern boundary and there are additional footpaths and other rights of way around the field boundaries that adjoin the Site. Gooseacre lies within the Chilterns AONB (Figure 1).

2.3. Proposed development

The proposal is for a single dwelling house centrally positioned in the northern half of the field. Access to the dwelling would be from the existing access track running along the southern boundary. The design and landscaping are based around a principle of benefitting local biodiversity, with several areas being given over to either the creation of new habitats or the enhancement of existing ones. An orchard with meadow understorey is proposed in the south-west, as is extensive tree planting in a central avenue and east boundary. The new dwelling, a four-block arrangement centred around a courtyard

will incorporate green roofs, 'living walls' and enhancements for roosting bats, nesting birds and invertebrates (Figure 2, Figure 3). The proposed landscaping plan will enhance the existing grassland, retain the existing hedgerows to the west and south and replace the existing laurel hedge in the east with a native species rich hedgerow.

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, a revised National Planning Policy Framework (NPPF) issued on 24 July 2018 requires planning decisions to contribute to conserving and enhancing the local environment. Further details are provided in Appendix 1.

The Dacorum Borough Council has produced an adopted Local Plan which covers a number of policies relating to biodiversity and habitat conservation, including the support of national and local Biodiversity Action Plans (BAP), in this case the Hertfordshire BAP (Hertfordshire Biodiversity Partnership, 2006). Where relevant these are discussed in further detail in Section 5. Pre-planning advice has also made reference to the location of the development site as being isolated from existing settlement and therefore subject to the NPPF Paragraph 79 (formerly 55). In particular, this development comes under paragraph 79(e), whereby it (our emphasis underlined):

- *is truly outstanding or innovative, reflecting the highest standards in architecture, and would help to raise standards of design more generally in rural areas; and*
- *would significantly enhance its immediate setting, and be sensitive to the defining characteristics of the local area.*

Figure 1: Site location and context.

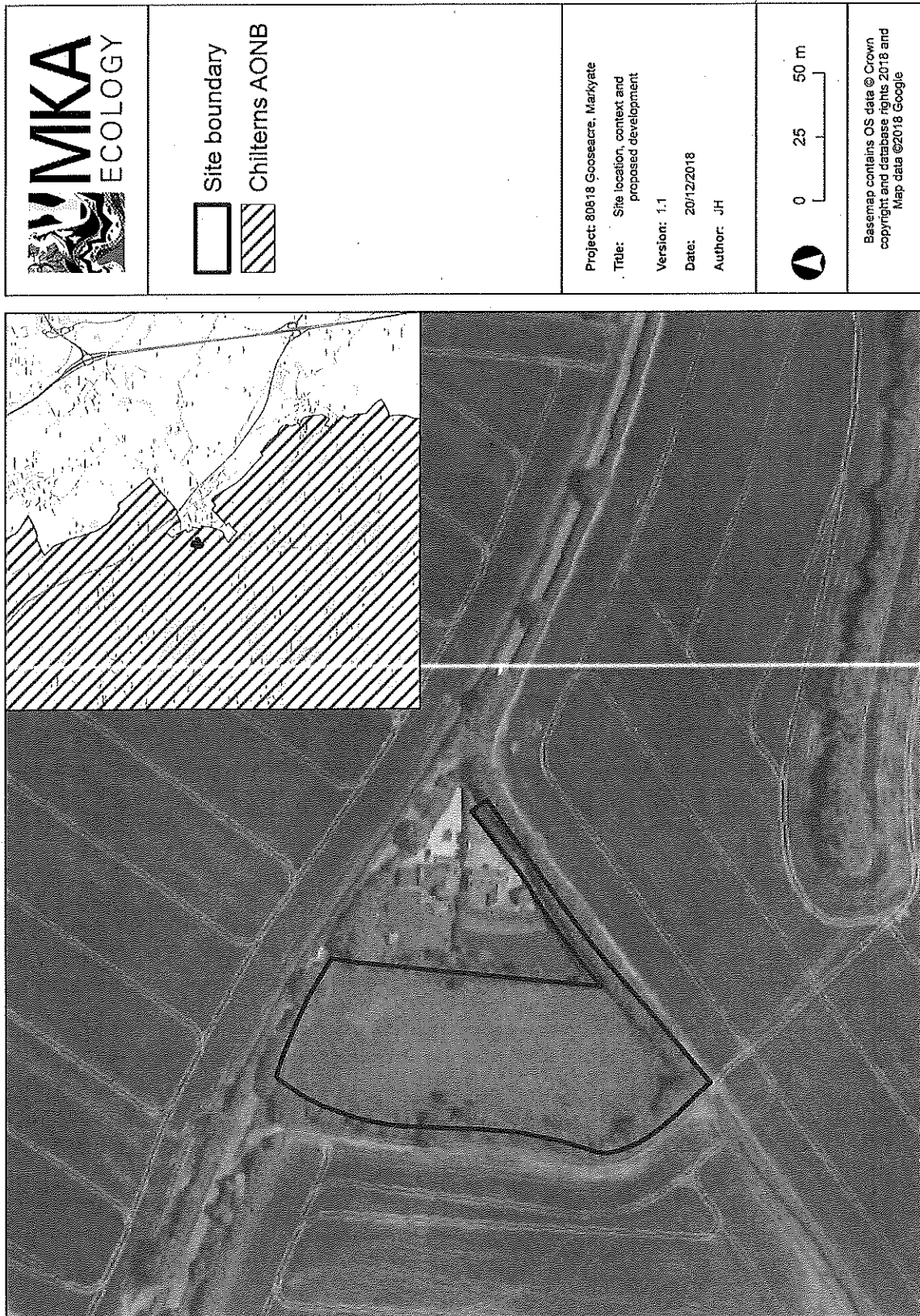
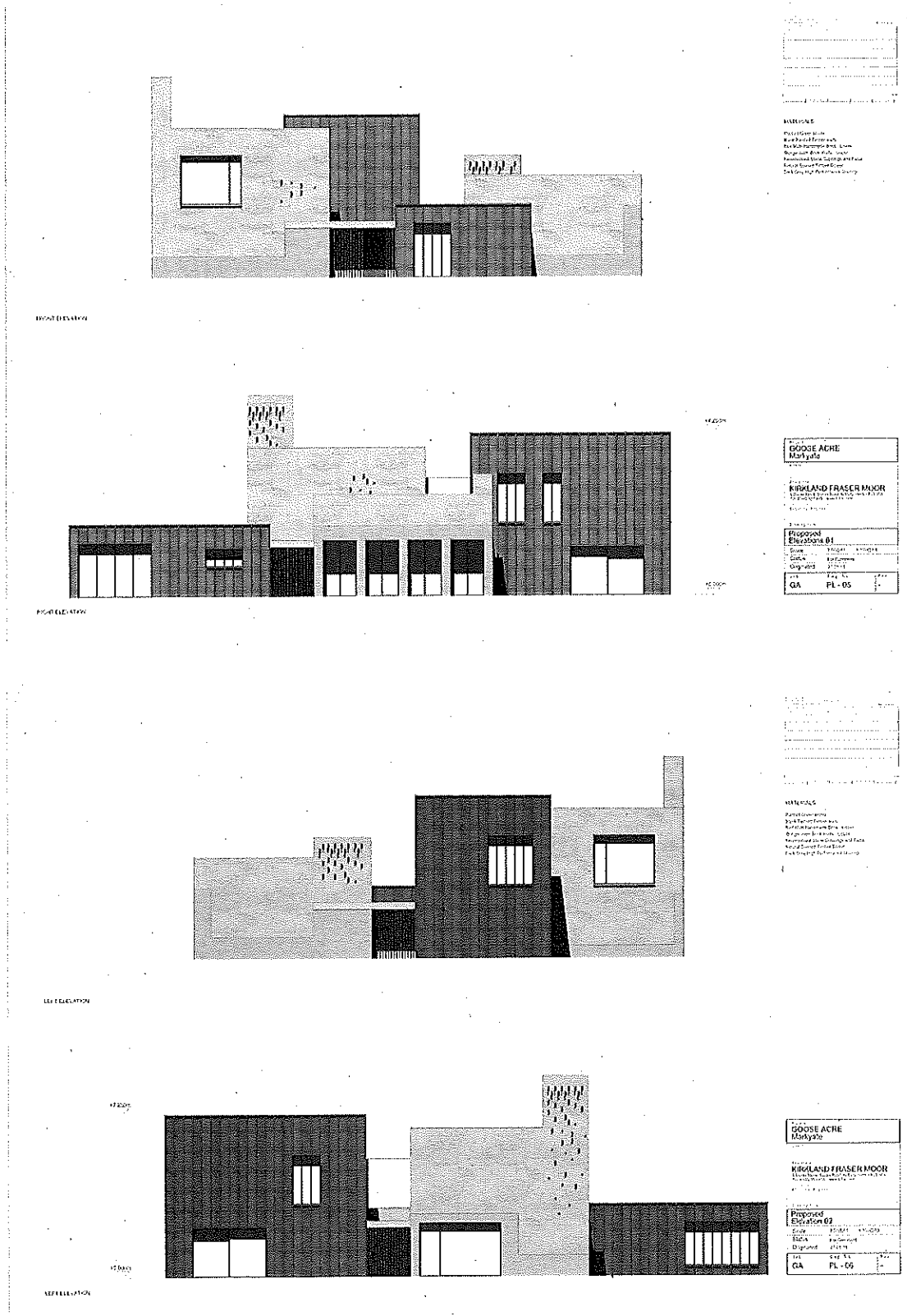


Figure 3: Proposed development – elevations (drawings by Kirkland Fraser Moor)



3. METHODOLOGIES

This Preliminary Ecological Appraisal has been undertaken in accordance with the Chartered Institute for 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 of the site centroid. The organisations listed in Table 1 were contacted with regard to biodiversity data.

Table 1: Organisations providing biodiversity data

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.	22/11/2018
Hertfordshire Environmental Records Centre (HERC)	Information on protected and notable sites and species within 2km of the Site (TL 05343 16458).	09/11/2018
Bedfordshire and Luton Biodiversity Recording and Monitoring Centre (BLBRMC)	Information on protected and notable sites and species within 2km of the Site (TL 05343 16458).	09/11/2018

The Dacorum Borough Council planning portal was also referred to in order to understand the scope of further development surrounding the Site.

3.2. Phase 1 habitat survey

Habitats were surveyed using the standardised Joint Nature Conservation Committee (JNCC) Phase 1 classification and mapping methodology (JNCC, 2010). Data were recorded onto field maps and then transferred onto a Geographic Information System (GIS) following the JNCC Colour Mapping Pallet for ArcGIS. Dominant plant species were observed and recorded within each habitat type. The plant species nomenclature follows that of Stace (2010).

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 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.

Protected species frequently encountered on development sites and considered within protected species scoping survey for Gooseacre, Markyate include the following:

- Amphibians: Great crested newt *Triturus cristatus*.
- Reptiles: Adder *Vipera berus*, common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica 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), European water vole *Arvicola amphibius*, otter *Lutra lutra* and hazel dormouse *Muscardinus avellanarius*.
- Invertebrates: White-clawed crayfish *Austropotamobius pallipes*.

In each case the likelihood of presence of these protected species at the Site was classified as being either 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.

In addition to the species listed above, the potential to support other rare or notable species (or habitats) is also considered. This includes Species and Habitats 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).

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, and report written, by James Heywood, Ecologist at MKA Ecology Limited. James has three years' experience of conducting Preliminary Ecological Appraisals. The report has been reviewed by Will O'Connor 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 recording 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*
21/11/2018	11:30	Wind: 2 SE; Cloud: 2; Temperature: 4.5°C; Rain: None

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

3.6. Constraints

A single visit cannot categorically ascertain the presence or absence of any 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 partly constrained by the voluntary nature of the contributions and what has been chosen to be submitted records. So, 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.

The assessment was undertaken outside the optimum period of April to the end of September. However, within the scope of the study it was possible to identify key habitats present and assess their likelihood of supporting a greater range of species.

4. RESULTS

4.1. Desktop study

An ecological desktop study was completed for the Site and the surrounding 2km. The data, provided by HERC and BLBRMC, identified numerous 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 0 below).

Details of statutorily designated sites identified as part of the desktop study are displayed in Table 4 below.

Table 4: Statutorily designated sites within 2km of Gooseacre, Markyate

Site name*	Area (ha)	Distance and direction	Reasons for selection
Dedmansey/Byslip Woods (AWI)	44.53	1.3km W	<ul style="list-style-type: none"> • Ancient semi-natural woodland • Lowland mixed deciduous woodland (UK BAP)
Lambs Spring (AWI)	72.47	1.3km SW	Ancient replanted woodland
Friendless Woods (AWI)	4.11	1.8km SE	Ancient semi-natural woodland
Brownleys (AWI)	6.81	1.9km ENE	Ancient semi-natural woodland
Unnamed (AWI)	1.08	1km SW	Ancient semi-natural woodland
Unnamed (AWI)	0.74	380m S	Ancient semi-natural woodland
Unnamed (AWI)	1.79	1.4km SE	Ancient replanted woodland
Unnamed (AWI)	1.97	1.3km SSE	Ancient replanted woodland

* AWI: Ancient Woodland Inventory

Details of non-statutorily designated sites identified as part of the desktop study are displayed in Table 5 below.

Table 5: Non-statutorily designated sites within 2km of Gooseacre, Markyate

Site name *	Area (ha)	Distance and direction	Reasons for selection
Great Bradwin's Wood (LWS 39/001)	69.82	1.3km SW	<ul style="list-style-type: none"> • Woodland indicators; • Replanted ancient woodland site with field evidence suggesting ancient origin; • Herb-rich rides; • Replanted ancient semi-natural woodland with scattered, remnant hornbeam <i>Carpinus betulus</i> and wild cherry <i>Prunus avium</i> in places.
Fairless Wood (LWS 39/003)	2.25	550m NW	<ul style="list-style-type: none"> • Woodland indicators; • Wildlife Site criteria: Ancient woodland with some semi-natural canopy and field evidence suggesting an ancient origin
Broomhill Leys Wood (LWS 40/001)	6.44	1.9km ENE	<ul style="list-style-type: none"> • Woodland indicators; • Ancient semi-natural mixed broadleaved woodland supporting mainly pedunculate oak <i>Quercus robur</i> with wild cherry standards plus coppice species woodland indicators.
Cheverell's Green (40/016)	3.30	620m SSE	<ul style="list-style-type: none"> • Grassland indicators; • Strips of roadside common land supporting neutral grassland, secondary woodland and scrub.

* Local Wildlife Site 'File code' provided (e.g., 40/016)

Gooseacre lies within the Chilterns AONB. The immediate surroundings comprise predominantly of arable fields, interspersed with areas of woodland, some of which are ancient (see Table 4 and Table 5). A network of hedgerows, many of which appear from aerial photographs to be incomplete or defunct. Four Veteran and Mature trees were also returned from the data search, three of which are from hedgerow settings (Table 6). Roadside hedgerows connect the Site to Dedmansey Woods AWI site to the west. Smaller AWI sites to the south are less obviously connected, though an incomplete hedgerow to the south-east forms the most direct corridor to these sites.

Table 6: Veteran and mature trees within 2km of Gooseacre, Markyate

Record No	Tree Species	Site Name	Context	Distance
1434	Oak species	Cheverells Green	Hedgerow	1.06km
1435	Oak species	Cheverells Green	Garden	710m
891	Oak species	Buckwood Lane	Hedgerow	920m
892	Oak species	Buckwood Lane	Hedgerow	560m

4.2. Phase 1 habitat survey

The Site was found to comprise predominantly of improved grassland, bound by hedgerows. These hedgerows varied in type, age and therefore quality. An access track, classified here as a poor semi-improved grassland on account of its apparent recent age and greater predominance of species such as creeping thistle *Cirsium arvense* and broad-leaved dock *Rumex obtusifolius*, joins the main part of the Site to Buckwood Road. The main grassland is apparently unmanaged and is therefore dominated by grasses. More detailed species lists, along with their relative abundance, can be found in Appendix 2. The Phase 1 habitat survey map is provided in Figure 4, at the end of this section. Descriptions of the habitat types present along with dominant species compositions are provided below.

Improved grassland

The majority of the approximately 0.9 hectare site is an improved grassland (Photograph 2, Photograph 3, Photograph 6). From communication with the landowner, the grassland was sown with a wildflower/meadow seed mix within the last three years and as such is classified as an improved grassland in keeping with the guidance set out in the Phase 1 habitat handbook (JNCC 2010). It appears largely unmanaged, with areas of locally dominant common nettle *Urtica dioica*, and broad-leaved dock *Rumex obtusifolium*, particularly in the south-west. The presence of cock's-foot *Dactylis glomerata* and meadow fescue *Schedorus pratensis* suggest a character tending towards a neutral grassland. Common knapweed *Centaurea nigra* was the most apparent herbaceous species. The grassland is apparently well used by a number of mammalian species, with tracks crossing in all directions, with several pathways and droppings along the west boundary hedgerow and scrub (Photograph 11). As highlighted in Section 3.6, establishing a full plant species list for grassland is constrained by the timing of the survey.

Poor semi-improved grassland

The former access track has been classified here as a poor semi-improved grassland (Photograph 1). Whilst small areas of the original gravel substrate are still visible, particularly towards the east gate, the area is almost entirely vegetated. Whilst some species are evidently seeded from the neighbouring meadow, the species composition, with broad-leaved willowherb *Epilobium montanum*, broad-leaved dock and lesser burdock *Arctium minus* are suggested of greater improvement and enrichment.

Scrub (dense and continuous)

Small areas of scrub form buffers between the hedgerow in the south and west, and grassland. The scattered scrub is dominated by blackthorn *Prunus spinosa* with suckers generated from the hedgerow. The dense scrub is dominated by bramble *Rubus fruticosus*, with bracken *Pteridium aquilinum* encroaching in the north-west and hazel *Corylus avellane* incursion from the adjoining hedgerow.

Bracken

Scattered stands of bracken in the west and north-west of the Site are found, extending the buffer between the hedgerow and grassland further north, replacing dense scrub as the boundary extends north.

Tall ruderal

A small patch of ruderal habitat is found in the south-west, dominated by common nettle. Other larger patches in the north-west and north-east are also found, these areas likely to indicate areas of local enrichment with fertiliser or possibly old cuttings.

Intact hedge – species-rich

A recently planted hedge comprising mostly of hornbeam, wild privet *Ligustrum vulgare* and hawthorn *Crataegus monogyna* forms the southern boundary. Individual plants are over three metres tall but the hedge is thin. It appears that the hedge has not been cut often, resulting in little sideways growth and low-density vegetation.

Hedgerow with trees – species-rich

A mature hedgerow forms the north and west boundaries (Photograph 2, Photograph 6), with the north portion tending towards being defunct with several large gaps. Hazel is the most abundant species, with hawthorn and blackthorn also present. The large individual standard trees of ash *Fraxinus excelsior* and pedunculate oak are included here as they would have formed part of the original boundary feature, but are marked as individual trees in Figure 4. The hedgerow is managed on the west side, with signs of being recently flail cut. The within-site aspect is unmanaged, with nearly all plants tending towards being considered trees and blackthorn in particularly forming a stand of scrub towards the centre. A mesh fence separates the hedgerow from the adjoining field. This has several gaps which are evidently used by mammals, likely to be badger and muntjac deer (Photograph 8).

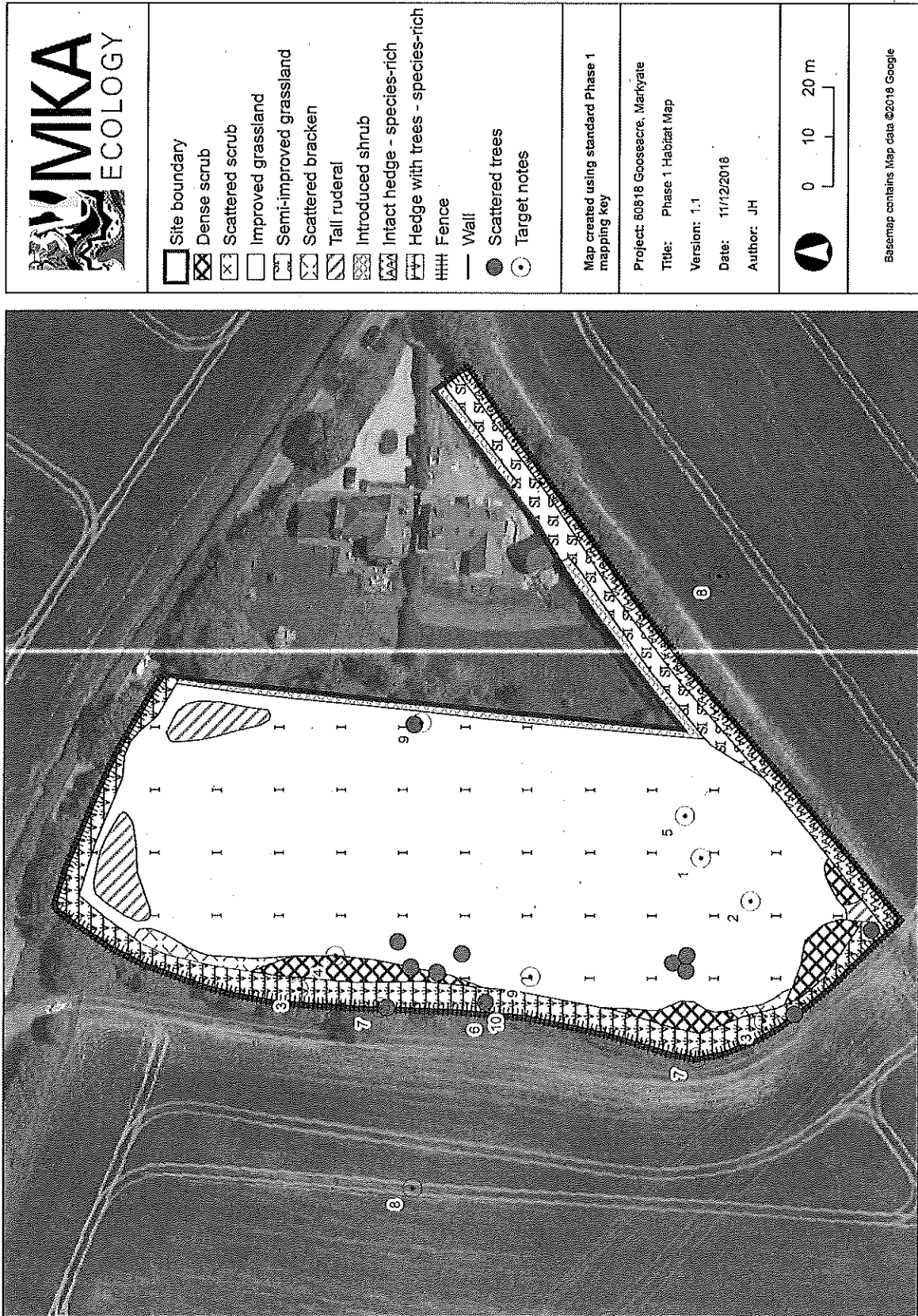
Scattered trees

A mixture of planted conifers, with four semi-mature trees to the west, are located variously around the Site. These include a range of native (yew *Taxus baccata*) and non-native species (cypress *Cupressus* sp.). In addition, three young silver birch have been recently planted in the south part of the grassland, with fencing measures and hoses leading from the property to the west to aid establishment.

Introduced shrub

Whilst forming a boundary hedge along the east boundary and north of the access track, the planted *Photinia* hedgerow is considered here as introduced shrub. It is understood to have been planted subsequent to an unsuccessful attempt to plant a native hedgerow.

Figure 4: Phase 1 habitat map of Gooseacre, Markyate



Target notes:

- 1 Badger droppings
- 2 Network of mammal tracks
- 3 Bird's nest
- 4 Well defined tracks across site
- 5 Flattened area
- 6 Mature ash with ivy - bat roost potential
- 7 Disused sett
- 8 Flint exposure - calcareous
- 9 Dung pits and snuffle holes
- 10 Active badger sett entrance

4.3. Protected species scoping survey

Plants

A number of records of notable and protected plant species were returned from the data search, with a combination of species indicative of ancient woodland, (e.g. bluebell *Hyacinthoides non-scripta*, Schedule 8 of The Wildlife and Countryside Act, 1981, as amended), arable systems (e.g. corn spurrey *Spergula arvensis* and dwarf spurge *Euphorbia exigua*, both listed as 'Vulnerable' on the English Red List), and calcareous grasslands, e.g. red hemp-nettle (Species of Principal Importance, NERC Act 2006 and 'Critically Endangered' on the English Red List). Several of the records originate from the Dedmansey Woods Ancient Woodland Inventory (AWI) site. The nearest record is of corn spurrey in the field margin around Park Spring, an isolated woodland 300m to the south of the site boundary. Two records of Hertfordshire Vulnerable (lady's mantle *Alchemilla filicaulis subsp. vestita*) and Hertfordshire Rare (blueish veilwort *Metzgeria violacea*) species were also returned.

Whilst no protected or notable plant species were identified during the survey, the location of the site on calcareous soils within an arable landscape, the presence of mature hedgerow and the presence of apparently undisturbed grassland gives rise to a **low to moderate** risk of protected or notable plant species being present. However, these are more likely to be on the outward edges of the site boundary.

Six records of Japanese knotweed *Fallopia japonica* were returned from the data search but no invasive species were identified during the field survey. There is considered to be a **low** risk of invasive species being on the development site.

Invertebrates

Nearly 700 records of invertebrates were returned from the data search, the majority being of lepidopterans. Several records of notable butterfly species characteristic of calcareous grasslands were returned, including small heath *Coenonympha pamphilus* (Species of Principal Importance, NERC Act. 2006) as well as species typical of woodland, hedgerow and copses such as purple emperor *Apatura*

iris (Wildlife and Countryside Act, 1981 as amended, Schedule 5a), white admiral *Limenitis camilla*, white-letter hairstreak *Satyrion w-album* (listed as 'Vulnerable' and 'Endangered' on the English Red List, respectively).

Suitable habitat for a range of invertebrate species is present on site, including the improved grassland, with abundance of herbaceous species such as common knapweed and other members of the Asteraceae (daisies and kin), and mature hedgerow. As a result, there is a **moderate to high** likelihood of important assemblages of invertebrates using the Site.

Amphibians

Only three records of amphibians, all common toad *Bufo bufo* (a Species of Principal Importance, NERC Act, 2006), were returned from the data search. No records of great crested newt were returned.

The grassland and hedgerow habitat are suitable for amphibians in their terrestrial phase. The nearest known pond is 600m to the north-east, associated with the Markyate Manor Farm. Others are 900m to the south-west and 1 km to the south, associated with Cheverrel's Green. No European Protected Species Licenses (EPSL) for amphibians were found within 2km of the site boundary, the nearest being over 10km to the north-west.

Given the combination of the paucity of records from the data search and the relative isolation of the site within an otherwise arable landscape means, we conclude that there is a **negligible** likelihood of protected amphibians being present.

Reptiles

Similarly to amphibians, very few records of reptiles were returned, with two slow-worm from Dedmansey Woods. Suitable habitat for reptiles for all stages in the life cycle are present at the site, the unmanaged grassland providing suitable foraging habitat and the mature hedgerow providing opportunity for hibernation. Similarly to the case with amphibians, we consider the isolation of the site and limited return from the data search to give rise to a **low** risk of reptiles being present.

Birds

A total of 22 species were recorded during the site visit. These species are shown in Table 7 together with their conservation status. It is important to note that this is not a full inventory of species for the site.

Over 100 records of birds were returned from the data search, including those listed on the Wildlife and Countryside Act, 1981 (as amended), namely barn owl *Tyto alba*, red kite *Milvus milvus*, brambling *Fringilla montifringilla* and fieldfare *Turdus pilaris*, the latter two being over wintering species. Several of the nearby AWI woodland are likely to provide suitable nesting habitat for red kite, including Park Spring 300m to the south.

Table 7: Bird species recorded during site visit at Gooseacre, Markyate

Common name	Systematic name	S1 W&CA ¹	BoCC ² Status	S41 SPI ³	Local PrSp ⁴
Sparrowhawk	<i>Accipiter nisus</i>	No	Green	No	No
Buzzard*	<i>Buteo buteo</i>	No	Green	No	No
Woodpigeon	<i>Columba palumbus</i>	No	Green	No	No
Green woodpecker	<i>Picus viridis</i>	No	Green	No	No
Kestrel	<i>Falco tinnunculus</i>	No	Amber	No	No
Magpie	<i>Pica pica</i>	No	Green	No	No
Jay	<i>Garrulus glandarius</i>	No	Green	No	No
Carrion crow	<i>Corvus corone</i>	No	Green	No	No
Goldcrest	<i>Regulus regulus</i>	No	Green	No	No
Blue tit	<i>Cyanistes caeruleus</i>	No	Green	No	No
Great tit	<i>Parus major</i>	No	Green	No	No
Coal tit	<i>Periparus ater</i>	No	Green	No	No
Skylark*	<i>Alauda arvensis</i>	No	Red	Yes	Yes
Long-tailed tit	<i>Aegithalos caudatus</i>	No	Green	No	No
Wren	<i>Troglodytes troglodytes</i>	No	Green	No	No
Blackbird	<i>Turdus merula</i>	No	Green	No	No
Fieldfare	<i>Turdus pilaris</i>	Yes	Red	No	No
Song thrush	<i>Turdus philomelos</i>	No	Red	Yes	Yes
Robin	<i>Erithacus rubecula</i>	No	Green	No	No
Dunnock	<i>Prunella modularis</i>	No	Amber	Yes	No
Meadow pipit*	<i>Anthus pratensis</i>	No	Amber	No	No
Chaffinch	<i>Fringilla coelebs</i>	No	Green	No	No

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

* Recording flying over or near the site only

Whilst mature standard ash and oak trees are present, the relative proximity to human habitation means there is a low probability of the above raptors nesting at the Site. Personal communication with the landowner suggests that barn owl have recently used the site for foraging and the grassland does provide suitable habitat. Barn owl is also a Hertfordshire rare breeding species. Other notable species associated with arable and/or hedgerow habitats were returned, including skylark *Alauda arvensis*, yellowhammer *Emberza citrinella*, and bullfinch *Pyrrhula pyrrhula*.

The hedgerow to the west provides the most suitable habitat for breeding birds, the mature woody species offering several opportunities for nesting birds, as evidenced by the presence of birds' nests, most likely to be from woodpigeon (Target note 3 (TN3), Photograph 12). Song thrush *Turdus philomelos* was recorded during the survey and is likely to nest in the boundary habitats. Similarly, goldcrest was also observed and this species may nest within the isolated conifers in the west of the grassland. The berry producing species hawthorn and blackthorn also provide suitable foraging habitat for overwintering species such redwing *Turdus iliacus* and fieldfare *T. pilaris*, the latter of which was recorded in a flock of approximately 75.

The likelihood of birds utilising the Site for breeding is considered to be **high**. The likelihood of the Site to support important local assemblages of bird species, or protected and notable bird species, is considered to be **moderate**.

Bats

Fourteen records of bats were returned from the data search, including brown long-eared bat *Plecotus auritus*, Daubenton's bat *Myotis daubentonii* and unidentified pipistrelle bats. The large ash on the west boundary (TN6) with ivy growth provides some potential for roosting bats. However, the value of the Site for bats comes largely from the presence of ideal commuting (hedgerow) and foraging (hedgerow and grassland) habitats. The nearest EPSL for bats as returned from a Natural England MAGIC Map data search was over 3km to the south-west.

The likelihood of roosting bats being present is considered to be **low** and the likelihood of the Site being used by commuting and foraging bats is considered to be **high**.

Badger

Fifty-three records of badger were returned from the data search. Whilst the spatial resolution of records is necessarily set low, it is evident that several of these records originate from Dedmansey Woods 1.3km to the west, as well as other locations near Markyate to the north. The Site and surrounding landscape provide ideal habitat for badger, with woodlands and mature hedgerows providing suitable sett building opportunity and arable fields with a potential source of food.

Several signs of badger were identified during the survey. Several tracks leading across the grassland between the hedgerow and adjoining garden were identified (TN2 and TN4). Whilst some are more

likely to be from muntjac deer *Muntiacus reevesi*, several tracks were interspersed with droppings consistent with badger and snuffle holes (badger feeding signs, TN9). Two apparently disused setts/sett entrances (e.g. Photograph 9) were identified on the west boundary (TN7) and one sett entrance at the base of the large ash tree (TN10, Photograph 10), the presence of fresh bedding at the entrance indicating that this is likely to be active. This is likely to be an outlying sett used by one or two individuals and perhaps only occasionally. However, the presence of several droppings and tracks indicates that there is likely to be more than one individual using the Site. The site is therefore considered to have a **confirmed** presence of badger.

Hazel dormouse

Thirty-two records of hazel dormouse were returned from the data search. Of these, 17 originate from Dedmansey Woods and 15 are from Studham Common, 1.9km to the south west. The hedgerow along the west boundary provides suitable habitat for this species. The only available corridor for dispersal from Dedmansey Woods for hazel dormouse is along the Buckwood Road, which has a mature hedgerow along its south side and is 1.4km at its shortest extent.

We conclude that there is a **low** likelihood of hazel dormouse being present at the Site.

Other mammals

Six records of brown hare *Lepus europaeus*, two records of harvest mouse *Micromys minutus* and two records for hedgehog *Erinaceus erinaceus*, were returned from the data search. All are Species of Principal Importance. The grassland habitats and surrounding arable habitats are likely to support brown hare and the hedgerow habitat is suitable for both harvest mouse and hedgehog. There is a **moderate** likelihood of all three species being present.

No records of otter or water vole were returned and, given the absence of any suitable habitat, these species are not considered further.

From personal communication from the landowner and from observation in the field, it is likely that Reeves' muntjac use the Site for foraging and for accessing fruit trees within the gardens to the east.

5. ECOLOGICAL CONSTRAINTS, OPPORTUNITIES AND RECOMMENDATIONS

This section outlines key ecological issues for consideration, recommendations for further work and ecological enhancements where appropriate. Given the well-developed nature of the existing plans and landscaping, many of the recommendations are essentially modifications to the existing outline plans

Off-site habitats

The proposed development is unlikely to have any adverse impacts on any off-site habitats. Given the nature of the proposed development as a single dwelling residential property, it does not fall within a Natural England Site of Special Scientific Interest Impact Risk Zone (SSSI IRZ, Natural England, 2016).

On-site habitats

The species rich hedgerow on the west boundary provides a large portion of the ecological value of this site. Hedgerows are a National Habitat of Principal Importance (NERC Act, 2006) and come under the Local Habitat Action Plan for Farmland. The hedgerow and adjoining scrub at the development site shows demonstrable value to nesting and foraging birds, and badger, as well as likely value to commuting and foraging bats and invertebrates. We endorse the recommendations implied from the Outline Landscape Masterplan that this hedgerow and scrub should be retained. Furthermore, it should be protected at all stages of the construction process by the erection of suitable fencing (e.g. Heras or similar) at a distance of 10 metres from the hedgerow.

Recommendation 1

Retain and protect the west and south hedgerows during the construction phase of development.

Reptiles

All native British reptiles are protected under Schedule 5 of the Wildlife and Countryside Act (1981), as amended, which makes it an offense to wilfully or recklessly kill or injure them. Reptiles are also listed as Species of Principal Importance on Section 41 of the NERC Act (2006).

Whilst suitable habitats are present on site in the form of a mature hedgerow and grassland, the paucity of reptile records returned from the data search make the Site of low risk to this taxonomic group.

Consequently, we propose that the clearance of vegetation be conducted under a method statement which will detail best practice guidance for minimising the risk of harm to reptiles. This will include strict instructions to cease work if a reptile is identified during the works and obtain immediate advice from an experienced ecologist. This approach is considered to adequately reflect the low risk of this taxonomic group using the Site.

Recommendation 2

Undertake site clearance and construction activities at the Site under a strict method statement to minimise the risk of harm to reptiles.

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 3

Schedule vegetation and building 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.

Bats

Bat roosting behaviour, commuting and foraging activity can additionally be dramatically affected by artificial lighting (BCT, 2018). Given the extensive proposed provision for bats within the proposed building, it is strongly recommended that any proposed exterior lighting is 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.

Recommendation 4

Light pollution from any lighting should be minimised both during and after the construction phase. A sensitive lighting scheme should be developed and secured through a planning condition to allow for suitable roosting and foraging areas for bats within the site with maximum use of down lighting and hoods where necessary.

Badgers

Badger setts and badgers occupying a sett are protected under the Protection of Badgers Act 1992. The presence of an active outlying or satellite sett was confirmed during the survey, this being located at the base of a mature ash within the west hedgerow boundary. Several signs of badger activity (droppings, tracks and feeding signs) were also identified, as were two disused setts, each with multiple entrances.

Given the size of the identified sett and the likelihood, given its status as an outlying sett, it will be sufficient to avoid impacts to it by the use of protective fencing. Protective fencing has been recommended above for the entire hedgerow and we reiterate the need to use such fencing to avoid impacts on badger.

Recommendation 5

Retain and protect the west hedgerow using fencing to avoid impacts on badgers.

Badgers will frequently dig new and/or re-use old setts as their use of territories changed over time. It is therefore possible that the presently disused setts along the hedgerow may be re-used in the future. It is therefore recommended that a badger survey is conducted before the commencement of construction to assess how and to what extent badgers' use of the Site has changed.

Recommendation 6

A pre-commencement badger survey should be conducted.

Hazel dormouse

The west hedgerow provides suitable habitat for hazel dormouse and Ancient Woodlands within 1.5km of the site boundary have had this species recorded. However, there is just single likely corridor of dispersal for this species to the Site and so the likelihood of hazel dormouse being present is considered to be low.

Hazel dormouse is listed on Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended) and a Hertfordshire BAP species, and it is an offence to deliberately capture, injure or kill hazel dormouse, destroy their nests and nesting places, or disturb a dormouse whilst within a resting place

The retention and protection of the existing hedgerow as described above will prevent any adverse effects on hazel dormouse.

Recommendation 7

Retain and protect the west hedgerow using fencing to avoid impacts on hazel dormouse.

Brown hare

Brown hare are often found in mosaics of open farmland and woodland, such as that surrounding the Site. There is therefore a risk that brown hare may also use the grassland within the site-boundary. Whilst there is no formal legal protection for brown hare, they are a Species of Principal Importance (NERC Act, 2006). As such, we recommend that site clearance in preparation of construction work should avoid the breeding period for this species, which runs from February through to August. If these timings are not feasible the area for clearance should be checked for nests or 'forms' containing leverets prior to works.

Recommendation 8

Ground clearance should avoid the breeding season for the species and where this is not feasible a check for forms or leverets should be undertaken before works.

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. The delivery of these enhancements will be critical to ensuring that the proposed development meets the requirement for enhancement under paragraph 79 of the NPPF.

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 the native plant species diversity and provide more ecologically valuable habitats and greater diversity of other dependent taxonomic groups. We endorse the broad principles of the overall Landscape Master Plan (Figure 2).

However, in order to tailor enhancements to ensure the success of habitat creation and enhancement, we recommend that soil samples are taken from the grassland site in order to inform decision making as to how the meadow in the north is created. For example, if the underlying soil is too nutrient rich, soil stripping may be the best course of action, with a dedicated seed mixture applied, essentially starting afresh. Alternatively, restoration may be achieved by the management of the existing grassland. The abundance of grasses and apparently lack of recent previous management suggest that the former course of action may provide the best results. Whilst the local geology is calcareous in nature and calcareous grasslands are a feature of the Chiltern AONB, soil samples will also allow a targeting of appropriate seed mixes appropriate to the local pH at the Site.

Recommendation 9

Soil samples should be taken across the site and a range of depths to establish baseline conditions and the appropriate restoration method for the meadow grassland.

We endorse the creation of an orchard and tree planting. We also endorse the replacement of the existing laurel hedge/introduced shrub with a native species rich hedgerow with species found in the existing hedgerow on- and off-site.

Recommendation 10

It is recommended that native British species are incorporated within the planting scheme for the meadow grassland, orchard, east boundary hedgerow and tree planting in order to enhance the overall value of the site for biodiversity, in line with the requirements of the NPPF.

The plans include the incorporation of green roofs. The addition of these additional areas of habitat will further enhance biodiversity, provided the substrate is appropriately sourced and the planting/seed mix to be applied is of an appropriate type. We recommend that a calcareous grassland seed mix is used, this being in keeping with local geology and a defining habitat of the AONB.

Recommendation 11

The proposed green roofs are seeded with a calcareous grassland seed mix and are designed using an appropriate substrate to accommodate this.

We also endorse the inclusion of provision for nesting birds and bats within the designs for the building, including within the chimney structure on the south side of the building (Figure 3). We recommend that bird boxes that are integrated within the building are designed for use by swift *Apus apus* and house sparrow. Swift and house sparrow are Amber and Red listed Birds of Conservation Concern respectively (Eaton *et al.*, 2015) and nest in buildings. The height afforded by the chimney structure in particular is ideal for swift. Natterer's bat *Myotis nattereri* is a Hertfordshire BAP species and will use typical bat boxes, as well as tree holes and barns. A proportion of the bat boxes should be integrated into the fabric of the building, as implied within currently available drawings (Figure 3).

Recommendation 12

A minimum of ten bird boxes should be installed at the site, to include provision for swift, house sparrow and generalist species.

Recommendation 13

Provisions for roosting bats at the site should to include a minimum of ten integrated bat bricks or bat boxes.

The key to the success of the aforementioned habitat enhancements and restoration is their long-term management. It is therefore recommended that an Ecological Management Plan be developed for the Site and the adherence to this plan to ensure long lasting biodiversity improvements.

Recommendation 14

To ensure that new ecological features are appropriately established and managed, an Ecological Management Plan should be developed.

Summary of recommendations

Table 8 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 8: Summary of recommendations at Gooseacre, Markyate

Species	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Habitats		<ul style="list-style-type: none"> - Installation of protective fencing. - Soil samples to guide grassland restoration strategy. - Development of appropriate meadow restoration technique. 	<ul style="list-style-type: none"> - Adherence to fencing avoidance/protection measures. - Installation of appropriate substrate for green roof. 	<ul style="list-style-type: none"> - Include native planting in design scheme. - Green roofs. - Orchard and meadow creation

Species	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Reptiles		- Development of method statement for grassland clearance.	- Method statement for grassland removal	- Habitat creation as above
Birds	- Bird boxes and native planting		- Timing of works for vegetation removal OR further survey work - Incorporate integrated bird boxes into new buildings	- Bird boxes and native planting
Bats	- Development of a sensitive lighting scheme.		- Incorporate integrated bat boxes into new buildings. - Implementation of sensitive lighting scheme.	- Bat boxes and native planting. -
Badgers	- Pre-commencement survey for badger	- Installation of protective fencing.	- Adherence to avoidance/protection measures	- Grassland enhancement and creation of orchard.
Hazel dormouse		- Installation of protective fencing.	- Adherence to avoidance/protection measures	
Brown hare		- Avoidance of breeding season OR pre-construction checks for leverets/forms	- Adherence to avoidance/protection measures	

6. CONCLUSIONS

The Site at Gooseacre, Markyate is being proposed for the building of a single residential dwelling. As well as innovative architectural methods, the proposals include several biodiversity enhancement measures, namely the enhancement or restoration of the existing meadow, installation of green roofs, bird and bat boxes, creation of an orchard, the planting of additional trees and the replacement of existing non-native hedging with species rich native planting. Provided these measures are appropriately installed and, crucially, carefully managed in the future, the proposals have the capacity to significantly enhance the biodiversity of the immediate setting.

Few ecological constraints exist and none will significantly alter the proposed development. The installation of protective fencing to protect the west hedgerow during the construction phase will avoid the majority of the constraints described, including a risk to disturbance of badgers, hazel dormice and bats.

A Biodiversity Statement will accompany this report. This statement will formally and objectively measure the potential biodiversity gains of the proposed development using the Defra Biodiversity Offsetting metric. To establish the strategy for the restoration of the grassland habitat which provides a substantial area of the proposals, we recommend the collection and analysis of soil samples.

7. REFERENCES

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8. APPENDICES

8.1. 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
<i>Amphibians</i>		
Great crested newt <i>Triturus cristatus</i> Natterjack toad <i>Epidalea calamita</i>	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended) Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> ◦ 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.
<i>Reptiles</i>		
Common lizard <i>Zootoca vivipara</i> Adder <i>Vipera berus</i> Slow-worm <i>Anguis fragilis</i> Grass snake <i>Natrix helvetica helvetica</i>	Part of Sub-section 9(1) of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> ◦ Intentionally kill or injure individuals of these species (Section 9(1)).

Subject	Legislation (England)	Relevant prohibited actions
Sand lizard <i>Lacerta agilis</i> Smooth snake <i>Coronella austriaca</i>	Full protection under Section 9 of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> ◦ 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.
<i>Birds</i>		
All wild birds	Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> ◦ 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)	<ul style="list-style-type: none"> ◦ 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.
<i>Mammals</i>		
Bats (all UK species)	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended)	<ul style="list-style-type: none"> ◦ 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)	<p>distribution or abundance of the species);</p> <ul style="list-style-type: none"> ◦ Damage or destroy a bat roost; ◦ Intentionally or recklessly disturb a bat at a roost; or ◦ Intentionally or recklessly obstruct access to a roost. <p>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.</p>
Badger <i>Meles meles</i>	Protection of Badgers Act 1992	<p>Under Section 3 of the Act:</p> <ul style="list-style-type: none"> ◦ 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. <p>A sett is defined legally as any structure or place which displays signs indicating current use by a badger (Natural England 2007).</p>
Hazel dormouse <i>Corylus avellana</i>	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended)	<ul style="list-style-type: none"> ◦ Intentionally or deliberately capture or kill, or intentionally injure; ◦ Deliberately disturb or intentionally or recklessly disturb them in a place used for shelter or protection;

Subject	Legislation (England)	Relevant prohibited actions
	Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> ◦ 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 <i>Lutra lutra</i>	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended)	<ul style="list-style-type: none"> ◦ 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.
	Section 9(4)(b) and (c) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	
Water vole <i>Arvicola amphibius</i>	Section 9 of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none"> ◦ 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.
<i>Crustaceans</i>		

Subject	Legislation (England)	Relevant prohibited actions
White-clawed crayfish <i>Austropotamobius pallipes</i>	Section 9(1) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	<ul style="list-style-type: none">Intentionally kill, injure or take white-clawed crayfish by any method.

Conservation of Habitats and Species Regulations 2017 (as amended)

Full legislation text available at: <http://www.legislation.gov.uk/ukxi/2017/1012/contents/made>

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/collections/revised-national-planning-policy-framework>

A revised NPPF was published on 24 July 2018 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 170 to 183 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".

8.2. Appendix 2: Phase 1 Habitat 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.

Dense scrub

Common name	Systematic name	Relative abundance
Bramble sp.	<i>Rubus fruticosus</i> agg.	D
Hazel	<i>Corylus avellane</i>	F
Bracken	<i>Pteridium aquilinum</i>	O
Hawthorn	<i>Crataegus monogyne</i>	O

Scattered scrub

Common name	Systematic name	Relative abundance
Blackthorn	<i>Prunus spinosa</i>	D
Bracken	<i>Pteridium aquilinum</i>	O

Scattered trees

Common name	Systematic name	Relative abundance
Cypressus sp.	<i>Cupressus</i> sp.	O
Douglas fir	<i>Pseudotsuga menziesii</i>	O
Norway spruce	<i>Picea abies</i>	O
Silver birch	<i>Betula pendula</i>	O
White fir	<i>Abies concolor</i>	O
Yew	<i>Taxus baccata</i>	O

Improved grassland

Common name	Systematic name	Relative abundance
Cock's-foot	<i>Dactylus glomerata</i>	A
Common knapweed	<i>Centaurea nigra</i>	A
False oat-grass	<i>Arrhenatherum elatius</i>	A
Meadow fescue	<i>Festuca pratensis</i>	A
Yarrow	<i>Achillea millefolium</i>	F
Cleavers	<i>Galium aparine</i>	F
Common field-speedwell	<i>Veronica persica</i>	F
Common nettle	<i>Urtica dioica</i>	F
Common vetch	<i>Vicia sativa</i>	F

Common name	Systematic name	Relative abundance
Daisy	<i>Bellis perennis</i>	F
Hairy tare	<i>Vicia hirsuta</i>	F
Hogweed	<i>Heracleum sphondylium</i>	F
Ribwort plantain	<i>Plantago lanceolata</i>	F
Wild carrot	Apiacea. indet	F
Annual meadow-grass	<i>Poa annua</i>	O
Bramble	<i>Rubus fruticosus</i>	O
Broad-leaved dock	<i>Rumex obtusifolius</i>	O
Common bent	<i>Agrostis capillaris</i>	O
Common ragwort	<i>Senecio jacobaea</i>	O
Cowslip	<i>Primula veris</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	O
Creeping thistle	<i>Cirsium arvense</i>	O
Dove's-foot crane's-bill	<i>Geranium molle</i>	O
Ground-ivy	<i>Glechoma hederacea</i>	O
Lady's bedstraw	<i>Galium verum</i>	O
Meadow buttercup	<i>Ranunculus acris</i>	O
Oxeye daisy	<i>Leucanthemum vulgare</i>	O
Perennial rye-grass	<i>Lolium perenne</i>	O
Red fescue	<i>Festuca rubra</i> agg.	O
Selfheal	<i>Prunella vulgaris</i>	O
Tall fescue	<i>Festuca arundinacea</i>	O
Dog rose	<i>Rosa canina</i>	R

Poor semi-improved grassland

Common name	Systematic name	Relative abundance
Broad-leaved dock	<i>Rumex obtusifolius</i>	A
Perennial rye-grass	<i>Lolium perenne</i>	A
Red fescue	<i>Festuca rubra</i> agg.	A
Smooth hawk's-beard	<i>Crepis capillaris</i>	A
Annual meadow-grass	<i>Poa annua</i>	F
Common nettle	<i>Urtica dioica</i>	F
Creeping thistle	<i>Cirsium arvense</i>	F
Ribwort plantain	<i>Plantago lanceolata</i>	F
Autumn hawkbit	<i>Scorzoneroides autumnalis</i>	O
Bramble sp.	<i>Rubus fruticosus</i> agg.	O
Broad-leaved willowherb	<i>Epilobium montanum</i>	O
Cleavers	<i>Galium aparine</i>	O

Common name	Systematic name	Relative abundance
Common ragwort	<i>Senecio jacobaea</i>	O
Common vetch	<i>Vicia sativa</i>	O
Dove's-foot crane's-bill	<i>Geranium molle</i>	O
Goat willow	<i>Salix caprea</i>	O
Lesser burdock	<i>Arctium minus</i>	O
Yarrow	<i>Achillea millefolium</i>	O
Barren brome	<i>Anisantha sterilis</i>	R
Common knapweed	<i>Centaurea nigra</i>	R
Hedge mustard	<i>Sisymbrium officinale</i>	R
Bracken	<i>Pteridium aquilinum</i>	D
Common nettle	<i>Urtica dioica</i>	D

Introduced shrub

Common name	Systematic name	Relative abundance
Red photinia	<i>Photinia sp.</i>	D

Intact hedge – species-rich

Common name	Systematic name	Relative abundance
Hornbeam	<i>Carpinus betulus</i>	D
Wild privet	<i>Ligustrum vulgare</i>	A
Hawthorn	<i>Crataegus monogyna</i>	F
Field maple	<i>Acer campestre</i>	O
Holly	<i>Ilex aquifolium</i>	R

Hedge with trees – native species-rich

Common name	Systematic name	Relative abundance
Hazel	<i>Corylus avellana</i>	A
Blackthorn	<i>Prunus spinosa</i>	F
Hawthorn	<i>Crataegus monogyna</i>	F
Ash	<i>Fraxinus excelsior</i>	O
Dog rose	<i>Rosa canina</i>	O
Field maple	<i>Acer campestre</i>	O
Pedunculate oak	<i>Quercus robur</i>	O
Elder	<i>Sambucus nigra</i>	R

8.3. Appendix 3: Site photographs

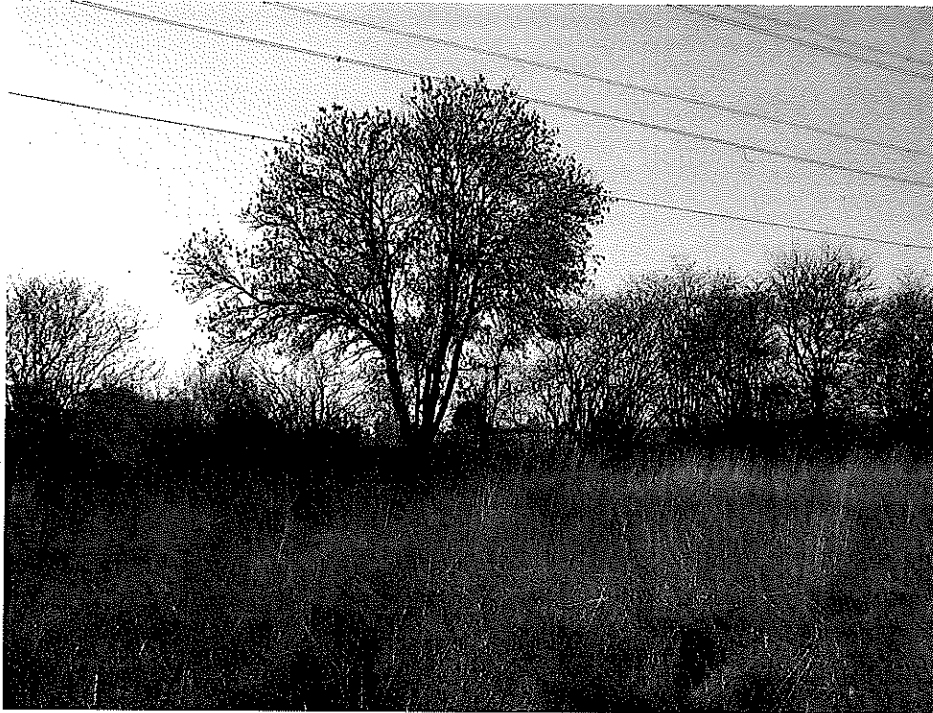
Photograph 1: Hedgerow (left), poor semi-improved grassland/track (centre) and introduced shrub/hedge (right)



Photograph 2: View from end of grassy track to west boundary



Photograph 3: View to south-west corner; improved grassland (foreground) and hedgerow with trees



Photograph 4: Planted hedgerow (south boundary), view from proposed garage area



Photograph 5: Hedgerow (left) and scattered conifers (centre)



Photograph 6: View to north boundary hedge, grassland and scattered bracken (left)



Photograph 7: Scattered bracken



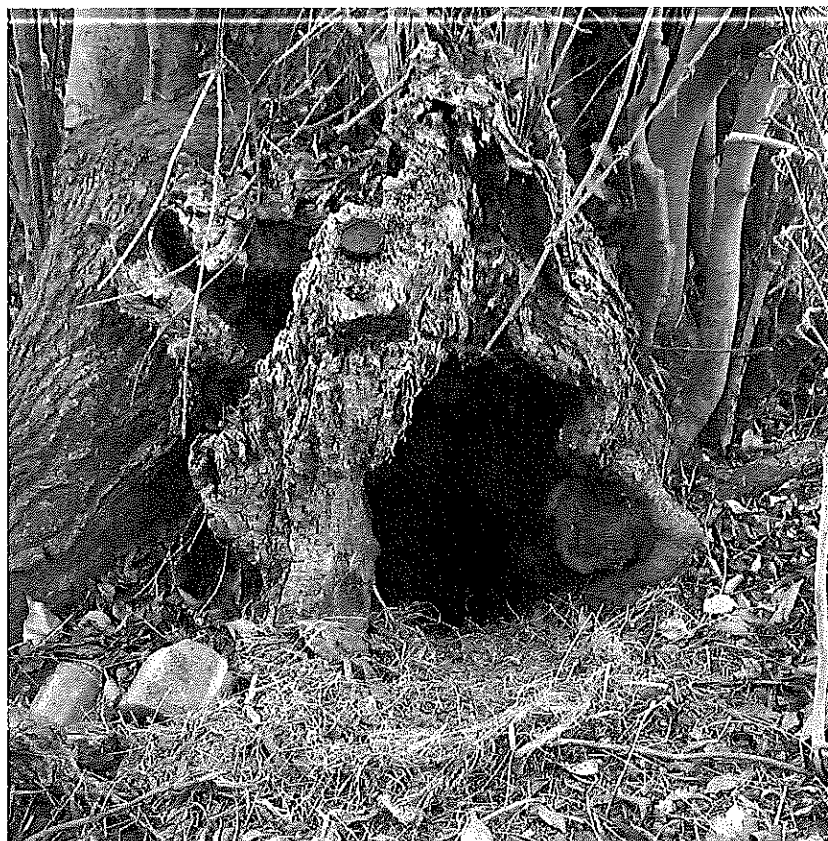
Photograph 8: Example of gap in fence with track leading to and from (lens cap for scale 45mm)



Photograph 9: Example of disused sett spoil heap, hole and gap under fence



Photograph 10: Active badger sett with fresh bedding at entrance (lens cap for scale 45mm)



Photograph 11: Example track system (near west boundary)



Photograph 12: Bird nest in west boundary hedgerow

