

**MKA**  
ECOLOGY

# **Preliminary Ecological Appraisal**

Rainhill Spring, Hemel Hempstead

|                              |  |
|------------------------------|--|
| <b>Site</b>                  | <i>Rainhill Spring, Hemel Hempstead, HP3 0DP</i> |
| <b>Project number</b>        | <i>146023</i>                                    |
| <b>Client name / Address</b> | <i>David Spivack</i>                             |

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|                      |   |                    |
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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.



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 July 2023, MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal of Rainhill Spring, Hemel Hempstead to support a retrospective planning application. 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 14 July 2023.

The Site is made up of two areas, one being a paddock to the east of the main house, currently used to graze a small number of animals, comprised of modified grassland with scattered trees. The second being an area of grassland to the south of the main house, where a shelter and large pond have recently been constructed. Habitats present in this area include long swarded *Arrhenatherum* neutral grassland, areas of bramble scrub, and tree lines.

The area of woodland between the main house and the southern area of grassland is designated as ancient semi-natural woodland and is present on the ancient woodland inventory.

The Site has the potential to support a range of species including amphibians, reptiles, birds, bats and hedgehog. No further works or impacts are anticipated. Enhancements to improve the Site's overall biodiversity value have been recommended.

## 2. INTRODUCTION

### 2.1. Aims and scope of Preliminary Ecological Appraisal

In July 2023, MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal at Rainhill Spring, Hemel Hempstead by David Spivack in order to support a retrospective planning application for the construction of an animal shelter and pond in the southern area of grassland at the Site.

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;
- 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 Rainhill Spring. It is located in a rural area approximately 3km from Hemel Hempstead and falls under the authority of Dacorum Borough Council (grid reference: TL 02667 04483).

The area of grassland to the east of the main house is currently used to graze a small number of animals; the grassland to the south is largely left unmanaged and has a long sward with areas of bramble scrub. A large pond has recently been constructed, replacing a smaller pond, as well as a large shelter in the north-western corner of the field. Detail information and/ or photographs of the Site prior to the works being undertaken are not available. The applicant intends to rotationally graze the two fields as part of the retrospective application.

### 2.3. 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 Environment Act 2021;
- 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.

Dacorum Borough Council has produced a draft Local Plan which covers a number of policies relating to biodiversity and habitat conservation, including:

- **Policy DM28 - Protection of Sites**
  - 1. Important nature conservation sites, habitats and sites of geological and geomorphological interest will be protected, maintained and enhanced.
  - 2. Development proposals which are likely to cause harm to sites of nature conservation or geological interest will only be permitted in exceptional circumstances where the need for the development significantly and demonstrably outweighs the harm and where:
    - a. all necessary measures to mitigate the impact have been put in place; and
    - b. compensatory provision in line with mitigation hierarchy (i.e., avoidance - minimisation - rehabilitation/restoration - compensation) can be secured to ensure that the overall coherence of the site is protected and with the intent to achieve a net gain in biodiversity
  - 3. The above objectives will be applied as follows:
    - a. for sites of International importance:
      - i. there are imperative reasons of overriding public interest;
      - ii. there are no suitable alternatives to the proposal;
    - b. for sites of National importance
      - i. the benefits of the development, at this site, clearly outweigh the adverse impacts on the site;
      - ii. there are no suitable alternatives to the proposal;
    - c. for sites of county, sub-regional and local importance:
      - i. the local development needs significantly outweigh the biodiversity or geological conservation value of the site.

- 4. Evidence will be required in the form of up to date, comprehensive ecological surveys undertaken in accordance with industry guidelines and standards prior to the submission of an application.
- **Policy DM29 - Protected Species and Priority Species and Habitats Policy**
  - 1. Development which would result in damage to or loss of habitats of principal importance or the habitats of species of principal importance will not be permitted except:
    - a. in exceptional circumstances where the need for, and benefits of the development significantly and demonstrably outweigh the harm it would cause to the site; and
    - b. where the loss can be mitigated and compensation provided.
  - 2. Where there is a reasonable likelihood of the presence of statutorily protected species or their habitats, development will not be permitted unless it has been demonstrated that the proposed development will not result in a negative impact upon those species and habitats.
- **Policy DM31 – Chilterns Beechwoods Special Area of Conservation**
  - 1. The Council will expect all relevant development proposals to assist in the conservation and enhancement of the biodiversity, character, appearance and landscape setting of the Chilterns Beechwoods Special Area of Conservation (SAC). Proposals should have regard to the reasons for the SACs designation and its conservation objectives.
  - 2. Where there are grounds to believe that the SAC be affected by proposed development, applicants must establish the extent of potential impact. This evidence should inform appropriately designed plans and mitigation measures. Proposals must demonstrate that any effects of development would not be adverse to the integrity of the SAC.
  - 3. Open Space Requirements and Mitigation for Recreational Impacts
    - a. Allocated Growth Areas or Major residential development - In order to mitigate against the potential or identified adverse effects of additional development on Dacorum, all development that would result in a net increase in homes within the Borough will be required to:
      - i. Point of destination: assist in the conservation and enhancement of the biodiversity, character and appearance and landscape setting of the Chilterns Beechwoods SAC by making financial contributions towards the Chilterns Beechwoods On-site and Access Management Strategy Scheme (to be produced), or any subsequent scheme which replaces this. Details will be set out in the Chilterns Beechwoods SAC SPD; and 119 Dacorum Emerging Strategy for Growth (2020 - 2038)

- ii. Point of Origin: demonstrate that adequate measures are put in place to avoid or mitigate any potential increase in visitor pressure on the SAC. This will require the provision of bespoke on-site mitigation to form part of the proposed development. Such provision will need to be:
  - A. delivered 'up front' to reduce pressures placed upon the SAC;
  - B. determined in agreement with Natural England and the National Trust; and
  - C. be proportionately addressed in accordance with the mitigation hierarchy (mitigation - offsetting within the locality - compensation in the form of habitat);
- iii. Where ii (A-C) cannot be achieved, a meaningful proportion of Natural Green Space or access to Natural Green Space must be provided. This could involve:
- iv. A. providing new green spaces, SANGS or Country Parks;
  - B. improving the naturalness, attractiveness or facilities on offer at existing green spaces;
  - C. improving access to green space; or
  - D. improving connectivity between green spaces (where this development proposal would not contribute to a material increase in recreational pressure on designated sites).
- v. Points iii (A. - D). must include a strategy demonstrating how they deliver for both residents and tourists:
  - A. sufficient open space proposals, and where relevant
  - B. options for Suitable Alternative Natural Greenspace of an appropriate quality and in the right place
    - b. Minor residential development - All minor residential development will make financial contributions towards the Chilterns Beechwoods On-site and Access Management Strategy Scheme (19), or any subsequent scheme which replaces this. Details will be set out in the Chilterns Beechwoods SAC SPD.
  - 4. Mitigation for Air Quality impacts: Major development must contribute towards the Chilterns Beechwoods Air Quality Mitigation Scheme (20), or any subsequently agreed scheme, unless it can be demonstrated that the development would not result in any adverse impact on air quality at Chilterns Beechwoods SAC either alone or in combination with other development.
  - 5. The Chilterns Beechwoods Special Area of Conservation and the zones of influence are defined on the Policies Map.

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, 2<sup>nd</sup> 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)<br><a href="http://www.magic.gov.uk">www.magic.gov.uk</a> | Information on local, national and international statutory protected areas.                     | 26/07/2023     |
| Hertfordshire Environmental Records Centre  | Information on protected and notable sites and species within 2km of the Site (TL 02667 04483). | 26/07/2023     |
| Ordnance Survey maps and aerial photography   | Information on habitats and connectivity between the Site and the surrounding landscape         | 26/07/2023     |
| Plantlife Important Plant Areas<br>Buglife Important Invertebrate Areas   | Information on whether the site falls within one of these areas                                 | 26/07/2023     |

#### 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 a Samsung Tablet in a Geographic Information System (GIS), in this instance QField, following a modified UK Habs Colour Mapping Pallet. 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. 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 Stanbury *et al.*, 2021 (see Appendix 1).

Protected and notable species considered within the protected species scoping survey for Rainhill Spring include the following:

- Plants and fungi: Species listed on Schedule 8 of the Wildlife and Countryside Act 1981 such as bluebell *Hyacinthoides non-scripta* and Deptford pink *Dianthus armeria* which is also listed on Section 41 of the NERC Act 2006, as is frog orchid *Coeloglossum viride* and white helleborine *Cephalanthera damsonium*.
- Invertebrates: Species listed on Section 41 of the NERC Act 2006 including brown hairstreak *Thecla betulae*, white-letter hairstreak *Satyrrium w-album* and small blue *Cupido minimus*.
- 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 helvetica helvetica*.
- Birds: With special reference to species listed under Schedule 1 of The Wildlife and Countryside Act 1981 (as amended) and Species of Principal Importance.
- 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*, polecat *Mustela putorius* and European beaver *Castor fiber*.

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, and report written, by India Wedge, Consultant Ecologist at MKA Ecology Limited; India has four years' experience in ecological consultancy and holds a Level 1 bat licence from Natural England. The report has been reviewed by Will O'Connor ECol MCIEEM, Principal Ecologist at MKA Ecology Ltd. Will has over 15 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*                                   |
|------------|----------------|---|
| 14/07/2023 | 11.00          | Wind: 2<br>Cloud: 8<br>Temp: 13°C<br>Rain: Light rain |

\*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.

The works had already been completed at the time of survey; therefore, condition and makeup of habitats present prior to the works have been ascertained using historic satellite imagery, information from data obtained from the local records centre and discussions with the applicant.

## 4. RESULTS

### 4.1. Desktop study

An ecological desktop study was completed for the Site and the surrounding 2km. Data provided by Hertfordshire Environmental Records Centre (HERC) 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 4.3 below).

One international statutorily designated site was identified within 10km, Chilterns Beechwoods Special Area of Conservation. Due to the nature and scale of the works undertaken and the distance to the SAC, no impacts are considered to have taken place and this international site is not considered further within this report.

No national statutorily designated sites identified within 2km of the Site as part of the desktop study. Further details of the SAC site are detailed below in Table 4.

**Table 4: Statutorily designated sites within 2km of Rainhill Spring**

| Site name                | Area (ha) | Distance and direction | Reasons for selection   |
|--------------------------|-----------|------------------------|---|
| Chilterns Beechwoods SAC | 1276.48   | 5.8 km NW              | Site represents extensive tract of ancient semi-natural beech <i>Fagus sylvatica</i> . The woodland is an important part of a mosaic with species-rich chalk grassland and scrub. |

Seventeen Local Wildlife Sites (LWS) within 2km of the Site were returned by HERC. Due to the nature and scale of the works undertaken, only sites within 1km have been considered within this assessment. This includes seven LWS, details of non-statutorily designated sites identified as part of the desktop study are displayed in Table 5 below. However, it is considered unlikely that any impacts have occurred on these non-statutorily designated sites outlined below.

**Table 5: Non-statutorily designated sites within 2km of Rainhill Spring**

| Site name   | Area (ha) | Distance and direction | Reasons for selection  |
|---|-----------|------------------------|--|
| Shothanger Way<br>Grassland East<br>(74/057/01)       | 0.5       | 180 NE                 | Site supporting secondary woodland and scrub with open areas of rough grassland. Several woodland indicators are present in the ground flora including Bluebell <i>Hyacinthoides non-scripta</i> , Wood Meadow-grass <i>Poa nemoralis</i> and a violet <i>Viola</i> sp. The grass sward supports a good mix of species, i.e., Agrimony <i>Agrimonia eupatoria</i> , Common Knapweed <i>Centaurea nigra</i> , Meadow Buttercup <i>Ranunculus acris</i> and Common Spotted-orchid <i>Dactylorhiza fuchsii</i> .  |
| Bury Wood (near<br>Sheethanger<br>Common)<br>(74/002) | 7.46      | 390m NE                | Ancient semi-natural Pedunculate Oak <i>Quercus robur</i> , Hornbeam <i>Carpinus betulus</i> coppice-with-standards woodland which now supports a canopy of mixed species. The ground flora is diverse and supports numerous indicators such as Bluebell <i>Hyacinthoides non-scripta</i> , Wood Sedge <i>Carex sylvatica</i> , Broad Buckler-fern <i>Dryopteris dilatata</i> and Yellow Archangel <i>Lamium galeobdolon</i> .   |
| Gorsefield Wood<br>& Ramacre Wood<br>(74/013)         | 8.0       | 450 NW                 | Ancient semi-natural mixed woodland with Pedunculate Oak <i>Quercus robur</i> and Hornbeam <i>Carpinus betulus</i> coppice and standards plus Beech <i>Fagus sylvatica</i> , Ash <i>Fraxinus excelsior</i> , Silver Birch <i>Betula pendula</i> , Hazel <i>Corylus avellana</i> and Sycamore <i>Acer pseudoplatanus</i> . The ground flora supports many woodland indicators including locally abundant Bluebell <i>Hyacinthoides non-scripta</i> plus Wood Sedge <i>Carex sylvatica</i> , Pignut <i>Conopodium majus</i> , Broad Buckler-fern <i>Dryopteris dilatata</i> , Wood Melick <i>Melica uniflora</i> Wood Millet <i>Milium effusum</i> . |
| Sheethanger<br>Common West<br>(65/002/01)             | 20.39     | 470m NE                | Former chalk grassland and scrub on a steep north-facing chalk escarpment. The area is now mostly a golf course or secondary woodland but there are pockets of rich chalk grassland by an old chalk pit and within the roughs.   |

| Site name  | Area (ha) | Distance and direction | Reasons for selection   |
|--|-----------|------------------------|---|
| Bovingdon Reach, Three Crofts, Barnfield, Dellfield (65/084) | 29.94     | 550 N                  | Site comprises secondary grassland developed on set-aside arable, supporting a range of grass and herb species including ruderal and field weed species.  |
| Little Hay Golf Course (65/012)                              | 61.01     | 610m N                 | Site comprises ancient woodland (Hanging Wood) and old hedgerows on its boundaries with unimproved grasslands. Site supports a range of plant and invertebrate interests.   |
| Hay wood (65/021)  | 7.80      | 740 NE                 | A broad-leaved woodland and mixed plantation, site consists of two parts: Upper and Lower Hay Wood connected joined by a short 'neck' of woodland. The plantation is on an ancient woodland site and has 23 ancient woodland indicator species (AWIs). Upper Hay Wood has some evidence of old bank and ditch features. |

The Site is located to the east of Bovingdon Village and is surrounded by arable and/ or pasture land to the east, south and west. An area of ancient semi-natural woodland is present between the main house and the southern area of grassland. In the wider landscape, the land use is dominated by arable land, with scattered blocks of woodland present with good hedgerow connectivity. Little Hay Golf Complex is located to the north.

The Site does not fall into any Important Plant Areas (IPAs) or Important Invertebrate Areas (IIAs).

#### 4.2. UK Habitat Classification

The site has been split into a red line boundary and blue line boundary; with the red line boundary containing the area where the development has taken place, and the blue line boundary containing existing grazed grassland that has remained unchanged. The red line boundary was found to comprise of Arrhenatherum neutral grassland with some bramble scrub, a pond and mature lines of trees on the north-eastern and south-eastern boundaries. The blue line boundary consists of modified grassland used as grazing land and three scattered trees. 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.

## Red line boundary

### *Arrhenatherum neutral grassland (g3c5)*

The grassland is predominantly of long sward, however there are areas that are shorter that have been modified by the Site works. The dominant species is false oat-grass *Arrhenatherum elatius* with flowering species such as common ragwort *Senecio jacobaea*, thistle *Cirsium sp.* and a small patch of bird's-foot trefoil *Lotus corniculatus* (Photograph 1, 34). Some tree saplings had been planted within the grassland.

### *Bramble scrub (h3d)*

An area of bramble scrub is present within the grassland at the Site.

### *Eutrophic standing water (pond) (r1a)*

A new pond is present at the Site, it is approximately 400m<sup>2</sup> in size and constructed with a plastic liner. At the time of the survey, the pond had limited aquatic vegetation present (Photograph 2-3, 34). The pond is connected to a rainwater collection system and is fed by rainwater. This system has been installed to reduce the level of nutrients which may otherwise exacerbate the growth of algae.

### *Structure (u1b5)*

A new shelter has been hand-built using wooden beams, with a new retaining wall constructed at its rear. It has a loosely thatched roof with a skylight which allows rainwater to run-off and be collected in a tank (Photograph 4, 34).

The spoil created from the creation of the new pond and shelter has been used to create a spiral bund to the west of the field. This has been colonised by early successional herb species such as dock *Rumex sp.* and common ragwort.

## Blue line boundary

### *Modified grassland (g4)*

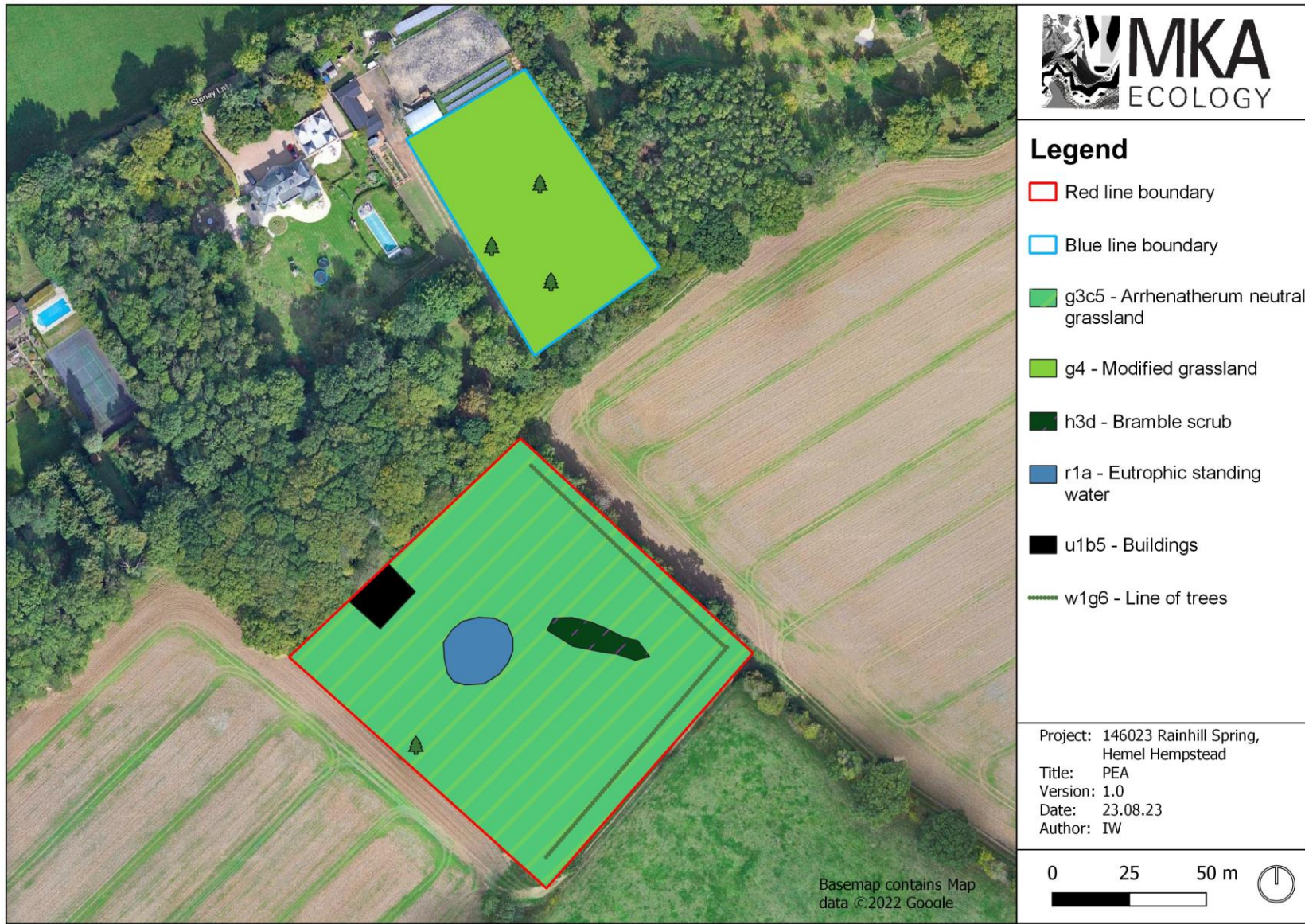
The area is comprised of modified grassland used for grazing a small number of animals. It is grass dominated, largely perennial rye-grass *Lolium perenne*, with a few flowering species. A small number of scattered trees are present comprising silver birch *Betula pendula* and *Prunus* species (Photograph 5, 34).

Secondary codes:

- 11 – scattered trees



Figure 1: UK Habitat Classification map of Rainhill Spring, Hemel Hempstead



### 4.3. Protected species scoping survey

The following scoping assessment determines the likelihood of occurrence of any legally protected or notable species at the Site.

#### *Plants and fungi*

The data search returned some records of protected and notable plant species including bluebell, Deptford pink, cornflower *Centaurea cyanus*, frog orchid and white helleborine.

No plant species recorded on Site are of conservation concern, or listed on Schedule 8 of the Wildlife and Countryside Act 1981. The species onsite are relatively common and widespread within the wider landscape. No protected or notable species were identified onsite, with the survey being conducted at an appropriate time of year to assess this. As such these habitats are unlikely to support notable or protected plant species and their likelihood of presence onsite is **negligible**.

#### *Invertebrates*

The data search returned no records of protected invertebrates. Numerous records of notable species were returned by the data search such as sallow *Cirrhia icteritia*, small blue *Cupido minimus* and small heath *Coenonympha pamphilus*. No notable or protected species were observed during the field visit.

The habitats onsite are common within the wider landscape provide are likely to provide limited resources for a number of common and widespread invertebrates. The Site is considered to lack the flora diversity to support significant numbers of protected or notable invertebrate species. Overall, the Site holds **negligible** risk of protected invertebrate species, or notable invertebrate assemblages, being present.

#### *Fish*

A very small number of European eel records were returned by the data search, however, the exact location of these records were not enclosed. Pre-existing information of the Site prior to the construction of the pond is limited, however, the applicant has stated that the pond did not hold water for significant periods of time across the year. During the field visit, no fish were observed within the new pond, and no other suitable habitats to support fish are present. Overall, the Site holds **negligible** risk of protected or notable fish species being present.

#### *Amphibians*

The data search returned a small number of great crested newt (GCN), the closest located 1.9km to the south west, and common toad records. A search of Defra's MAGIC website returned no records of European Protected Species Licences granted for GCN, however, GCN survey data returns from 2016 were present located approximately 2km to the south west. Ordnance survey maps and aerial

photography were consulted for the presence of suitable waterbodies for amphibians within 500m of the Site boundary and no ponds were identified.

The habitats onsite and within the near surrounds provide opportunities for foraging, commuting and sheltering. The woodland and hedgerows located adjacent to the Site also provide excellent connectivity to the wider landscape. Whilst the old onsite pond may have provided suitable breeding habitat for GCN, no further waterbodies have been identified within 250m of the Site. It is therefore considered likely that the old onsite pond would have been isolated and provided very limited value for GCN, and the likelihood of GCN present within the Site is therefore considered **negligible**. There is **moderate** potential for the Site to support other amphibian species present within the local area.

#### Reptiles

A very small number of common lizard records were returned by the data search. However, there is suitable habitat present on the Site, including the grassland, scrub and pond, which provide opportunities for foraging and basking. The woodland and hedgerows located adjacent to the Site provide excellent connectivity to the wider landscape. There is **moderate** potential for the Site to support reptiles.

#### Birds

Seven species were recorded during the site visit. These species are shown in Table 6 together with their conservation status. It is important to note that this is not a full inventory of species for the site.

**Table 6: Bird species recorded during site visit at Rainhill Spring, Hemel Hempstead**

| Common name              | Systematic name                | S1<br>W&CA <sup>1</sup> | BoCC <sup>2</sup><br>Status | S41 SPI <sup>3</sup> | Local<br>PrSp <sup>4</sup> |
|--------------------------|--------------------------------|-------------------------|-----------------------------|----------------------|----------------------------|
| Buzzard                  | <i>Buteo buteo</i>             |                         | Green                       |                      |                            |
| Great spotted woodpecker | <i>Dendrocopos major</i>       |                         | Green                       |                      |                            |
| Blue tit                 | <i>Cyanistes caeruleus</i>     |                         | Green                       |                      |                            |
| Great tit                | <i>Parus major</i>             |                         | Green                       |                      |                            |
| Wren                     | <i>Troglodytes troglodytes</i> |                         | Amber                       |                      |                            |
| Blackbird                | <i>Turdus merula</i>           |                         | Green                       |                      |                            |
| Robin                    | <i>Erithacus rubecula</i>      |                         | Green                       |                      |                            |

<sup>1</sup> Schedule 1 of The Wildlife and Countryside Act 1981 (see Appendix 1)

<sup>2</sup> Birds of Conservation Concern (see Appendix 1)

<sup>3</sup> Section 41 (NERC Act 2006) 'Species of Principal Importance' (see Appendix 1)

<sup>4</sup> Local Priority Species

A large number of bird records were returned by the data search including species listed on the Schedule 1 of the Wildlife and Countryside Act (1981) such as barn owl *Tyto alba*, fieldfare *Turdus pilaris*, Firecrest *Regulus ignicapilla* and red kite *Milvus milvus*. Birds of prey, such as barn owl *Tyto alba*, red kite *Milvus milvus* may occasionally hunt over the arable fields surrounding the Site but are unlikely to utilise the Site itself for breeding. The Site is more likely used by common passerine species such as those identified during the survey.

The trees and scrub offer suitable nesting habitat for birds and overall, there is a **high** likelihood that habitats onsite are used by birds for breeding.

#### *Bats*

The data search produced several records of six bat species, including Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared *Plecotus auritus*. A search of Defra's MAGIC website returned seven European Protected Species Licences granted for bats within 2km of the Site. The closest being for the destruction of a common pipistrelle roost, located 320m to the north east.

During the field survey, no bats or evidence of bats were seen, and the trees on Site has **negligible** potential to support roosting bats. The open structure of the shelter, offers potential to a small number of bats that may utilise the beams as opportunistic roosts during the active season. However, the structure would not offer stable conditions suitable for hibernation. Overall, the new structure has **low** potential for roosting bats.

The grassland, scrub, pond and line of trees are likely to support foraging and commuting bats within the Site and wider area. However, due to the current lack of aquatic vegetation within the pond and the limited flora present within grassland habitats present, the Site is considered to provide limited opportunities for foraging. In the wider surrounds, arable and/or pasture land dominates the landscape with excellent woodland and hedgerow connectivity for commuting bats. Overall, the Site has **low** potential to support foraging and commuting bats.

#### *Badgers*

Numerous records of badger were returned by the data search. No evidence of badger was recorded during the field visit, however, the habitats on Site are suitable to support foraging and commuting habitat. The woodland adjacent to the Site also offers suitable opportunities for sett building. Overall, the likelihood of badgers being present within the area is **moderate**.

#### *Other mammals*

The data search returned some records of hedgehog and the habitats on Site i.e., grassland, scrub treeline and adjacent woodland edge offer suitable foraging and sheltering opportunities for this species. The likelihood of hedgehog being present is **moderate**.

## 5. ECOLOGICAL CONSTRAINTS, OPPORTUNITIES AND RECOMMENDATIONS

This section outlines key ecological issues for consideration, recommendations for further work and ecological enhancements where appropriate. As the PEA has been undertaken retrospectively to the works, it is not possible to fully determine what protected species may have been present prior to the works being undertaken and any likely impacts as no baseline survey was undertaken. However, based on the protected species scoping survey, it is considered likely that impacts to habitats and potential species which may be present would have been limited due to the size and nature of the works.

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 conservation interests. No further works are anticipated to take place at the Site and there is significant potential for enhancing the biodiversity of the Site.

### *On-site habitats*

The construction of the new pond and shelter have been completed. These features would have resulted in the loss of some grassland and the old pond, however, with the construction of the new pond, there is no loss of this habitat type from the Site. No further works are anticipated.

Ponds are excellent resources for biodiversity and it is recommended that enhancements to the pond are undertaken to improve the botanical features, which will subsequently support a wide range of species such as amphibians, reptiles, birds, mammals and invertebrates. This should include a mixture of emergent, floating and submerged plants (of local provenance) with some areas of open water. Following discussions with the applicant, planting will take place to improve the botanical features within the pond. A list of species is provided in Appendix 4. Planting should take place during the optimal season, early spring to summer, to ensure plants have sufficient time to establish. The pond should be managed so that it possesses <10% cover of duckweed or filamentous algae.

There is potential to increase the species richness and biodiversity of the existing grassland, considering seeding as well as management, which would assist in improving its condition. Additional tree planting would also assist in increasing the biodiversity of the Site.

### **Recommendation 1**

Enhance pond with botanical planting to improve the overall biodiversity value of the Site. Consider enhancing existing grassland and additional tree planting. It is recommended that native British species are incorporated within any of the planting schemes.

Management of the grassland would improve the quality and biodiversity value it holds. The applicant intends to graze the southern field. It is important that if the grassland is grazed by animals, that a suitable grazing regime is developed to prevent overgrazing and ensure habitats continue to provide beneficial opportunities for species discussed within this report. The applicant will utilise a field rotation regime, whereby, animals will graze partially in the eastern field, adjacent to the main house, and in the southern field. Animal movements will be controlled by the use of mobile electric fencing, to prevent damage or degradation of the new pond.

Other management considerations include but are not be limited to:

- Rotation of management to ensure structural diversity across the Site;
- The inclusion of short duration grazing methodology in areas of the fields and allowing rest periods to manage the grassland for biodiversity;
- Time of years i.e. late summer and autumn to allow the plant species to flower and set seed;
- Maintaining a low grazing intensity; and
- Ensure features of biodiversity interest are protected from damage or degradation.

#### *Amphibians*

The grassland, scrub and pond offer suitable habitat for amphibians such as common toad and frog. Evidence of the previous pond is not available; however, the applicant has stated that the pond did not hold water for significant periods of time across the year and it is likely that this feature had limited value for amphibians. No further works are anticipated and no impacts to this species are expected.

Enhancements to the pond will greatly benefit amphibian species. Further enhancements such as the creation of a deadwood features at the Site or hibernacula, would also provide good hibernation and refuge opportunities. This would also provide valuable foraging resources for invertebrates, which in turn would benefit a range of other species such as hedgehogs and reptiles.

The spoil bund arising from the new pond and shelter creation also provides an excellent feature and can also provide good refuge or hibernation habitat. This should be left uncompacted, and allowed to establish with vegetation.

#### **Recommendation 2**

Retain existing soil heap and allow to become vegetated naturally. Consider the addition of deadwood features or hibernacula to provide additional sheltering habitat for amphibians.

#### *Reptiles*

Suitable habitat is present in the form of grassland, scrub and pond and is likely to provide a matrix of habitat suitable for foraging, basking and hibernating opportunities. No further works are anticipated and no impacts to this species group are expected.

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).

Recommendation 1 and 2 outlined above will also greatly benefit this species group, providing suitable sheltering habitat for reptiles and additional opportunities for foraging. No further recommendations for reptiles have been made.

### *Birds*

The Site is considered to support common passerine species such as those identified during the survey i.e. great tit, blackbird and robin. No vegetation removal is anticipated.

Enhanced opportunities for breeding birds should be incorporated into the Site. Bird boxes should be mounted on trees, fences and/ or built structures at the Site. It is recommended that there is a focus on the provision of generalist bird boxes and the provision of a barn owl box. Examples of suitable boxes are shown in Appendix 5 together with information concerning the correct siting of these enhancement features.

#### **Recommendation 12**

Install two bird boxes on suitable trees, fences or built structures, to support generalist species and one barn owl box.

### *Bats*

The wider landscape has the potential for use by foraging bats. No impacts to foraging bats are anticipated and there will be no new lighting which may cause disturbance. With this in mind, enhanced opportunities for roosting bats should also be provided at the site through installation of bat boxes. Examples of suitable boxes are shown in Appendix 5 together with information concerning the correct siting of these enhancement features.

#### **Recommendation 9**

Install two bat boxes mounted on suitable trees or on built structures at the Site.

### *Other mammals*

Habitats on Site have the potential to support hedgehog. Retaining areas of leaf litter, the onsite scrub and incorporating deadwood features or log piles will provide shelter for hedgehog. Enhancements to the new pond will also benefit this species.



Summary of recommendations

Table 7 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 7: Summary of recommendations at Rainhill Spring**

| Species    | Pre-planning action required? | Pre-construction action required? | Construction phase mitigation required? | Enhancements proposed?              |
|------------|-------------------------------|-----------------------------------|---|-------------------------------------|
| Habitats   | No                            | No                                | No                                      | Planting of pond (native planting)  |
| Amphibians | No                            | No                                | No                                      | Planting of pond, deadwood features |
| Reptiles   | No                            | No                                | No                                      | Deadwood features                   |
| Bats       | No                            | No                                | No                                      | Bat boxes                           |
| Birds      | No                            | No                                | No                                      | Bird boxes and native planting      |

## 6. CONCLUSIONS

A Preliminary Ecological Appraisal was undertaken at Rainhill Spring, Hemel Hempstead in July 2023 to support a retrospective planning application. As works had been completed prior to the site survey, it is not possible to ascertain what species may have been present. The appraisal assessed the current ecological value of habitats within the Site and their potential to support protected and notable species. Based on the protected species scoping survey, it is considered likely that impacts to habitats and potential species which may be present would have been limited due to the extent and nature of the works.

No further surveys are recommended, however, enhancements to improve the Site's overall biodiversity value have been included as advice and guidance. This includes native planting and enhancement of the newly created pond, the creation of deadwood features on Site, and the management of grazing animals to balance the requirements of the Site's biodiversity value and important ecological features. These enhancements are directly in line with NPPF policies on biodiversity and habitat conservation.

## 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<br><i>Triturus cristatus</i><br><br>Natterjack toad<br><i>Epidalea calamita</i>   | Schedule 2 of Conservation of Habitats and Species Regulations (2017)<br><br>Schedule 5 of The Wildlife and Countryside Act 1981 (as amended) | <ul style="list-style-type: none"> <li>Deliberately capture or kill, or intentionally injure;</li> <li>Deliberately disturb or recklessly disturb them in a place used for shelter or protection;</li> <li>Damage or destroy a breeding site or resting place;</li> <li>Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection; and</li> <li>Possess an individual, or any part of it, unless acquired lawfully.</li> </ul> |
| <i>Reptiles</i>  |   |   |
| Common lizard<br><i>Zootoca vivipara</i><br><br>Adder <i>Vipera berus</i><br><br>Slow-worm <i>Anguis fragilis</i><br><br>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"> <li>Intentionally kill or injure individuals of these species (Section 9(1)).</li> </ul>   |

| Subject   | Legislation (England)  | Relevant prohibited actions   |
|---|--|---|
| <p>Sand lizard <i>Lacerta agilis</i></p> <p>Smooth snake<br/><i>Coronella austriaca</i></p> | <p>Full protection under Section 9 of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)</p> | <ul style="list-style-type: none"> <li>• Deliberately or intentionally kill, capture (take) or intentionally injure;</li> <li>• Deliberately disturb;</li> <li>• Deliberately take or destroy eggs;</li> <li>• Damage or destroy a breeding site or resting place or intentionally damage a place used for shelter; or</li> <li>• Intentionally obstruct access to a place used for shelter.</li> </ul> |
| <i>Birds</i>  |  |   |
| <p>All wild birds</p>   | <p>Wildlife and Countryside Act 1981 (as amended)</p>  | <ul style="list-style-type: none"> <li>• Intentionally kill, injure, or take any wild bird or their eggs or nests.</li> </ul>   |
| <p>'Schedule 1' birds</p>   | <p>Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)</p>                                    | <ul style="list-style-type: none"> <li>• 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</li> <li>• Disturb the dependent young of any wild bird listed on Schedule 1.</li> </ul>   |
| <i>Mammals</i>  |  |   |
| <p>Bats (all UK species)</p>  | <p>Schedule 2 of Conservation of Habitats and Species Regulations (2017)</p>                               | <ul style="list-style-type: none"> <li>• Deliberately capture, injure or kill a bat;</li> <li>• 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</li> </ul>                |

| 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"> <li>• Damage or destroy a bat roost;</li> <li>• Intentionally or recklessly disturb a bat at a roost; or</li> <li>• Intentionally or recklessly obstruct access to a roost.</li> </ul> <p>In this interpretation, a bat roost is "<i>any structure or place which any wild [bat]...uses for shelter or protection</i>". 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"> <li>• Damage a sett or any part of it;</li> <li>• Destroy a sett;</li> <li>• Obstruct access to, or any entrance of, a sett; or</li> <li>• Disturb a badger when it is occupying a sett.</li> </ul> <p>A sett is defined legally as any structure or place which displays signs indicating current use by a badger (Natural England 2007).</p>   |

### The Environment Act 2021

The Environment Act 2021, sets out key legislation after the UK's exit from the European Union. With the largest changes to green regulations in decades, the Act includes the establishment of an Office for Environmental Protection, targets on air pollution, water quality and biodiversity, and the enshrinement of the 25 Year Environment Plan in law. The Act also makes provisions for a mandatory 10% net gain in biodiversity for all developments covered by the Town and Country Planning Act and it also introduces a statutory requirement for Local Nature Recovery Strategies.

Full legislation text available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

### The Conservation of Habitats and Species Regulations 2017 (as amended)

Full legislation text available at: [The Conservation of Habitats and Species Regulations 2017 \(as amended\) \(legislation.gov.uk\)](#)

#### **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 245 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 70 species on the Red list, 103 on the Amber list and 72 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”.

## 8.2. 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.

### Red line boundary

#### *Arrhenatherum neutral grassland – g3c5*

| Common Name              | Systematic Name              | Relative abundance |
|--------------------------|------------------------------|--------------------|
| False oat-grass          | <i>Arrhenatherum elatius</i> | D                  |
| Ragwort                  | <i>Senecio jacobaea</i>      | F                  |
| Spear thistle            | <i>Cirsium vulgare</i>       | F                  |
| Dove's-foot crane's-bill | <i>Geranium molle</i>        | O                  |
| Bird's-foot trefoil      | <i>Lotus corniculatus</i>    | R                  |

#### *Bramble scrub (h3d)*

| Common Name   | Systematic Name              | Relative abundance |
|---------------|------------------------------|--------------------|
| Bramble       | <i>Rubus fruticosus agg.</i> | D                  |
| Common nettle | <i>Urtica dioica</i>         | O                  |

### Blue line boundary

#### *Modified grassland (g4) – scattered trees (11)*

| Common Name         | Systematic Name            | Relative abundance |
|---------------------|----------------------------|--------------------|
| Perennial rye-grass | <i>Lolium perenne</i>      | D                  |
| Ribwort plantain    | <i>Plantago lanceolata</i> | O                  |
| Common daisy        | <i>Bellis perennis</i>     | R                  |
| Silver birch        | <i>Betula pendula</i>      | O                  |
| Cherry sp.          | <i>Prunus sp.</i>          | O                  |

### 8.3. Appendix 3: Site photographs

**Photograph 1: Arrhenatherum neutral grassland**



**Photograph 2: Pond**



**Photograph 3: Pond**



**Photograph 4: Structure**



**Photograph 5: Modified grassland**



#### 8.4. Appendix 4: Proposed pond planting list

| Common Name           | Systematic Name                 |
|-----------------------|---------------------------------|
| Lesser water plantain | <i>Baldellia ranunculoides</i>  |
| Bogbean               | <i>Menyanthes trifoliata</i>    |
| Slender tufted sedge  | <i>Carex acuta</i>              |
| Common cotton grass   | <i>Eriophorum angustifolium</i> |
| Greater pond sedge    | <i>Carex riparia</i>            |
| Hair grass            | <i>Deschampsia sp.</i>          |
| Lesser spearwort      | <i>Ranunculus flammula</i>      |
| Pepper grass          | <i>Pilularia globulifera</i>    |
| Corkscrew rush        | <i>Juncus effusus</i>           |
| Hard rush             | <i>Juncus inflexus</i>          |
| Marsh marigold        | <i>Caltha palustris</i>         |
| Soft rush             | <i>Juncus effusus</i>           |
| Bog arum              | <i>Calla palustris</i>          |
| Mare's tail           | <i>Hippuris sp.</i>             |
| Pendulous sedge       | <i>Carex pendula</i>            |

| Common Name          | Systematic Name                |
|----------------------|--------------------------------|
| Purple loosestrife   | <i>Lythrum salicaria</i>       |
| Spearmint            | <i>Mentha spicata</i>          |
| Sweet galingale      | <i>Cyperus longus</i>          |
| Bulrush              | <i>Typha minima</i>            |
| Water forget-me-not  | <i>Myosotis scorpioides</i>    |
| Water mint           | <i>Mentha aquatica</i>         |
| Water soldier        | <i>Stratiotes aloides</i>      |
| Water violet         | <i>Hottonia palustris</i>      |
| White marsh marigold | <i>Caltha leptosepala</i>      |
| Yellow loosestrife   | <i>Lysimachia vulgaris</i>     |
| Arrowhead native     | <i>Sagittaria sagittifolia</i> |
| Brooklime            | <i>Veronica beccabunga</i>     |
| Common spike rush    | <i>Eleocharis palustris</i>    |
| Cyperus sedge        | <i>Carex pseudocyperus</i>     |
| True bulrush         | <i>Scirpus lacustris</i>       |
| Slender reed mace    | <i>Typha laxmanii</i>          |

| Common Name    | Systematic Name             |
|----------------|-----------------------------|
| Water crowfoot | <i>Ranunculus aquatilis</i> |



## 8.5. Appendix 5: Bird and bat box recommendations

### **Bird box recommendations**

A large number of bird boxes are available, designed for the specific needs of individual species. These are normally either designed to be mounted onto trees, external walls or integrated into a building. In general, bird boxes should be mounted out of direct sunlight and prevailing winds, out of reach of predators, with suitable foraging habitat for the subject species close by. Bird boxes should also be left up over winter as they can provide useful roosting sites for birds in bad weather.


Nest boxes should be cleaned at the end of each bird breeding season. All nesting material and other debris should be removed from the box. It should then be scrubbed clean with boiling water to kill any parasites (avoid using any chemicals). Once the box is clean, it should be left to dry out thoroughly. Under the Wildlife and Countryside Act 1981 it is an offence to disturb breeding birds and therefore annual cleaning is best undertaken from October to January when there is no risk of disturbing breeding birds.

#### Generalist boxes

Boxes to attract garden birds and woodland breeding species such as tits, nuthatch, redstart and pied flycatcher can be placed in gardens, orchards, woodlands and a wide variety of other habitats. The species of birds attracted to the box will depend upon the size of the entrance hole (see table below).

Boxes should be fixed two to five metres up a tree or wall, out of the reach of predators such as domestic cats. Unless there are trees or buildings, which give permanent shelter, it is best facing between north and east.

| General       |  |  |
|---------------|--|--|
| Entrance Hole | Species  |  |
| 28mm          | Blue-, Marsh-, Coal- and Crested Tit, Wren.  |  |
| 34mm          | Great-, Blue-, Marsh-, Coal- and Crested Tit, Nuthatch, Pied Flycatcher, House Sparrow |  |
| 40mm          | Redstart and Black Redstart  |  |
| 50m           | Starling   |  |
| 60m           | Spotted Flycatcher   |  |

|  |  |  |
|--|--|--|
| <p>Schwegler No. 1B General Purpose Nest box</p> | <p><a href="http://www.schwegler-nature.com">www.schwegler-nature.com</a></p> <p>Suitable for various garden and woodland birds, created with different sized entrance holes to avoid competition between species. Other variations (e.g. 2M) can be free hanging, to deter predators.</p> |  |
| <p><b>Entrance Hole</b></p>                      | <p><b>Species</b></p>  |  |
| <p>26 mm</p>                                     | <p>Blue-, Marsh-, Coal- and Crested Tit, possibly Wren. All other species are prevented from using the nest box due to this smaller entrance hole</p>  |  |
| <p>32 mm</p>                                     | <p>Great-, Blue-, Marsh-, Coal- and Crested Tit, Redstart, Nuthatch, Pied Flycatcher, Tree and House Sparrows.</p>   |  |
| <p>Oval</p>                                      | <p>Redstart; also used by species that nest in the diameter 32 mm boxes. However, because more light enters the brood chamber, it is preferred by Redstarts.</p>   |  |

Robin/flycatcher boxes

Nest boxes that aim to attract robins and flycatchers should be open-fronted and placed in a hidden location, such as within a climber or other vegetation. The box design can be attached to the outside of a building or mature tree, or incorporated into a building. It is best placed between 1.5m and 3m high.

| <p>Robin/flycatcher</p>                             |  |  |
|---|--|--|
| <p>Example</p>                                      | <p>Description</p>   | <p>Picture</p>   |
| <p>Vivara Pro Barcelona WoodStone Open Nest Box</p> | <p><a href="http://www.nhbs.com">www.nhbs.com</a></p> <p>This nest box is made mix of concrete and FSC certified wood fibres and is suitable for wrens, robins, spotted flycatchers, pied and grey wagtails, song thrushes and blackbirds.</p> |  |

|  |   |  |
|--|---|--|
|  | The best height for this nest box is between 1.5m and 3m high and sited in undergrowth such as ivy. |  |
|--|---|--|



Starling boxes

Starlings are often found in areas where there are established pasture fields close to their roosting site, with further foraging provided by hedges close by.

The nest box should be placed at soffit/eaves level, or at a similar height on a tree, and should not be situated closer than 3m to the ground. Although Starlings do not defend a territory, boxes should be spaced at least several metres apart.

The ideal nest box for starlings is approximately 400mm (h) x 180mm (w) x 180mm (d) with a hole approximately 45mm in diameter.



| Starling                |   |   |
|-------------------------|---|---|
| Example                 | Example   | Example   |
| Woodstone starling nest | <a href="https://www.birdfood.co.uk/woodstone-starling-nest-box.html">https://www.birdfood.co.uk/woodstone-starling-nest-box.html</a><br><br>May also be attractive to woodpeckers but only as a roost site |  |

|   |  |  |
|---|--|--|
| <p>Schwegler Starling box 3S</p>                              | <p><a href="http://www.schwegler-nature.com">www.schwegler-nature.com</a></p> <p>Can be mounted on buildings or trees, ideally out of direct sunlight.</p>   |   |
| <p>3SV Schwegler Nest Box with Predator Protection – 45mm</p> | <p><a href="https://www.nhbs.com/3sv-schwegler-nest-box-with-predator-protection">https://www.nhbs.com/3sv-schwegler-nest-box-with-predator-protection</a></p> <p>With a large, 45mm, entrance hole, this nest box is ideally suited to support starlings and can be mounted on buildings or trees.</p> <p>This box is made from a wood-concrete mix and has a removable front panel that aids cleaning.</p> |  |

### Barn owl boxes

Barn owls hunt over open fields, mainly lowland farmland, with the best foraging habitats being rough tussocky grassland, with a high population of field voles.



Barn owl boxes are available for attachment to houses or trees. The access point of the nest box should face the open countryside. Installing two boxes a few hundred yards apart from each other will accommodate the male during the breeding season.


| Barn owl          |  |  |
|-------------------|--|--|
| Example           | Description  | Picture  |
| Barn owl nest box | <p><a href="http://www.barnowltrust.org.uk">www.barnowltrust.org.uk</a></p> <p>The best place for an owl box is within a large building at 3 metres or higher. Otherwise, erecting an owl box on a tree is suitable.</p>   |    |
| Barn owl nest box | <p><a href="https://www.birdfood.co.uk/barn-owl-nest-box.html">https://www.birdfood.co.uk/barn-owl-nest-box.html</a></p> <p>This box should be installed on a tree in open farmland, an isolated hedgerow or woodland edge ensuring that the entrance hole is clearly visible.</p> |   |
| Barn owl nest box | <p><a href="https://www.nhbs.com/barn-owl-nest-box">https://www.nhbs.com/barn-owl-nest-box</a></p> <p>This box is constructed from exterior grade plywood making it suitable for use both inside buildings, such as barns, or outside.</p>   |  |

**Bat box recommendations**

A wide range of bat boxes are available to suit a variety of species and design requirements. Bat boxes can be mounted externally on buildings, built directly into the wall structure or mounted on trees (dependent on box design).

Boxes are more likely to be inhabited if they are located where bats feed and it may help to place the box close to features such as tree lines or hedgerows, which bats are known to use for navigation and can provide immediate cover for bats leaving the roost. Boxes should be placed in areas sheltered from strong winds and are exposed to the sun for part of the day. Access to any bat roosting features should not be lit and should also be at a reasonable height to avoid predation (at least 2m if possible, preferably 4-5m).

| Example  | Description   | Picture   |
|--|---|---|
| Schwegler General Purpose Bat Box 2F                         | <p><a href="http://www.schwegler-nature.com">www.schwegler-nature.com</a></p> <p>Height: 33 cm<br/>Weight: approx. 3.8 kg<br/>External diameter: 16 cm<br/>Installation: Hanging</p> <p>A general purpose box, suitable for all species.</p>  |   |
| Schwegler General Purpose Bat Box 2F with Double Front Panel | <p><a href="http://www.schwegler-nature.com">www.schwegler-nature.com</a></p> <p>Height 33 cm<br/>Weight: approx. 4.1 kg<br/>External diameter: 16 cm<br/>Installation: Hanging</p> <p>This box is suitable for crevice dwellers, such as Nathusius' pipistrelle, Daubenton's bat and common pipistrelle.</p> |  |

| Example       | Description  | Picture   |
|---------------|--|---|
| Schwegler 1FF | <p><a href="http://www.schwegler-nature.com">www.schwegler-nature.com</a></p> <p>Dimensions: 14(d) x 27(w) x 43(h) cm<br/>Weight: 9.9 kg<br/>Installation: Hanging</p> <p>This box is suitable for crevice dwellers, such as Nathusius' pipistrelle, Daubenton's bat and common pipistrelle.</p> <p>This box minimises temperature fluctuations in spring and autumn and is self-cleaning.</p> |  A black, rectangular bat box with a white entrance hole at the bottom, hanging from a tree trunk by a metal wire. The box has a textured surface and a small metal latch on the side. |



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