ECOLOGICAL IMPACT ASSESSMENT

Moat Farm,
Stoke Mandeville,
Buckinghamshire

Final Report
16th April 2021

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QUALITY ASSURANCE

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The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Every reasonable attempt has been made to comply with BS42020 (Biodiversity: Code of practice for planning and development); the CIEEM Guidelines for Ecological Report Writing (CIEEM, 2017); and the CIEEM Guidelines for Ecological Impact Assessment 2018. If compliance has not been achieved, justification/explanation has been given.

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SUMMARY

- A Preliminary Ecological Appraisal, comprising a Phase 1 Habitat Survey and a protected/priority species assessment, was carried out at an area of land at Moat Farm, Stoke Mandeville, Buckinghamshire in March 2021. The survey and assessments were required in connection with the proposed erection of a new office building.

- The purpose of this report is to identify all important ecological features that could be impacted by the development; to identify the need for further surveys and whether any protected species mitigation licence applications may be required; identify likely significant ecological effects of future development; and to outline mitigation, enhancement and compensation requirements.

- The site comprises a small field of unmanaged grassland adjacent to a stream, with scattered trees, scrub and bankside (mostly tall ruderal) vegetation. Post and wire fencing marks the southern and eastern boundaries, the northern boundary is the stream, and there is no formal boundary between the site and adjacent parking area/farmyard to the west. The most important habitat on site is the stream; mitigation measures are required to protect this feature. All trees and scrub will be retained, and only the species-poor grassland will be directly lost as a result of the development, so this is unlikely to result in significant ecological effects. Recommendations are made to protect retained trees and scrub, and to mitigate/compensate for the low value habitats that will be lost as a result of the proposed works.

- The survey revealed some potential for the site and adjacent habitats to support protected and priority species, including bats, birds, otter, badger, great crested newt, reptiles, hedgehog and polecat, but there are unlikely to be any significant impacts on these species from the proposed works providing appropriate mitigation measures are put in place during development, and in any proposed lighting and landscaping schemes.

- Ecological enhancements will be required to deliver biodiversity net gain as a result of development in line with planning policy. Recommendations are made for including bat and bird boxes and features for wildlife within any new landscaping on site.

- The results of this assessment are valid for up to two years from the date of the survey (March 2021). Should the proposed development be delayed beyond this date, the preliminary survey should be updated; it should also be noted that regulatory authorities may require updated surveys within a shorter timescale than two years.

1 INTRODUCTION

1.1 Background

A Preliminary Ecological Appraisal (PEA) (including a Phase 1 Habitat Survey and protected/priority species assessment) was carried out at an area of land at Moat Farm, Stoke Mandeville in Buckinghamshire on 24th March 2021. The site is located at an approximate central OS grid reference of SP 8276 1036.

The surveys and assessments were required in connection with proposals for the erection of a new office building.

1.2 Personnel

The assessment and reporting were carried out by Catherine Coton ACIEEM of Swift Ecology Ltd. Catherine is employed as a Senior Ecologist with Swift Ecology Ltd and is an experienced habitat surveyor (FISC level 4) and holder of a Natural England survey licences for bats (Class Licence reference 2017-31902-CLS-CLS) and great crested newts (Class Licence reference 2015-18289-CLS-CLS). Catherine has over seven years' experience working as an ecologist and has undertaken numerous preliminary ecological appraisals and surveys for protected species, including bats, reptiles and great crested newt, and has prepared subsequent reports with appropriate recommendations.

1.3 Ecological Context

The site lies on the edge of a farmyard to the west of the village of Stoke Mandeville, and approximately 800 m south of the town of Aylesbury, in Buckinghamshire. The surrounding landscape comprises mainly arable land, with some pasture, and the nearby villages and towns. A network of streams, including one along the northern site boundary, provide connectivity through the wider area. There are networks of hedgerows around the arable fields, which provide some commuting links, although many of these appear to be thin and gappy, resulting in some areas with limited habitat connectivity around expanses of arable land. There are ponds scattered across the surrounding farmland, but otherwise there are few areas of semi-natural habitats, such as semi-improved grassland or woodland, within a 1 km radius of the site.

The site location and surrounding landscape are illustrated in Figure 1.1.

Figure 1.1: Site location (red line boundary) and surrounding landscape.

1.4 Purpose of Report

The purpose of this report is to identify all important ecological features that could be affected by the development; identify, describe and evaluate all the potential impacts associated with the proposed development, and identify likely significant ecological effects of the development.

This report also sets out the mitigation, compensation and enhancement measures required to address significant ecological effects and to ensure compliance with nature conservation legislation and planning policy.

The legal protection and planning policies relevant to the designated sites, species or habitats mentioned in this report are detailed in Appendix 1.

The report format follows the 2018 CIEEM guidance, modified to reflect the small size of the site and the limited impact of the development.

2 METHODS

2.1 Scope of Assessment

The scope of the assessment reflects the relatively small size and the likely limited impacts of the proposed development. The zone of influence is considered to be the habitats within the red line boundary within which the development will occur; its boundary features and immediately adjoining features of biodiversity interest; and the Local Wildlife Sites and other designated sites within a 1 km radius. The important ecological features considered as part of this assessment are designated sites[1], protected/priority habitats and species[2], and legally controlled species[3].

2.2 Background Data Search

A background data search was undertaken in March 2021 by Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) for records of designated sites and protected, priority and legally controlled species within a 1 km radius.

Reference was also made to Natural England's MAGIC website[4] for Site of Special Scientific Interest (SSSI) Impact Risk Zones (IRZ) within the site, and for records of granted protected species licences within a 1 km radius (great crested newt) and 2 km radius (bats).

In addition, reference was made to the HS2 London-West Midlands Environmental Statement Volume 5 Map Book CFA11 Stoke Mandeville and Aylesbury Ecology[5] for records of protected and priority species surveys carried out on the wider Moat Farm site in 2012-2013 to inform HS2. Relevant survey information (relating to bats, water vole and white clawed crayfish) is summarised in Section 3.3.

2.3 Field survey

2.3.1 General

A Preliminary Ecological Appraisal, comprising a Phase 1 Habitat Survey and protected species assessment, was undertaken, following standard methods as described in the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017), and the Phase 1 Habitat Survey Methodology (JNCC, 2010).

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[1] Designated sites are taken to mean statutory sites designated under international conventions or European legislation, statutory sites designated under national legislation, and locally designated sites. Impact zones (e.g. SSSI) are also included.

[2] Protected/priority habitats and species are taken to mean habitats and species of principal importance for the conservation of biodiversity in England, local biodiversity action plan habitats and species, and red-listed, rare and legally protected species, and species endemic to a country or geographic location (as defined within *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

[3] Invasive, non-native animal and plant species that are listed on Schedule 9, Parts I and II respectively, of the Wildlife and Countryside Act 1981, and EU Regulation 1143/2014 on Invasive Alien Species.

[4] https://magic.defra.gov.uk/MagicMap.aspx

[5] https://webarchive.nationalarchives.gov.uk/20140613013204/http:/assets.dft.gov.uk/hs2-environmental-statement/volume-5/ecology/MB45_VOL5_EC_CFA11_WATERMARKED.pdf

The surveys were undertaken on 24th March 2021 by Catherine Coton of Swift Ecology Ltd. Weather conditions at the time of the survey are shown in Table 2.1. The survey covered all land within the red line boundary (see Figure 3.1, Section 3). Adjacent habitats were also briefly assessed.

Table 2.1: Survey conditions

Date	Approximate start time	Weather conditions
24.03.21	11 am	12°C, overcast (100 % cloud cover) and windy (Beaufort F3). Good visibility and no rain during the survey.

2.3.2 Phase 1 Habitat Survey

A Phase 1 Habitat Survey typically comprises the following elements, as necessary depending on the nature of the site:

- Habitat descriptions for each separate habitat type;
- Target notes to identify particular areas of interest or concern; and
- Plant species lists, if appropriate. In this case, because of the small survey area and early season in which the survey was carried out, a detailed species list was not compiled.

All information was mapped and recorded as target notes where appropriate (see Figure 3.1 and Table 3.1, Section 3). The locations of all habitat/site boundaries, trees etc. are approximate.

2.3.3 Protected species assessment

The suitability of habitats for protected animal species was assessed at the same time as the Phase 1 Habitat Survey and incidental evidence of such species was recorded if encountered. Species that might be expected to be present in the geographic location include bats, dormouse *Muscardinus avellanarius*, badger *Meles meles*, otter *Lutra lutra*, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes*, great crested newt *Triturus cristatus*, reptiles and nesting birds.

Bats

There are no buildings within the proposed development area. The trees on site were briefly assessed from ground level for their potential to support roosting bats. Habitat was assessed for its bat foraging and commuting potential.

Dormouse

The data search identified no records of this species within the 1 km search radius. The development site supports limited habitat for dormouse, and it is isolated from any large woodlands within the wider area that would provide more suitable habitat. It is considered unlikely that this species will be present on site due to the lack of suitable habitat and poor connectivity. As such it is not considered further in this report.

Otter, water vole and white-clawed crayfish

Habitat on the site was assessed for its suitability to support otter, water vole and white-clawed crayfish. Any incidental signs were recorded if they were encountered. A full survey for these species was not undertaken.

Badger
Habitat was assessed for its suitability for badger foraging and sett digging. Any incidental signs of badgers, such as setts, latrines, foraging signs, or footprints, were recorded if they were encountered. A full badger survey was not undertaken.

Great crested newt
Great crested newts use terrestrial habitat within 500 m of breeding ponds; if used by the species for resting, such habitat is protected. Terrestrial habitats on site were therefore assessed for their potential to support the species, based on factors including vegetation structure and composition, the availability of shelter and foraging resources. The proximity of ponds and intervening habitats are also an important factor in determining the likelihood of this species being present on site.

Reptiles
The suitability of habitats on site for common reptiles (adder *Vipera berus*, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara* and slow-worm *Anguis fragilis*) was assessed, based on factors such as the quality of the foraging resource, the presence of suitable sites for basking, and the presence of refugia for shelter and hibernation. Detailed reptile surveys were not undertaken.

Nesting birds
Habitats on site were assessed for their suitability for breeding birds, including trees, hedgerows and the building. Any incidental sightings, or active/old nests were recorded.

2.3.4 Other priority species

General habitat suitability and incidental sightings of other priority species[6], including species of principal importance for the purpose of conserving biodiversity in England (NERC Act 2006) and Local Biodiversity Action Plan species, were noted. However, the presence of many priority species cannot be confirmed without targeted surveys (e.g. lower plants, insects) and thus the type and quality of habitats present (e.g. freshwater) were used to help assess the likelihood of such species being present. Species particularly considered as part of this assessment were mostly limited to mammals, reptiles, amphibians, birds and more easily visible/identifiable plants and insects likely to be present in the geographical region, and which could potentially occur on the site.

2.3.5 Invasive plant species

During the site visit, the presence of any legally controlled (invasive, non-native) plant species was noted. A detailed survey was not undertaken.

2.3.6 Limitations

March is not an optimal time of year for Phase 1 Habitat Survey because many plants are not in flower and/or leaf and so may not be easily identified. This is not considered to be a significant constraint to this report as the basic phase 1 habitat types can be distinguished at this time of year, and this report constitutes an initial assessment of habitats only, not a detailed botanical study.

[6] Priority species, as defined within Chartered Institute of Ecology and Environmental Management (2017). *Guidelines for Preliminary Ecological Appraisal*. CIEEM, Winchester.

It should be noted that any survey based on a single site visit will miss a significant proportion of the species present on or using the site. As such this report includes an assessment only of the likely presence of protected, priority and invasive species.

3 BASELINE ECOLOGICAL CONDITIONS

3.1 Designated sites

The development site has no designation for nature conservation within its boundary, and BMERC provided no records of statutory or non-statutory designated sites within a 1 km radius.

The development site falls within a Site of Special Scientific Interest (SSSI) Impact Risk Zone for several SSSIs in the local area; the closest SSSIs to the site are:

- Weston Turville Reservoir 3.1 km east of the site. This site is described as an unpolluted freshwater reservoir with reed beds, tall fen and willow carr. It has importance for overwintering wildfowl, as well as notable plants and invertebrates.
- Bacombe and Coombe Hills 3.8 km south-east of the site. This site is designated for its species-rich chalk grassland habitat, with rare plants and invertebrates.
- Ellesborough and Kimble Warrens 3.8 km south of the site, also designated as part of Chilterns Beechwoods Special Area of Conservation (SAC). This site is described as supporting deciduous woodland, chalk grassland and scrub habitats, with importance for its overwintering and breeding bird assemblages, rare plants and invertebrate populations.

3.2 Habitats

3.2.1 General

The site comprises a small field (*c.* 0.08 ha) of unmanaged grassland at the entrance to a farmyard. Post and wire fencing separates it from access roads to the east and south, but there is no formal boundary between the site and adjacent parking area/farmyard to the west. A stream runs along the northern boundary. The habitats on site are illustrated on Figure 3.1.

3.2.2 Poor semi-improved grassland

The field comprises an area of species-poor grassland, dominated by grasses with a few forbs scattered through the sward (Plate 3.1). The land is generally uneven and slopes gradually northwards towards the stream, and there is a steep west-facing bank leading up to the adjacent road and bridge to the east in the north-eastern corner. Species present include frequent cock's foot *Dactylis glomerata*, perennial rye-grass *Lolium perenne*, a fescue *Festuca* sp. and Yorkshire fog *Holcus lanatus*, with occasional cow parsley *Anthriscus sylvestris*, nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, common chickweed *Stellaria media* and dove's-foot crane's-bill *Geranium molle*. Along the edges there are localised patches of lesser celandine *Ficaria verna*, red dead nettle *Lamium purpureum*, white dead nettle *L. album* and ground ivy *Glechoma hederacea*. The grassland appears to be generally unmanaged and is becoming long and tussocky with a thatch layer developing.

To the immediate east of the field there is a narrow strip of road verge, which is separated from the field by post and wire fencing but supports a similar grassland sward (Plate 3.2).

3.2.3 Tall ruderal vegetation

The stream bank is covered by tall ruderal vegetation, with locally dominant nettle with occasional broad-leaved dock *Rumex obtusifolius* and burdock *Arctium* sp. at the very top of the bank, and a

mix of great willowherb *Epilobium hirsutum*, meadowsweet *Filipendula ulmaria*, wild angelica *Angelica sylvestris* and figwort *Scrophularia* sp. along the lower slopes (Plate 3.3).

3.2.4 Scattered trees and scrub

The western end of the stream is lined by trees and scrub on both sides (Plate 3.4). Inside the site there are several mature elder *Sambucus nigra* shrubs at the very top of the bank; on the opposite side (outside the site boundary) are a mature willow *Salix* sp. standard and a dense line of mature cypress *Cupressus* sp. trees.

At the top of the bank of tall ruderal vegetation there is a young tree (shown in Plate 3.3), which appears to be dead or dying; the buds present are indicative of oak *Quercus* sp., but it could not be definitively identified due to its poor condition.

In addition, a single early mature horse chestnut *Aesculus hippocastanum* standard and an ornamental holly *Ilex* sp. shrub are present at the south-eastern corner of the site; this area fenced off from the field and road verge (Plate 3.2).

3.2.5 Stream

The stream along the northern boundary is relatively fast-flowing, from east to west; it appears to be a tributary of the River Thame, connecting to the main river approximately 6.5 km downstream of the site to the north-west. In the stretch of stream along the site, the channel was found to hold approximately 60 cm of water at its deepest point during the survey; its water level is likely to fluctuate across the seasons with changes in rainfall, and there are signs that it has flooded over the northern bank (off-site) in recent months (silt and flattened grassland vegetation). The channel bed is mostly covered by silt, with some patches of shingle present. The banks are shallow sloping along the eastern section (Plate 3.5), becoming steeper towards the western end of the site (Plate 3.6). Aquatic vegetation includes patches of sweet-grass *Glyceria* sp. and fool's watercress *Apium nodiflorum*, with brooklime *Veronica beccabunga*, yellow flag *Iris pseudacorus* and soft rush *Juncus effusus* noted at the edges of the banks. At the western end the stream is shaded by the surrounding scrub and trees, and aquatic vegetation becomes patchier.

To the east, outside the site, the stream appears to continue with shallow banks and patches of scrub vegetation and open sections. To the west the banks are steeper, including some canalised sections, and there are areas with dense tree and scrub cover alongside the car park and buildings in the wider Moat Farm site.

3.2.6 Boundaries

The southern and eastern boundaries comprise post and wire fencing around the field, with a narrow strip of road verge along the eastern edge of the site (described above). To the north the site is bound by the stream; to the west there is no formal boundary between the field and adjacent gravel car parking area.

Plate 3.1: Species-poor grassland field

Plate 3.2: Adjacent road verge and fenced area with early mature horse chestnut and holly

Plate 3.3: Ruderal vegetation along stream bank, with dead tree

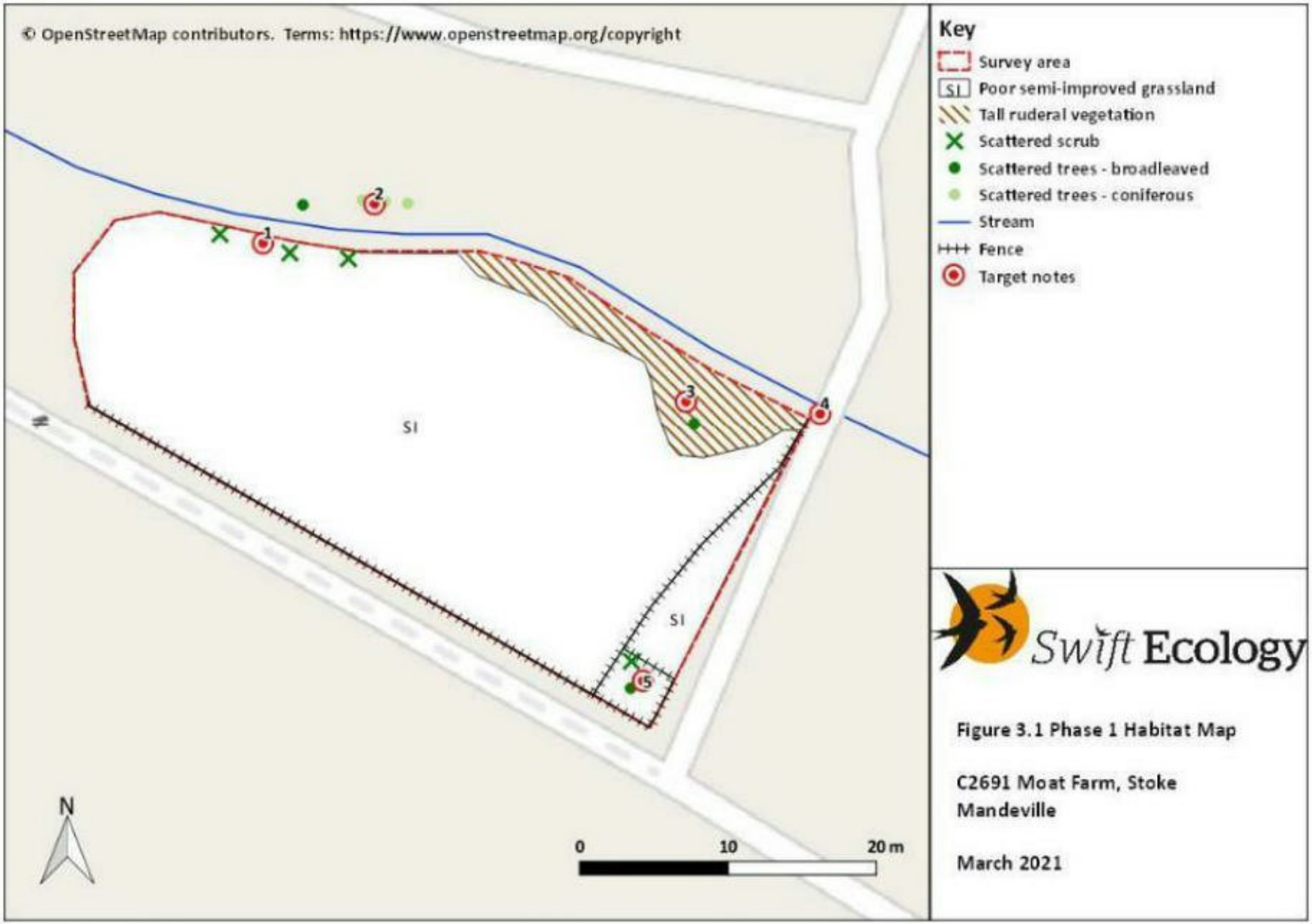
Plate 3.4: Mature elder scrub on southern stream bank, with willow and cypress trees on opposite bank

Plate 3.5: Open section of stream with shallow banks (eastern section)

Plate 3.6: Stream shaded section with steep banks (western section)

Table 3.1: Target notes (all relate to Figure 3.1)

Target note	Description
1	Mature elder scrub along steep southern bank of stream.
2	Mature cypress and willow trees along northern bank of stream.
3	North-facing slope of ruderal vegetation along stream bank, includes a dead/almost dead young tree (possibly an oak).
4	Two otter spraints found on rock under bridge (one recent, one very old). Also numerous small mammal footprints, mostly indicative of rat and mouse/small vole species.
5	Fenced area with early mature horse chestnut standard and ornamental holly shrub, with uncut grass beneath.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Key
Survey area
SI Poor semi-improved grassland
Tall ruderal vegetation
Scattered scrub
Scattered trees - broadleaved
Scattered trees - coniferous
Stream
Fence
Target notes
1
2
3
4
5
SI
SI
N
0
10
20 m
Swift Ecology
Figure 3.1 Phase 1 Habitat Map
C2691 Moat Farm, Stoke Mandeville
March 2021

3.3 Protected and Priority Species

Relevant protected and priority species records within 1 km of the site are given below and a map showing the distribution of records is provided in Appendix 2. None of the records provided relate directly to the study site.

An absence of records does not mean that a species is not present, merely that it has not been recorded. Some species records are not obtainable from the sources utilised and there may be further undetected records for such species on the study site or in the local area.

3.3.1 Bats

BMERC provided 95 records of bats within a 1 km radius of the site, recorded between 1965 and 2015; at least four species have been recorded (soprano pipistrelle *Pipistrellus pygmaeus*, Daubenton's bat *Myotis daubentonii*, brown long-eared bat *Plecotus auritus* and Leisler's bat *Nyctalus leisleri*), as well as indeterminate pipistrelle and *Myotis* species and indeterminate bat species records. No further details were provided and most of the records are recorded to tetrad level only, so the exact locations where they were recorded are unknown.

A search of information held on Natural England's MAGIC Map revealed one instance of a protected species mitigation licence for works impacting bats: a licence enabling the destruction of a resting place (non-breeding) for common pipistrelle *P. pipistrellus* approximately 1.8 km north of the site dated 2009-2011.

The trees and scrub across the site are all early mature (except for the dead young tree) but when observed from ground level none had any apparent features suitable for bat roosting. Bats are therefore unlikely to roost within the site itself; however, nearby buildings and trees on the wider site may well support bat roosts or offer potential features for bat roosting. The HS2 Map Book information suggests that there are confirmed bat roosts for multiple species within the Moat Farm site; the exact details of these are unknown.

The habitats on site are likely to support some invertebrates, and in turn provide a foraging resource for bats, particularly along the stream. The field itself is a very small area of land, so it is unlikely to be an integral part of bat foraging habitat in the local area, nevertheless, the stream and associated bank vegetation offer a potential commuting corridor along the edge of the site with potential importance for bats, especially if there are roosts within buildings on the wider Moat Farm site. Whilst there is no artificial lighting directly on site, there are security lights on the nearby offices and residential buildings, which are likely to result in some light spill onto the site at night.

3.3.2 Otter

BMERC provided no records of otter within the search area, but this wide-ranging species is known to be present in the River Thame catchment, and the stream along the site boundary is a tributary of the Thame, providing direct connectivity between the stretch of stream along the site and the river downstream to the north-west.

Two otter spraints were found under the bridge immediately east of the site during the survey; one appeared recent (Plate 3.7) and the other was very old. This evidence confirms that otters

can access the stream, and suggests they are likely to commute and forage along the stretch past the site. The stream banks alongside the site are generally open, with no significant cover or cavities suitable for otters to lay up or use for breeding holts. Furthermore, the location close to roads and well-used offices, farm and residential buildings will result in high levels of human disturbance, which would likely deter otters from using the site in any significant way.

Plate 3.7: Recent otter spraint on rock under bridge to immediate east of site (Target Note 4)

3.3.3 Water vole

BMERC provided no records of water vole within the search area. Water vole surveys were undertaken by HS2 in 2012-2013 of the stream up and down stream of Moat Farm; these confirmed the likely absence of this species.

The stream and banks do offer some potential opportunities for water vole; however, due to historic declines and lack of records despite known survey effort within the last 7-8 years, it is considered highly unlikely that this species will be present on site and it is not considered further within this report.

3.3.4 Badger

BMERC provided four records of badger within the search area, recorded between 1971 and 2003. These are records of badgers killed on roads; sett locations are unknown.

No evidence of badgers or their setts was found on site or immediately adjacent land that could be viewed from the site boundary. The grassland and stream offer some foraging and commuting opportunities for this species, which is likely to be present in the surrounding area.

3.3.5 Birds

BMERC provided 12 records of 'notable' bird species within the search area, recorded between 1999 and 2008. Records of eight species were provided, namely skylark *Alauda arvensis*, red kite *Milvus milvus*, house sparrow *Passer domesticus*, dunnock *Prunella modularis*, starling *Sturnus vulgaris*, song thrush *Turdus philomelos*, wryneck *Jynx torquilla* and spotted flycatcher *Muscicapa striata*.

Birds seen or heard during the survey (either on site or close by) included goldfinch *Carduelis carduelis*, wren *Troglodytes troglodytes*, house sparrow, skylark, starling, blue tit *Cyanistes caeruleus*, wood pigeon *Columba palumbus* and kingfisher *Alcedo atthis*.

The banks of the stream are too shallow to offer suitable locations for kingfisher nesting, and the field is considered too small, and with high levels of human disturbance from the close proximity to houses and offices, to offer any significant value for ground nesting species, such as skylark. However, the scrub, trees and tall ruderal vegetation all offer a few potential nesting opportunities for a range of birds, and the site offers some foraging value for birds that may nest in the surrounding habitats.

3.3.6 Reptiles

BMERC provided no records of reptile species within the search area, but wide-ranging species such as grass snake, and possibly adder, could be expected to be present locally. The surrounding landscape of arable land offers limited opportunities for species such as common lizard and slow worm, which prefer structurally diverse habitats and do not range as far as grass snake.

The stream along the site boundary offers a potential commuting route and the site offers some potential foraging and basking opportunities for this species. Small mammal (mouse, vole, rat) footprints were noted in the mud along the stream; these species could be utilised as a prey resource for grass snake. However, due to the small size of the site, it is unlikely to be of high value to grass snake, and the grassland sward is generally quite uniform in structure, and in close proximity to houses and offices with associated human disturbance, so it offers suboptimal habitat for other reptiles, such as common lizard and slow worm.

3.3.7 Great crested newt

BMERC provided no records of great crested newt within the search area, and there are no known records of great crested newt mitigation licences, pond surveys or licence returns within a 1 km radius of the site on MAGIC Map. There are no ponds within the site boundary, and the closest mapped standing waterbody is a linear feature, thought to be part of a former fish pond, located approximately 120 m north of the site, which may contain some standing water. The next closest ponds shown on OS maps are located approximately 550 m north-west and 550 m north-east of the site. There was no access to any of these ponds during the survey, so their suitability for great crested newt breeding is unknown, but all are on the far side of the stream, which is likely to act as at least a partial barrier to great crested newt dispersal.

The stream on site offers negligible suitability for great crested newt breeding because it holds fast-flowing water, and likely predators such as fish. The grassland and ruderal vegetation offer some opportunities for foraging; however, the distance from ponds as potential breeding habitat reduces the value of the habitats on site for great crested newt, or other amphibians.

3.3.8 White-clawed crayfish

BMERC provided no records of white clawed crayfish within the search area. The stream along the site boundary is relatively shallow and the channel is mostly lined with soft silt, offering limited habitat suitability for white-clawed crayfish. Due to historic declines and the sub-optimal habitat quality this species is considered highly unlikely to be present along the stream at the site boundary and it is not considered further within this report.

3.3.9 Other priority animals

BMERC provided two records of hedgehog *Erinaceus europaeus* in the search area, dated 2010 and 2015, as well as several records of notable butterfly, moth and beetle species, dated between 1970-2000. The surrounding landscape of farmland, streams and villages is likely to support species such as polecat *Mustela putorius*, harvest mouse *Micromys minutus* and brown hare *Lepus europaeus*.

The grassland is species-poor, so it offers limited value for priority invertebrate species, but the stream and bankside vegetation offer opportunities for such species. The stream is likely to act as a wildlife corridor, offering commuting links for animals such as hedgehog and polecat, so these species may occasionally be present on site.

3.3.10 Priority plants and fungi

BMERC provided 61 records of native black poplar *Populus nigra* subsp. *betulifolia* and one record of bluebell *Hyacinthoides non-scripta* within the search area. Neither of these plants was recorded on site during the survey. The habitats present are widespread and common, with relatively low diversity, so priority plants and fungi are considered unlikely to be present. These species groups are not considered further within this report.

3.4 Invasive Alien (Non-Native) Species

BMERC provided no records of invasive, non-native species within the search area, and no evidence of such species was found on site. However, the survey was carried out early in the growing season, so the potential presence of invasive, non-native plants cannot be completely ruled out.

4 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development comprises the erection of a new single-storey office building with associated car parking area, access and landscaping. There will be a minimum 8 m buffer between the new building and the stream, and all trees and scrub will be retained. The proposed site plan used within this assessment is shown in Figure 4.1.

Figure 4.1: Proposed site plan drawing number PL01 revision A prepared by Grayling Thomas Architects dated 05.08.20.

5 ASSESSMENT OF EFFECTS

5.1 Designated Sites

The site falls within a SSSI Impact Risk Zone for several SSSIs in the area; however, the small-scale development does not fall into any of the categories identified as presenting a risk to the designated sites. No adverse impacts on designated sites are anticipated, and no mitigation or compensation measures are required.

5.2 Habitats

Potential Impacts

The habitats on site are widespread and common, with limited ecological value, except for the stream along the northern site boundary, which is part of an important wildlife corridor through the surrounding landscape.

The stream will be retained as existing, and the development has been designed so that the building is as far as possible from the stream bank, with a minimum 8 m buffer between the built area and the stream. However, in the absence of mitigation there is potential for the stream to be affected by accidental damage to the banks, pollution/sedimentation events and increased lighting, all of which could have an impact on the stream. Measures are therefore required to protect the stream both during construction and during the operational phase of the development to avoid any effects on water quality or stream functionality. The effects on the stream corridor in terms of commuting and foraging value are likely to be minimal because the development affects only a small area of this watercourse; nevertheless, the buffer between the development and the stream must be managed appropriately to ensure it remains suitable for wildlife such as commuting and foraging bats, birds and otter.

Habitats to be directly lost as a result of the development are the species-poor grassland and probably a small area of tall ruderal vegetation at the top of the stream bank; the loss of these habitats is unlikely to result in significant ecological effects, but mitigation/compensation measures will be required to ensure the development results in a net gain to biodiversity, in accordance with planning policy.

The early mature trees and scrub vegetation on site will be retained as existing, although some of the elder shrubs may require pruning. There is potential for accidental damage to these and off-site trees in close proximity to the development, so appropriate mitigation measures will be required.

Mitigation and Compensation Measures

The following measures are required in order to protect retained habitats and ensure the stream wildlife corridor is conserved:

- All retained trees adjacent to/overhanging the working area will be protected in accordance with British Standard *BS 5837:2012: Trees in relation to design, demolition and construction. Recommendations.* The protection will be installed prior to the commencement of the proposed works.

- Appropriate pollution control measures must be implemented during works to limit pollution and run-off[7], and avoid contamination of the watercourse from accidental spillage or leakage of pollutants, such as oil, fuel or chemicals.
- The working area (to include access routes, parking, site compounds and storage areas, as required) will be defined and marked on a plan, which will be provided to site personnel prior to works commencing. Fencing will be required to define the working area and prevent accidental incursions by plant or personnel into the stream buffer zone, and other areas outside of the defined working area.
- The stream buffer must be retained and managed as semi-natural habitat to maintain and enhance its ecological value and functionality as a wildlife corridor. Existing bankside vegetation (scrub and tall ruderal plants) should be maintained and managed by cutting back small sections of tall ruderal vegetation (no more than 25 % of cover at any one time) on a rotational basis every 2-3 years to improve structural diversity. Areas at the edge of the developed site must be designed with native species seeding/planting and wildlife-friendly management practices. Management will aim to create a sheltered, undisturbed bank to ensure the continued functionality of the stream corridor. Measures should be agreed and detailed within a Landscape and Ecological Management Plan for the site.
- To avoid impacts during site clearance and construction works, there will be no nocturnal illumination of the site during these phases of the project.
- A lighting design strategy should be completed for the development. This strategy should show how and where external lighting will be installed (through the provision of appropriate lighting contour plans and technical specifications of lighting fixtures/fittings) so that it can be clearly demonstrated that lighting will not adversely impact upon the stream corridor; and demonstrate though the provision of appropriate lighting contour plans and technical specification that areas important for biodiversity (the stream) will not be adversely illuminated by internal light spill from the building or any external lighting. A variety of mitigation measures can be incorporated into the lighting scheme, including appropriate luminaire specifications, sensitive site configuration, screening, glazing treatments and dimming and part-night lighting. Mitigation measures should be designed in accordance with 'Bats and artificial lighting in the UK; Guidance Note 08/18' (Miles *et al.*, 2018). This will also reduce impacts on other nocturnal fauna.

Significance of Residual Effects

Providing the above measures are implemented, no residual effects are anticipated.

5.3 Protected and Priority Species

5.3.1 Bats

Potential Impacts

There are no suitable features for bats to roost on site, so no roosts will be directly affected by the proposals. The site offers some potential foraging opportunities for bats, but the loss of a small area of grassland is unlikely to significantly impact on local bat populations.

[7] https://www.gov.uk/guidance/pollution-prevention-for-businesses#construction-inspection-and-maintenance

Whilst the development is unlikely to impact on roosting or foraging bats, the stream offers a valuable wildlife corridor, which bats are likely to use for commuting through the landscape, especially if roosts are present in nearby buildings on the wider Moat Farm site. The site is currently unlit at night, although there is likely some light spill from nearby residential and office buildings to the south and west. In the absence of mitigation, any increase in lighting on site, either during construction or post-development from external security lighting or internal lights within the office, has the potential to spill onto the stream corridor and reduce its value for commuting bats.

Mitigation Measures

Measures to ensure an appropriate lighting scheme, outlined in Section 5.2, will minimise impacts on bats.

Significance of Residual Effects

Providing the above measures are implemented, no residual effects are anticipated.

5.3.2 Otter

Potential Impacts

There is evidence that at least one otter has commuted past the site along the stream, but there are no features suitable for laying up or breeding within close proximity to the site. There will be no impact on resting places, and the stream will be retained in the same condition and remain suitable for commuting and foraging otter following development. In the absence of mitigation, there is potential for light spill onto the stream, which could make the affected stretch less favourable for otter, but this is considered unlikely to have a significant impact on otters in the long term because it affects only a very small stretch of the stream.

Mitigation Measures

Measures to ensure an appropriate lighting scheme, outlined in Section 5.2, will minimise impacts on otter.

Significance of Residual Effects

Providing the above measures are implemented, no residual effects are anticipated.

5.3.3 Badger

Potential Impacts

There is no evidence of badger on site, so this species is unlikely to be affected by the development. There is a low risk that individuals could commute through or forage on site, and the future potential for sett building cannot be completely ruled out, so precautionary measures must be implemented to ensure compliance with legislation.

Mitigation Measures

The following measures will be implemented to ensure there are no adverse impacts on badgers:

- During the construction works any excavations will either be covered at night or a ramp will be provided so that should badgers fall in, they can escape. Furthermore, any open pipework must be covered at night to prevent animals entering and becoming trapped. This will also reduce risks to other species, including hedgehog and otter.

- In the unlikely event that a badger sett is found at any point during the works, all work must stop, and a suitably qualified ecologist will be consulted. Telephone numbers of such will be held on site.

Significance of Residual Effects
Providing the above measures are implemented, no residual effects are anticipated.

5.3.4 Birds

Potential Impacts
The trees, scrub and bankside vegetation offer some suitable nesting opportunities. The grassland is of limited value to ground-nesting species due to its small area and frequent disturbance. Overall, the development is considered unlikely to significantly impact on birds, but precautionary measures will be required to ensure that active birds' nests are not disturbed or damaged during works.

Mitigation Measures
The following measures will be implemented to ensure there are no significant impacts on birds:

- To avoid committing an offence, the removal of suitable nesting habitat (e.g. pruning of scrub/trees) should be undertaken outside the bird breeding season (March to August inclusive). If this is not possible, vegetation will be checked immediately prior to works commencing by a suitably qualified ecologist. If there are nesting birds present, works cannot continue until the chicks have fledged and left the nest.

Significance of Residual Effects
Providing the above measures are implemented, no residual effects are anticipated.

5.3.5 Reptiles

Potential Impacts
The unmanaged grassland and stream habitats offer some potential commuting and basking opportunities for reptiles and are likely to be used occasionally by wide-ranging species such as grass snake, but overall it is considered unlikely that any reptiles would be dependent on the site. Therefore, no significant impacts on reptiles are anticipated, but there remains a low risk of harm to individuals if present on site during works.

Mitigation Measures
The following precautionary measures should be adopted to ensure compliance with legislation:

- Site clearance will ideally be undertaken during the active season for these species (March to October, weather dependent). Prior to works any areas of long grass in the construction area will be cut short, starting at the southern end of the site and moving northwards to encourage any animals present to move into the retained habitat along the stream. If this is not possible, greater care will be taken during the clearance to check for hibernating animals in long grass, with works to be undertaken by hand.
- Construction materials imported onto the site could be used by reptiles for shelter. Any construction materials must therefore be stored on land that is of low suitability for these species, i.e. short grassland or hard standing. Materials storage will be confined within the development footprint and/or adjacent farmyard and no storage will occur in retained habitats along the stream.

- If at any point during these activities, or at any other stage during works, a reptile is discovered, all work must stop, and a suitably qualified ecologist must be consulted. Telephone numbers of such will be held on site.

Significance of Residual Effects

Providing the above measures are implemented, no residual effects are anticipated.

5.3.6 Great crested newt

Potential Impacts

The closest waterbody is a linear pond approximately 120 m north of the site on the far side of the stream; all other known ponds are over 500 m from the site, and there are no records of great crested newt within a 1 km radius of the site.

The site offers some potential terrestrial opportunities for great crested newt, although the value of this is limited by the isolation from suitable waterbodies. Natural England's great crested newt rapid risk assessment tool has been applied to the proposed development, where it is assumed that the closest pond (120 m north) supports breeding great crested newts; the results are shown in Table 5.1.

Table 5.1: Natural England's great crested newt rapid risk assessment tool results

Component	**Likely effect** (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	**Notional offence probability score**
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	0.01 - 0.1 ha lost or damaged	0.01
Land >250m from any breeding pond(s)	No effect	0
Individual great crested newts	No effect	0
	Maximum:	0.01
Rapid risk assessment result:	**GREEN: OFFENCE HIGHLY UNLIKELY**	

As shown above, the proposed development is highly unlikely to impact on great crested newts. However, because the potential presence of this species in the wider area cannot be completely ruled out, standard precautionary measures must be implemented during works to ensure compliance with protected species legislation.

Mitigation Measures

The measures outlined in Section 5.3.5 will also protect great crested newts. An additional measure is provided below:

- If at any point during these activities, or at any other stage during works, a great crested newt is discovered, all work must stop, and a suitably qualified ecologist must be consulted. Telephone numbers of such will be held on site.

Significance of Residual Effects

Providing the above measures are implemented, no residual effects are anticipated.

5.3.7 Other priority animals

Potential Impacts

The habitats on and immediately adjacent to site offer some potential opportunities for wildlife such as hedgehog and polecat. The stream, trees and scrub will be retained, but increased night-time lighting has the potential to deter these species from using the site. Because the site is only a small area, and other suitable habitat will remain in the wider landscape, no significant impacts on these species are anticipated.

The habitats on the site are unlikely to support rare or priority invertebrate species due to their small area and low botanical diversity. No significant impacts are anticipated, and this species group is considered further only with regard to potential enhancement measures.

Mitigation Measures

The measures detailed in the above sections will avoid impacts upon hedgehog occurring during construction. The following additional measure is provided:

- If a hedgehog or polecat is discovered during the works, it will be moved to a place of safety nearby. If a hibernating hedgehog is discovered, it will be put in a safe place and an appropriately qualified ecologist will be immediately contacted for advice.

Significance of Residual Effects

Providing the above measures are implemented, no residual effects are anticipated.

5.4 Invasive Alien (Non-Native) Species

No evidence of invasive species has been identified on site, but the survey was carried out early in the season, when some plants may not be identifiable, and there remains potential for such species to colonise the site prior to development works. Whilst no impacts are predicted, so no specific measures are necessary, contractors must be vigilant during works and if evidence of such species (e.g. Himalayan balsam or giant hogweed) is found on site works will stop while a specialist is contacted for advice on how to proceed.

5.5 Summary of Mitigation and Compensation Measures

A summary of mitigation and compensation measures is given below in Table 5.2; these measures are given in detail within the sections above.

5.6 Validity of Report

The results of this assessment are only valid for a maximum of two years from the date the site visit was carried out (March 2021). Should the subsequent works be delayed beyond this date, the survey should be updated; it should also be noted that local planning authorities may require updated surveys within a shorter timescale than two years.

Table 5.2: Summary of Mitigation and Compensation Measures

Feature	Mitigation and Compensation Measures	How will Measure be Secured?	Significance of Residual Effects
Stream	• Standard measures to prevent pollution of the stream must be implemented during the construction and operational phases. • Stream buffer to be managed as an ecological corridor, with details to be agreed and detailed within a Landscape and Ecological Management Plan for the site. • No night-time lighting of the site during site clearance and construction. • Scheme lighting after construction must avoid increase in illumination of the stream to maintain its functionality as a wildlife corridor.	Planning Condition	None
Trees/scrub	• All retained trees and scrub will be protected in accordance with British Standard BS 5837:2012: Trees in relation to design, demolition and construction. Recommendations.	Planning Condition	None
Bats, otter	• No night-time lighting of the site during site clearance and construction. • Scheme lighting after construction must avoid increase in illumination of the stream which provides suitable foraging/commuting habitat.	Planning Condition	None
Badger	• Precautionary measures to be installed during construction period (cover holes/pipework at night or install ramps). • If a badger sett is discovered works must stop while an ecologist is contacted for advice.	Planning Condition	None
Nesting birds	• Remove any nesting habitat outside of nesting season. If this is not possible, potential nesting habitat will be checked immediately prior to works commencing by a suitably qualified ecologist. If nesting birds are found, works cannot continue until the chicks fledge and leave the nest.	Planning Condition	None
Amphibians, reptiles, hedgehog, polecat	• Precautionary measures during site clearance (vegetation cut and maintained in short condition) and during construction (avoid creation of suitable refuge features). • If at any time a great crested newt or reptile is discovered, all work must stop, and an ecologist must be consulted. • If a hedgehog or polecat is discovered, it will be moved to a place of safety nearby.	Planning Condition	None
Invasive plants	• If at any point any such species is discovered, all work must stop, and a suitably qualified ecologist must be consulted.	Planning Condition	None

6 RECOMMENDATIONS FOR ECOLOGICAL ENHANCEMENT

Current planning policy requires that development projects minimise ecological damage and should contain elements of ecological enhancement. The Natural Environment White Paper (2011) and National Planning Policy Framework (2019) require that development results in net gains for biodiversity.

New buildings are often well-sealed and provide little to no value for local wildlife, but design options are available to create opportunities for nesting and/or roosting to benefit a range of species in perpetuity, with little or no requirement for maintenance:

- Incorporate at least two bird boxes into the walls of the new building to provide opportunities for priority species, such as house sparrow. Boxes must be installed out of direct sunlight, ideally facing north or east and not above windows or doors. Suitable bird box products could include:
  - Schwegler 1SP sparrow terrace – box erected on outside of building.
  - Habibat sparrow terrace box – box is integral to external wall of buildings.

Figure 6.1: Schwegler 1SP sparrow terrace (left) and Habibat terraced sparrow box (right)

- Incorporate one bat box/tube in the walls of the new building, as close to the roof as possible. Boxes should face between south and south-west and be positioned away from artificial lighting. Suitable bat boxes could include:
  - Vivara Pro Build-in Woodstone Bat Tube (built into walls, behind cladding with appropriate opening).
  - Beaumaris Woodstone Bat Box (installed on external wall).

Figure 6.2: Vivara Pro Build-in Woodstone Bat Tube (left) and Beaumaris Woodstone Bat Box (right)

- Install 'bee bricks' and create log piles[8] on site to provide habitat for fungi, lichens, saproxylic invertebrates, amphibians, reptiles and hedgehog.

- Design any formal soft landscaping areas, such as flowerbeds and shrubberies, to incorporate plants that can provide a continuous sequence of flowers suitable for pollinators from March until October[9], as well as fruit-bearing trees and shrubs to provide foraging opportunities for birds and mammals.

[8] https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/dead-wood-for-wildlife/
[9] https://www.rhs.org.uk/science/pdf/conservation-and-biodiversity/wildlife/rhs-perfect-for-pollinators-garden-plants

7 RELEVANT LITERATURE

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APPENDIX 1 – LEGISLATION AND PLANNING POLICY

A1.1 Introduction

This section briefly lists legal protection/planning policy applying to designated sites, species or habitats mentioned in this report. It does not comprehensively reflect the text of the legislation/policy and it should not be relied upon in place of it. The following documents are relevant:

- The Local Government Act 1985;
- The Wildlife and Countryside Act 1981 (as amended);
- The Environmental Protection Act 1990;
- The Countryside and Rights of Way (CRoW) Act 2000 (in England and Wales);
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- EU Regulation 1143/2014 on Invasive Alien Species, as amended by The Invasive Non-native Species (Amendment etc.) (EU Exit) Regulations 2019;
- The Natural Environment White Paper (England) (DEFRA, 2011);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011), which underpins the UK Post-2010 Biodiversity Framework (JNCC & DEFRA, 2012);
- National Planning Policy Framework (MHCLG, 2019); and
- Vale of Aylesbury Local Plan (Submitted 2018).

A1.2 Habitats of Principal Importance

Habitats designated as being *"of principal importance for the purpose of conserving biodiversity"* as listed under Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006 are priority habitats for the UK Post-2010 Biodiversity Framework and form a key component of the Biodiversity Strategy for England. They are material considerations in the planning process.

A1.3 Protected Species

A1.3.1 Dormouse, great crested newt, otter, and all species of British bat

The dormouse *Muscardinus avellanarius*, great crested newt *Triturus cristatus*, otter *Lutra lutra*, and all species of British bat (*Vespertilionidae* and *Rhinolophidae*) are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and receive some limited protection under Section 9. These species are also all listed as protected species in Schedule 2 of The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which gives them full protection under Regulation 43.

It is also an offence to set and use articles capable of catching, injuring or killing such species (for example a trap or poison), or knowingly cause or permit such an action.

The dormouse, great crested newt, otter and seven species of British bat are listed as species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

A1.3.2 White-clawed crayfish

The white-clawed crayfish *Austropotamobius pallipes* is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and receives protection under Section 9 parts 1, from killing, taking or injury, and Part 5, which prevents their sale. They are also listed under Annexes II and V of The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019; Annex II listing requires that Special Areas of Conservation (SACs) be established specifically to conserve the species.

The white-clawed crayfish is listed as a species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

A1.3.3 Water vole

Water vole *Arvicola amphibius* is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and receives full protection under Section 9. Water vole is listed as a species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

A1.3.4 Common reptiles

Common lizard *Zootoca vivipara*, grass snake *Natrix helvetica*, slow worm *Anguis fragilis*, and adder *Vipera berus* are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), in respect of Section 9(5) and part of Section 9(1). These species are included as species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

A1.3.5 Birds

All species of bird are protected under Section 1 (1) of the Wildlife and Countryside Act 1981 (as amended). Certain species are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and receive protection under Section 1(5). There are special penalties where offences are committed for any Schedule 1 species.

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 includes 49 bird species which are of principal importance for the purpose of conserving biodiversity in England.

A1.3.6 Badger

The badger *Meles meles* is protected in Britain under the Protection of Badgers Act 1992. The legislation protects badgers and their setts.

The badger is also protected under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) relating specifically to trapping and direct pursuit.

A1.4 Priority Species

Various vertebrate, invertebrate, plant and fungal species potentially present in the area are listed as species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. They are a material consideration in the planning process.

A1.5 Invasive Alien (Non-Native) Species

Several invasive, non-native animal and plant species are listed on Schedule 9, Parts I and II respectively, of the Wildlife and Countryside Act 1981 (as amended). Schedule 14 (1 and 2) makes it illegal to release or allow to escape (animals) into the wild, or to plant or cause to grow (plants) in the wild, any animal or plant species listed on schedule 9 (parts 1 and 2).

EU Regulation (1143/2014) on invasive alien (non-native) species, as amended by The Invasive Non-native Species (Amendment etc.) (EU Exit) Regulations 2019, imposes restrictions on 49 animal and plant species. Strict restrictions (subject to certain exemptions) mean that these species cannot be imported, kept, bred, sold, used or exchanged, allowed to reproduce, grown or cultivated, or released into the environment. The Invasive Alien Species (Enforcement and Permitting) Order 2019 provides enforcement provisions, prescribes offences and penalties to comply with the requirements of the regulations.

APPENDIX 2 – PROTECTED AND PRIORITY SPECIES WITHIN 1 KM