



**Land North of Gilnor**

**Drybrook**

**Preliminary Ecological Appraisal**

**June 2021**

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# Acer Ecology

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## Document Verification Table

Land North of Gilnor, Drybrook Preliminary Ecological Appraisal				
Revision	Date	Prepared by	Checked by	Verified by
1.0	16 June 2021	Alice Wynne-Griffiths Assistant Ecologist 	Rory Jones MCIEEM Senior Ecologist 	Paul Hudson MCIEEM Principal Ecologist 

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## Summary

<b>Brief and Site Location</b>	<p>Acer Ecology Ltd were instructed by Christopher Bundy to conduct a preliminary ecological appraisal of land north of Gilnor, The Branch, Drybrook, GL17 9DB, within the boundary of Gloucestershire County Council (Ordnance Survey Grid Reference centred at: SO 6469 1611).</p>
<b>Development Proposals</b>	<p>The proposed development works comprise clearance of the site to facilitate the construction of a new two-storey dwelling. This will involve the permanent clearance of areas of tall ruderal vegetation. Localised felling of trees may also be required, as several ash trees are suffering from ash dieback.</p> <p>The proposed development plan is provided in Appendix 1.</p>
<b>Impacts to Key Receptors</b>	<p>No statutory or non-statutory designated sites are anticipated to be affected by the works.</p> <p>Habitats of value within the survey area include a watercourse (Old Engine Brook) and species-rich hedgerow. The current development proposals are likely to have negative impacts to varying degrees on these habitats. It is therefore essential that the impacts be minimised or appropriately mitigated.</p> <p>The proposed development could potentially have adverse impacts of varying degrees on a range of legally protected species, including great crested newts, common reptiles, nesting birds, dormice, and commuting and foraging bats.</p> <p>There are significant stands of Himalayan Balsam present within the survey area, particularly along the edges of the watercourse. The long-term eradication of this invasive species from the site and its ongoing management is essential to preserve the sites biodiversity.</p>
<b>Recommendations</b>	<p>The following additional surveys are required:</p> <ul style="list-style-type: none"> <li>• Great crested newt eDNA survey;</li> <li>• Reptile and terrestrial-phase great crested newt survey; and</li> <li>• Update otter inspection.</li> </ul> <p>The following provisional recommendations have been developed based on the development proposals available at the time of writing:</p> <ul style="list-style-type: none"> <li>• Precautionary measures;</li> <li>• Mitigation measures; and</li> <li>• Compensation and enhancement measures.</li> </ul>
<b>Licensing Requirements</b>	<p>A European protected species mitigation licence may be required upon completion of further surveys.</p>
<b>Conclusions</b>	<p>The full extent of ecological impacts and potential constraints of the proposed development cannot be fully determined, based on the results of the preliminary ecological appraisal survey alone. Further survey work will be required before such assessments can be comprehensively made.</p> <p>At this stage, the site's ecological value is not considered to represent a fundamental in-principal constraint to the proposed development.</p> <p>If development works do not begin within eighteen months to two years of the date of this report of this report, an update survey is likely to be required in accordance with guidance from Natural England, (CIEEM, 2019) and BS 42020:2013, to determine if conditions have changed since those described in this report.</p>

## **1. Introduction**

### **1.1. Brief**

Acer Ecology Ltd were instructed by Christopher Bundy to conduct a preliminary ecological appraisal of land north of Gilnor, The Branch, Drybrook, GL17 9DB within the boundary of Gloucestershire County Council (Ordnance Survey Grid Reference centred at: SO 6469 1611)<sup>1</sup>. The purpose of the assessment was to document the baseline ecological condition of the survey area, which comprises the red line boundary shown in Plan 1. This included identification of any designated sites or habitats that could be affected by the proposed works, and identification of or potential for, protected and/or otherwise notable species of conservation interest that could be affected. Potential ecological constraints were identified, and subsequent recommendations developed.

This assessment will provide initial recommendations based on the development proposals available at the time of writing. They should be revised upon finalisation of the design.

### **1.2. Site Description**

The site proposed for development measures approximately 0.24ha and comprises a plot of land to the north of Gilnor, bordered by hedgerows and scattered trees. A stream, Old Engine Brook, forms the western boundary of the site, while a smaller brook forms the northern boundary. A large portion of the site has been cleared relatively recently. The wider landscape is largely rural, mainly comprising plantations on ancient woodland sites. The village of Drybrook lies 1.2km to the north and the A4136 lies 0.1km to the north-west of the site.

### **1.3. Proposed Works**

The proposed development works comprise clearance of the site to facilitate the construction of a new two-storey dwelling. This will involve the permanent clearance of areas of tall ruderal vegetation. Localised felling of trees may also be required, as several ash trees are suffering from ash dieback.

The property will be accessed via a new entrance to the east of the existing entrance at the south-west, while the existing entrance will be used for direct access to an agricultural area. A tree-lined driveway will lead to the property and a garage will be situated to the west. A private amenity garden will also be incorporated into the development footprint, located to the east of the property.

The proposed development plan is provided in Appendix 1.

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<sup>1</sup> Latitude and Longitude: 51.842525455035, -2.5139368003606206/ what3words: fattest/foresight/thread

## **1.4. Scope of the Study**

The study comprised the following:

- A desk study to identify existing information on statutory and non-statutory sites of nature conservation interest, and records of notable or protected habitats or species within the site and its environs;
- A Phase 1 Habitat Survey of the site, extended to search for evidence of, and potential for, protected fauna; and
- Identification of potential ecological constraints to the proposed works at the site and assessments of impacts including appropriate mitigation measures where necessary.

## **1.5. Reporting**

This report aims to:

- Outline the methodology used during the survey;
- Present the results of the survey;
- Provide an ecological evaluation of on-site habitats, including an assessment of the potential for protected species;
- Provide an assessment of the potential impacts of the development proposals on ecological receptors identified through the desk and field study;
- Provide an assessment of the potential ecological constraints to the proposals; and
- Provide recommendations for further survey, avoidance, mitigation and enhancement where appropriate.

## 2. Methods

The survey was undertaken following standard methods as described in the Chartered Institute of Ecology and Environmental Management (CIEEM) Preliminary Ecological Appraisal 2016 guidelines, and the Phase 1 Habitat Survey methodology (Joint Nature Conservation Committee, 2010). The methodology utilised for the survey work comprised a desk study, habitat survey and a survey of protected and notable species.

### 2.1. Desk Study

#### 2.1.1. Protected Sites, Habitats and Species

Information on designated sites (Table 1) and protected species was obtained from the following sources. The legislation and policy relating to statutory and non-statutory designated sites can be found in Appendix 2. Plans 2 and 3 show the protected sites in relation to the proposed development site.

Table 1: Summary of Designated Sites and Other Abbreviations

Abbreviations	
Special Areas of Conservation	SAC
Special Protected Area	SPA
Site of Special Scientific Interest	SSSI
National Nature Reserve	NNR
Local Nature Reserve	LNR
Local Wildlife Site	LWS
Ancient Semi-Natural Woodland	ASNW
Restored Ancient Woodland Site	RAWS
Plantation on Ancient Woodland Site	PAWS
Gloucestershire Environmental Records Centre	GCER
Natural England	NE

Table 2: Sources of Data

Source	Data	Radius of Search
NE Geographical Information Systems (GIS) Layers	Statutory and non-statutory nature conservation designated sites ASNW, RAWS and PAWS	Ramsar/SACs/SPAs/SSSIs/NNRs)/LNRs – 2km <sup>2</sup> . SACs (designated for bats) - 10km. 2km.
GCER	Protected species records LWSs	1km. 1km.
Multi-agency Geographic Information for the Countryside (Magic) website	European Protected Species Licences Permitted	2km.

<sup>2</sup> The citations of all the SSSIs and SACs within 2km of the site were consulted to determine if any of them had features or species which could be affected by the development proposals.

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All available records of bat roosts were considered. For other species, only records collected within the last 10 years were considered relevant.

## **2.1.2. Landscape Context**

The site and wider landscape were assessed and characterised using aerial images and Ordnance Survey maps. The presence of off-site features and habitats, which add to the ecological value within the wider area (for example, ponds within 0.5km of the site) were identified. Where appropriate, such features were scoped into the detailed assessment of impacts presented in Section 3 below.

## **2.1.3. Ancient Woodland**

Although ancient woodland is not a designated site as such, it is often listed as a designated site due to its ecological significance and associated protection. Ancient woodland has therefore been included within the non-statutory designated site section of this report.

## **2.1.4. Planning Authority**

The Gloucestershire County Council Planning Portal<sup>3</sup> was consulted to determine if any previous survey information was available for the site, or immediate surroundings.

An internet-based search of the Gloucestershire Local Biodiversity Action Plan (BAP)<sup>4</sup> was undertaken.

## **2.2. Field Study**

### **2.2.1. Personnel**

The field survey was undertaken in fair weather on the 28<sup>th</sup> May 2021 by Rory Jones<sup>5</sup> MCIEEM, with the assistance of Alice Wynne-Griffiths<sup>6</sup>.

### **2.2.2. Vegetation and Habitats**

The vegetation and habitat types present within the survey area were categorised and mapped in accordance with the standard<sup>7</sup> Phase 1 Habitat assessment methodology (Joint Nature Conservation Committee, 2010), dominant and conspicuous plant species were recorded for each habitat. Target notes were used to record information on features of ecological interest, such as evidence of, or habitats with potential to support protected species. Following the completion of the survey, a colour-coded habitat plan

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<sup>3</sup> <https://www.gloucestershire.gov.uk/planning-and-environment/planning-applications/search-and-track-planning-applications/>

<sup>4</sup> <https://www.gloucestershirenature.org.uk/biodiversity-action-plan-bap>

<sup>5</sup> Rory is employed by Acer Ecology and is experienced in undertaking preliminary ecological appraisals. He graduated with a degree in Environmental Geoscience from Cardiff University and has nine years postgraduate experience in the environment sector. He has undertaken extensive training in protected species assessment, phase 1 habitat surveys and botanical surveying. He holds Welsh survey licences for bats, great crested newts and dormice, together with a Natural England nest inspection licence for barn owl. Further details of his experience and qualifications can be found on LinkedIn.

<sup>6</sup> Alice graduated in Zoology with first class honours from the University of Bristol. She is currently receiving training from Acer Ecology, working as an Assistant Ecologist, gaining ecological surveying experience.

<sup>7</sup> Some additional categories were also used if applicable e.g. hard standing and Japanese knotweed.

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was digitised using QGIS to show the extent and distribution of the different habitat types present within the site (see Plan 3).

Target notes (TN) were labelled on the plan where any features of interest too small to map were recorded.

Habitats on site were assessed to determine whether they qualified as Section 41 habitats (Natural Environment and Rural Communities (NERC) Act, 2006), Priority Habitats of the UK Biodiversity Action Plan (BAP) (Biodiversity Reporting & Information Group, 2007), habitats of local priority for conservation, for example in the relevant Local Biodiversity Action Plan (LBAP), or if they qualified for inclusion as a non-statutory designated site (LWS).

Hedgerows within the site were not formally assessed against the definitions within the Hedgerow Regulations 1997 as this was beyond the scope of the assessment.

The presence of invasive plant species listed on Schedule 9<sup>8</sup> of the Wildlife and Countryside Act 1981 (as amended), such as Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*) and Japanese knotweed (*Fallopia japonica*) were also noted during the survey, if present.

### 2.2.3. Protected and Notable Species

During the survey, emphasis was placed on searching for evidence of, and habitats with, potential to support protected or notable species, especially species meeting any of the following criteria:

- Listed under the and the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species (Amendment) (EU Exit) [‘CHSAEU’] Regulations 2019;
- Listed under The Natural Environment and Rural Communities (NERC) Act 2006 Section 41 Habitats or Species of Principle Importance for Conservation of Biological Diversity in England;
- Listed as a local priority for conservation, for example in the relevant Local Biodiversity Action Plan (LBAP);
- Red Listed using International Union for the Conservation of Nature (IUCN) criteria (e.g. in one of the UK Species Status Project<sup>9</sup> reviews, in the Species of Conservation Concern Red, Amber or Near Threatened List<sup>10</sup>, or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
- Listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a Nationally Notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/or
- Endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

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<sup>8</sup> Schedule 9 species of plants and animals are ones that do not naturally occur in Great Britain but have become established in the wild and represent a threat to the natural fauna and flora.

<sup>9</sup> The Species Status project is the successor to the JNCC’s Species Status Assessment project, providing up-to-date assessments of the threat status of various taxa using the internationally accepted Red List guidelines (<http://jncc.defra.gov.uk/page-1773>).

<sup>10</sup> Eaton *et al.* (2015) Birds of conservation concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108: 708-746.

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It should be noted that only those species with potential to be present on-site are mentioned within this report. The methodologies used were as follows:

## ***Birds***

Any birds observed during the field survey were recorded, in addition to features capable of supporting nesting birds (e.g. trees, hedgerows, buildings, bramble, ruderal vegetation and rough grassland etc.). The site was also assessed for its actual and potential suitability to support Wildlife and Countryside Act 1981 (as amended) Schedule 1 species.

A comprehensive bird survey, such as a breeding bird survey, was not undertaken as this was beyond the scope of the assessment.

## ***Bats***

### Preliminary Ground-level Roost Assessment

A preliminary ground-level roost assessment of the trees within the survey area was undertaken, looking for features that bats could use for roosting (Potential Roost Features<sup>11</sup> (PRF) and evidence of bats (i.e. droppings in, around or below a PRF; odour emanating from a PRF; audible squeaking at dusk or during warm weather; or staining below the PRF). A systematic inspection was carried out around all accessible aspects of the tree, from both close to the trunk and further away.

The trees were assessed for their suitability to support roosting and hibernating bats in accordance with Table 4.1 of the Bat Conservation Trusts Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) (See Appendix 6). A high-powered torch (Clulite), binoculars and a ladder were used as appropriate during the survey.

The trees have been described in detail in the tree report which should be read in conjunction with this report (Plan 5).

### Buildings Assessment

The buildings present within the survey area comprised one derelict structure and one partially built, closed structure, both considered to have negligible potential to support roosting bats. Therefore, a full building assessment was not carried out.

### Terrestrial Habitat Assessment

A preliminary assessment of the value of the site for bats (and any potential roost sites therein) was made in accordance with Table 4.1 of the Bat Surveys for Professional Ecologists (Collins, 2016) (see Appendix

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<sup>11</sup> Potential Roost Features that bats may use identified by Andrews include: woodpecker-holes; squirrel-holes; knot-holes; pruning-cuts; tear-outs; wounds; cankers; compression-forks; butt-rots; lightning strikes; hazard-beams; subsidence-cracks; shearing cracks; transverse cracks; welds; lifting bark; frost-cracks; fluting and ivy.

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6). The assessment was based on the relative abundance and quality of habitat features within the site, and surrounding landscape, suitable for roosting, foraging and commuting bats.

## ***Dormice***

The hedgerows on site were assessed for their suitability to support dormice (*Muscardinus avellanarius*) with reference to guidance such as The Dormouse Conservation Handbook (Bright, Morris & Mitchell-Jones, 2006). The structure and composition of these habitats were assessed with respect to the presence of flower, fruit or nut-bearing food-plants such as hazel (*Corylus avellana*) (a favoured food-plant of dormice), oak (*Quercus* sp.), honeysuckle (*Lonicera periclymenum*), bramble (*Rubus fruticosus* agg.), sycamore (*Acer pseudoplatanus*), as well as other trees and shrubs listed in Bright, Morris & Mitchell-Jones (2006) as being of value to dormice. In addition, connectivity to other areas of suitable habitat in the wider landscape, such as hedgerows and woodland, was assessed.

No hazel was present on site and therefore it was not possible to undertake a search for hazelnut shells to determine if they had been opened by dormice.

A full nest tube/ box survey was not undertaken as this was beyond the scope of the assessment.

## ***Great Crested Newts***

The survey area was appraised for its suitability to support great crested newts (*Triturus cristatus*) (GCN). The assessment was based on guidance outlined in the Herpetofauna Workers' Manual (Joint Nature Conservation Committee, 2003) and the Great Crested Newt Conservation Handbook (Langton, Beckett & Foster, 2001).

Ordnance Survey maps and aerial images of the land surrounding the site were consulted to determine if any water bodies were present within the site or within 0.5km of it. One potentially suitable water body was identified within the study area (see Plan 6). The Habitat Suitability Index (HSI) (Oldham *et al.*, 2000) was applied to this water body (where access permitted).

As part of the assessment, ponds are scored using 10 suitability indices<sup>12</sup>: Each of these features is awarded a score between 0 and 1, and a final score is calculated, also between 0 and 1 (a higher score representing more optimal conditions for GCN). This final score enables the pond to be ranked in terms of its suitability (poor, below average, average, good or excellent) and to estimate the likely presence of GCN within the water body.

The HSI assessment is not a substitute for undertaking GCN surveys, but can be used to inform the assessed likelihood of presence or absence. It is not sufficiently precise to prove that a higher score confirms presence, or a lower score confirms absence.

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<sup>12</sup> The 10 suitability indices are: location, pond area, pond drying, water quality, shade, waterfowl presence, fish presence, number of ponds in the local area, terrestrial habitat, and macrophyte cover.

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Old Engine Brook also lies within 0.5km of the study area. However, fast flowing water is considered to act as a barrier to GCN migration (English Nature, 2001). This water body was therefore deemed unsuitable for supporting GCN.

A full GCN survey was not undertaken, as this was beyond the scope of this assessment.

## **Otters**

A preliminary assessment for signs of otter (*Lutra lutra*) was undertaken following the advice provided by Strachan & Jefferies (1996) and Chanin (2003). The banks of the stream and brook were searched for evidence of otter activity within 10m of the bank. Field signs of otter were recorded if present including spraints (faeces showing food remains), footprints, feeding remains and couches (above ground resting sites normally in thick vegetation cover), as well as potential or actual breeding sites and resting places (i.e. holts or natal dens) which are usually found under roots of bank side trees or in rock piles.

A full otter survey was not undertaken as this was beyond the scope of the assessment.

## **Water Voles**

An assessment of water bodies within and adjacent to the survey area was undertaken to determine their suitability for supporting water voles (*Arvicola amphibius*), following methods set out in the Water Vole Conservation Handbook (Strachan & Moorhouse, 2006). In addition, a search for evidence of activity was undertaken, including droppings, latrines, burrows, footprints and feeding lawns, of any areas considered suitable.

A full water vole survey was not undertaken as this was beyond the scope of this assessment.

## **White-Clawed Crayfish**

An assessment of the water bodies within the survey area was undertaken to determine their suitability to support white-clawed crayfish (*Austropotamobius pallipes*) (WCC), based on the habitat requirements set out in the Ecology of the White-Clawed Crayfish Handbook (Holdich, 2003). Specifically, the presence of undermined/overhanging banks, soft banks for burrows, cobble and rock substrate, submerged refugia and macrophytes.

A full WCC survey was not undertaken as this was beyond the scope of this assessment.

## **Badgers**

Earth embankments, wooded copses, hedgerows and dense bramble beds are habitat features that often contain evidence of badger (*Meles meles*). Where present on-site these and other suitable habitat features were searched for such evidence. Where present, the location of badger signs such as setts, runs, dung pits or latrines, prints, hair and foraging snuffle holes were recorded.

A full badger survey was not undertaken as it was beyond the scope of this assessment.

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## ***Reptiles***

An assessment of the suitability of on-site habitats to support reptiles was made. Reptiles require a diverse range of habitats to meet their needs such as hedgerows, scrub, rough grassland, woodpiles, rubble, banks and compost heaps. The potential of the site to provide hibernation opportunities and spring/summer/autumn habitat was also assessed, with reference to guidance provided in the Herpetofauna Workers' Manual (Joint Nature Conservation Committee, 2003), the Reptile Management Handbook (Edgar, Foster & Baker, 2011) and the Reptile Mitigation Guidelines Technical Note TIN 102 (Natural England, 2013). The following factors were considered: vegetation type and structure; insolation (sun exposure); slope aspect; topography; surface geology; habitat connectivity; habitat size; prey abundance; refuge opportunity; hibernation opportunity; egg-laying potential for grass snake (*Natrix natrix*); public pressure; percentage of shade; levels of disturbance and management regime.

A targeted presence/ likely absence reptile survey was not undertaken as it was beyond the scope of this assessment.

## **Other Species**

General habitat suitability and incidental sightings of other animal species were also noted.

### **2.2.4. Assessment of Ecological Value**

The value of the habitats and features of the site have been provisionally evaluated and graded in accordance with a geographical frame of reference as detailed in Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2018). The level of value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, district, local and, lastly, within the immediate zone of influence of the site only. Brief descriptions of how Acer Ecology interprets these categories are set out in Appendix 5.

### **2.2.5. Constraints and Limitations**

#### General Temporal Constraints

Any ecological survey can only identify what was present on-site at the time the survey was conducted and habitat usage by species can change over time.

time of the survey, which is likely to be constant and a fair reflection of the habitat quality present.

#### Incomplete Survey Information

Full surveys for the protected species listed previously have not yet been carried out. For some species of fauna for which evidence has been found or which are considered likely to occur on site, further targeted survey is advised (see Section 4).

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## Restricted Access to Water Bodies Within 0.5km of Site

Access to the waterbody within 0.5km of the site was restricted as it was situated on private land and access permissions had not been agreed at the time of the survey. The waterbody was therefore viewed from a distance, using binoculars, from the adjacent public right of way. This, however, is not considered to be a significant survey constraint and is unlikely to have altered the assessments made.

## 3. Baseline Ecological Conditions, Evaluation and Development Impacts

The baseline conditions and evaluation of the *in-situ* habitats and the actual/potential presence of protected species are discussed in this section. Potential impacts on protected sites, *in-situ* habitats and protected or notable species arising from the proposed development are identified, including both direct and indirect impacts, and those associated with construction and operational stages.

A summary of relevant legislation and planning policies relating to protected sites, habitats and species is provided in Appendices 2 and 3.

### 3.1. Designated Sites

#### 3.1.1. Statutory Nature Conservation Designated Sites

##### Statutory Sites (SACs or SSSIs) Designated for Bats within 10km of Site

The proposed development site lies within 10km of one SAC that has been specifically designated for bats. At its nearest point the Wye Valley and Forest of Dean Bat SAC lies 1.5km to the north-east and includes buildings and caves which are used by lesser horseshoe (*Rhinolophus hipposideros*) and greater horseshoe (*Rhinolophus ferrumequinum*) bats for breeding and hibernating. Other bat species found within the SAC include brown long-eared (*Plecotus auritus*) and Natterer's bats (*Myotis nattereri*). The area forms 'one of the most important areas for woodland conservation in the UK' and supports a variety of woodland habitats.

##### SSSIs within 2km of Site

There are two SSSIs designated for their conservation value within a 2km search radius of the site. These are listed in order of proximity below:

- Westbury Brook Ironstone Mine SSSI, located 1.4km to the north-east and designated for its geological interest; and
- Edgehills Quarry SSSI, located 1.5km to the north-east, also designated for its geological value.

##### NNRs and LNRs

No NNRs or LNRs are present within 2km of the site.

##### Protected Sites Summary

Given the small scale and localised nature of the proposed development, as well as the limited scope for impacts outside of the footprint of the proposed works, no adverse impacts to the protected sites are likely to occur. The Wye Valley and Forest of Dean Bat SAC, Westbury Brook Ironstone Mine SSSI and Edgehills Quarry SSSI are separated from the proposed development site by several roads. Considering this limited ecological connectivity, no adverse impacts to these sites is anticipated. These sites are not mentioned further in this report.

## **3.1.2. Non-statutory Nature Conservation Designated Sites**

### LWSs

Three LWSs were recorded within 1km of the study area. These were:

- Steam Mills LWS, located 0.28km to the south-west and designated for its 'ponds, watercourse, semi-natural grassland, marsh, bog, swamp, mire and tall herb fen with plant, invertebrate and vertebrate species interest';
- Cinderford Linear Park LWS, located 0.43km to the south-west, designated for the same reasons as Steam Mills; and
- Hawkwell Inclosure LWS, located 0.55km to the south, an ancient woodland site of over 2ha in area.

Steam Mills is the nearest LWS, however, it is separated from the proposed development site by several roads. Considering this limited ecological connectivity, no adverse impacts to Steam Mills, or to the remaining two LWSs, are anticipated.

### Ancient Woodland

There are seven areas of ASNW and seven Planted Areas of Woodland Sites (PAWS) located within 2km of the proposed development site, the nearest of which lies immediately to the east of the site.

Considering the small scale of the works, none of these woodlands are anticipated to be affected by works. They are therefore not mentioned further in this report.

## **3.2. Habitats and Vegetation**

The results of the general survey of habitats and vegetation are shown on Plan 4. A botanical species list is provided in Appendix 4.

The site consists of twelve elements which are described in detail in the following table.

Table 3: Habitats Recorded on Site

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Habitat	Description	Ecological Value	Development Impacts
Dense Scrub (A2.1)	A strip of dense scrub lies along the bank of Old Engine Brook, at the western site boundary (Photo 1). The scrub grades into nearby tall ruderal vegetation, including dominant ground elder ( <i>Aegopodium podagraria</i> ) and frequent meadowsweet ( <i>Filipendula ulmaria</i> ).	Site value	No direct impact is anticipated, however inadvertent damage to this habitat could potentially occur during the construction phase of the development.
Scattered Broadleaved and Coniferous Trees (A3.1 and A3.2)	Numerous scattered broadleaved and coniferous trees are present throughout the site. These trees vary in age and include both native and non-native species including ash ( <i>Fraxinus excelsior</i> ), horse chestnut ( <i>Aesculus hippocastanum</i> ), Leyland cypress ( <i>Cupressocyparis leylandii</i> ) and cherry ( <i>Prunus sp.</i> ) (Photo 2).	Site value	The majority of the scattered trees are proposed for retention, however three of the ash trees (T2 and G1) are suffering from ash dieback, so are likely to be felled. Felling of these trees may result in direct adverse impacts to birds nesting within these habitats, including the loss of potential nesting sites. Recommendations to avoid and mitigate such impacts are presented in Section 4.
Tall Ruderal Vegetation (C3.1)	<p>Tall ruderal vegetation is present across a large majority of the site, including the eastern part and peripheral areas. Common nettle (<i>Urtica dioica</i>) is dominant, with abundant cleavers (<i>Galium aparine</i>) and creeping buttercup (<i>Ranunculus repens</i>). Other frequent species include scaly male-fern (<i>Dryopteris affinis</i> agg) and bracken (<i>Pteridium aquilinum</i>).</p> <p>The habitat to the west of the site consists of a wet community, with species present typical of shady and riparian habitats, such as greater pond sedge (<i>Carex riparia</i>). Wood avens (<i>Geum urbanum</i>), hogweed (<i>Heracleum sphondylium</i>) and garlic mustard (<i>Alliaria petiolata</i>) are also frequent along the western boundary, as well as occasional greater stitchwort (<i>Stellaria holostea</i>).</p>	Site value	Clearance of the site to facilitate the new development will result in the permanent loss of areas of this habitat.
Running Water (G.2)	Old Engine Brook flows from north to south along the western boundary of the survey area (Photos 1, 3-5). This stream is fed by a smaller brook which forms the northern boundary of the survey area. The water is of good quality and moderate depth, with numerous boulders/rocks present. The banks of the brook are well vegetated. Aquatic plant species include Mare's tail ( <i>Hippuris vulgaris</i> ).	Qualifies as Section 41 and LBAP habitat via the presence of various Annex II Habitats Directive species, priority and non-priority species.	The proposed works could adversely affect the ecological integrity of Old Engine Brook via indirect impacts such as pollution or sediment deposits associated with construction works and site waste. These impacts may move downstream and thus affect areas beyond the immediate zone of influence. However, such an occurrence can be adequately avoided by the

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			implementation of pollution prevention measures, as set out in Section 4.
Spoil (I2.2)	<p>Two spoil heaps are present to the east and west of the survey area (Photos 6-7). The spoil consists of earth piles which grade into surrounding tall ruderal vegetation.</p> <p>A large stone pile is situated to the southwest of the survey area, while a large pile of metal sheets and various other materials lies to the west, adjacent to the scattered coniferous trees.</p>	Site value	The earth heaps will be permanently cleared. It is not clear from the proposals whether the stone and metal sheet piles will be affected by the development. However, it is considered likely that they will be dismantled, thereby resulting in the loss of potential refugia for sheltering wildlife, such as reptiles and GCN (see Sections 3.4.5 and 3.4.10).
Intact Species-Rich Hedgerow (J2.1.1)	<p>The northern and eastern boundaries of the site are marked by an intact species-rich hedgerow (Photos 8-9). The hedgerow is tall and largely outgrown, due to lack of management. The dominant species are common hawthorn (<i>Crataegus monogyna</i>) and hornbeam (<i>Carpinus betulus</i>). Sycamore (<i>Acer pseudoplatanus</i>), plum (<i>Prunus domestica</i>) and holly (<i>Ilex aquifolium</i>) are also present.</p> <p>Ground flora species include cleavers, lords and ladies (<i>Arum maculatum</i>) and false brome (<i>Brachypodium sylvaticum</i>), as well as bluebell (<i>Hyacinthoides non-scripta</i>), an ancient woodland indicator.</p>	Section 41 habitat	Whilst the hedgerows on site are proposed to be retained, it is likely that the proposed development will result in a degree of increased anthropogenic disturbance during both construction and operational phases. There is also a risk that the hedgerows could be inadvertently damaged during the construction phase. Trees in the hedgerow may be subject to root damage as a result of heavy plant movement over the root protection area, or accidental damage during general construction activities. Recommendations to avoid and mitigate such impacts are presented in Section 4.
Himalayan Balsam <sup>13</sup>	Significant stands of Himalayan balsam are spread across the survey area. Much of this species has not been specifically mapped; however, the approximate location of large stands is shown in Plan 4.	See Section 3.3	See Section 3.3
Buildings (J.3.6)	A derelict building (Building 1) is located along the western boundary of the site, adjacent to the stream (Photo 11). The building is of single-skin, red brick construction. The structure lacks a roof and has become overgrown with vegetation. Building 2 is situated to the east of the site, adjacent to the peripheral hedgerow. It is a partially built structure with a modern timber design (Photo 12).	Site value	Building 1 will be permanently cleared. It is currently unclear whether Building 2 will comprise a permanent feature of the development, or whether it is a temporary storage structure.

<sup>13</sup> Habitat not included within the Phase 1 Handbook (JNCC 2010)

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Bare Ground (J.4)	An area of bare ground occupies the central part of the survey area. Nettle, bramble ( <i>Rubus fruticosus</i> agg), hedge bindweed ( <i>Calystegia sepium</i> ) and great willowherb ( <i>Epilobium hirsutum</i> ) are present.	Negligible value	The bare ground will be permanently lost to development.
Hard Standing <sup>13</sup>	Hard standing is present at the southwestern part of the survey area.	Negligible value	The hard standing will be permanently lost to development.

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## Photos of On-site Habitats

Photo 1: Dense scrub along banks of stream (Old Engine Brook)



Photo 2: Scattered broadleaved and coniferous trees (ash and Leyland cypress)



Photo 3: Stream at western site boundary



Photo 4: Stream at western site boundary



Photo 5: Stream at western site boundary



Photo 6: Spoil



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Photo 7: Spoil and tall ruderal vegetation



Photo 8: Intact species-rich hedgerow (northern boundary)



Photo 9: Intact species-rich hedgerow (northern boundary)



Photo 10: Intact species-rich hedgerow (eastern boundary)



Photo 11: Building 1



Photo 12: Building 2



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Photo 13: Bare ground and tall ruderal vegetation



Photo 14: Stone pile



Photo 15: Metal sheet pile



Photo 16: Hard standing



### 3.3. Assessment of Impacts of Invasive Species

#### Presence of Himalayan Balsam on Site

There are significant stands of Himalayan balsam, a Schedule 9 invasive plant species, largely present along the banks of the watercourse at the western and northern boundaries. The presence of Himalayan balsam is having a significant negative effect on the biodiversity value of the site.

#### Assessment of Potential Development Impacts

Several key observations are made:

- If left unmanaged, the Himalayan balsam will continue to spread across the site, resulting in a severe reduction in species richness and biodiversity;
- If not managed correctly, the proposed development is likely to result in the further spread of Himalayan balsam, either through the accidental distribution of soils containing seeds during earthworks and haulage etc., or simply via careless work practices which can accidentally result in spreading of the seeds. Seeds can be easily spread by simply brushing against the plants, triggering the explosive seed pods to eject their seeds;

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- The immediate spread of this species must be prevented through the implementation of appropriate mitigation measures; and
- The long-term eradication of Himalayan balsam from the site and ongoing management is essential to preserve the sites biodiversity. While the complete eradication of Himalayan balsam may not be possible, there must be ongoing management action so that plants do not recolonise too much of the site (see Section 4.4.1).

## **3.4. Protected and Notable Species**

### **3.4.1. Notable Plant Species**

#### Data Trawl Results

GCER provided no records of protected plant species or species of principal importance listed under Section 41 list in England of the NERC Act (2006) from within 1km of the site proposed for development.

#### Field Survey Results

No plant species, which individually are considered to be of either of national, regional or local significance were recorded on the site.

### **3.4.2. Birds**

#### Desk Study Results

The following table shows nesting birds and wintering birds of note recorded within 1km of the site, that are also associated with the habitats present on-site and their conservation status:

#### Table 4: Records of Birds

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Species		Schedule 1	NERC S41 - (English Sites, species of principal importance)	UK BAP	Red list <sup>14</sup>	Amber list <sup>15</sup>	Breeding Habitat <sup>16</sup>	Wintering Habitat
Bullfinch	<i>Pyrrhula pyrrhula</i>		Yes	Yes			Deciduous woodland, thickets, gorse and detached groups of trees, mostly in lowlands	As breeding habitat, plus greater use of farmland, scrub, orchards and large gardens
Cuckoo	<i>Cuculus canorus</i>		Yes	Yes	Yes		Woodland and scrub, parkland, hedgerows, wetlands with reedbeds, heaths, coastal dunes and marshes	Not applicable
Dipper	<i>Cinclus cinclus</i>					Yes	Beside or on swift running streams and rivers of mountainous, hilly and lowland regions.	As breeding habitat
Dunnock	<i>Prunella modularis</i>		Yes	Yes		Yes	Scrubland, woodland, field hedgerows, suburban parks and gardens	As breeding habitat
Goshawk	<i>Accipiter gentilis</i>	Yes					Extensive coniferous or broadleaved woodlands, with some open country	As breeding habitat
House sparrow	<i>Passer domesticus</i>		Yes	Yes	Yes		Agricultural land, grasslands, hedgerows, scrub, parks, gardens and farmyards	As breeding habitat

<sup>14</sup> Bird species of high conservation concern, such as those whose population or range is rapidly declining, recently or historically, and those of global conservation concern.

<sup>15</sup> Bird species of medium conservation concern, such as those whose population is in moderate decline, rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.

<sup>16</sup> Breeding and wintering habitat descriptions from Key Habitat Attributes for Birds and Bird Assemblages in England Part 1 (ENRR359)

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Kestrel	<i>Falco tinnunculus</i>		Yes			Yes	Widespread and diverse including grasslands, moorland, heathland, open woodland, forestry plantations, farmland and urban	As breeding habitat
Kingfisher	<i>Alcedo atthis</i>	Yes					Slow-flowing rivers, canals, lakes, ponds and flooded gravel pits	As breeding habitat, plus estuaries, harbours and seashores
Linnet	<i>Linaria cannabina</i>			Yes	Yes		Gorse heath, shrubby thickets, farmland hedges, orchards, uncultivated fields, young plantations, gardens and industrial wasteland	As breeding habitat, but increases use of farmland and resorting to saltmarsh, shingle banks and sand dunes
Marsh tit	<i>Poecile palustris</i>		Yes			Yes	Deciduous woodland and forest, alder carr, belts of riparian trees, orchards, gardens and parks	As breeding habitat
Meadow pipit	<i>Anthus pratensis</i>					Yes	Saltmarsh, flood meadow, chalk grassland, lowland heath, grazed fen and bog, uplands and young conifer plantations	Sewage works, wetland margins, saltmarsh, plough, rough pasture and crops
Redstart	<i>Phoenicurus phoenicurus</i>			Yes		Yes	Woods, parkland, heaths, orchards, gardens, stream side trees	N/A
Song thrush	<i>Turdus philomelos</i>		Yes	Yes	Yes		Woodland, parkland, hedgerows, scrubby grassland and gardens	As breeding habitat except woodlands are mostly vacated
Spotted flycatcher	<i>Muscicapa striata</i>		Yes	Yes	Yes		Open deciduous or mixed woodlands with glades and clearings,	N/A

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							parkland, gardens and riversides	
Starling	<i>Sturnus vulgaris</i>		Yes	Yes	Yes		Farmland, woodland and suburban habitats	As breeding habitat
Stock dove	<i>Columba oenas</i>					Yes		
Tree pipit	<i>Anthus trivialis</i>		Yes	Yes	Yes		Heathland or grassland with low scrub, mature hedgerows and open ash, oak or pine woods or young conifer plantations	N/A
Turtle dove	<i>Streptopelia turtur</i>			Yes	Yes			
Willow tit	<i>Poecile montanus</i>		Yes	Yes	Yes		Alder carr, stream-side woodland and scrub, woods surrounding gravel pits and reservoirs and lowland coniferous woodland	As breeding habitat
Willow warbler	<i>Phylloscopus trochilus</i>					Yes	Young woodlands, scrub, woodland edges, rides and clearings and young conifer	N/A

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## Field Survey Results

A moderate number of birds were recorded on site, including chiffchaff (*Phylloscopus collybita*), dunnock, goldfinch (*Carduelis carduelis*), great tit (*Parus major*), magpie (*Pica pica*), robin (*Erithacus rubecula*) and willow warbler.

No nests or signs of nesting behaviour were recorded on site.

## Assessment of Ecological Value of Site for Birds

The peripheral hedgerows, scattered trees and dense scrub provide nesting and foraging opportunities for a range of tree and scrub nesting bird species, including UK BAP and Red List species such as kestrel, cuckoo, spotted flycatcher, song thrush and starling which have been recorded in the wider area. Furthermore, the watercourses provide suitable habitat for riparian birds including kingfisher, a Schedule 1 species which has been recorded in close proximity to the site.

As a whole, the site is considered to be of local value to birds. It contains individual features that provide moderate foraging and nesting habitats for a range of species; however, these features are widespread and common in the surrounding landscape.

## Impact Assessment of Proposed Development on Birds

The proposed works may result in the direct loss of, or disturbance, to nesting birds. Felling of any of the scattered broadleaved trees will result in the loss of foraging and potential nesting sites that could be utilised during the breeding season (March to August inclusive). Development proposals indicate that there will be no losses to the hedgerows or scrub within the site, which would have resulted in the loss of high-quality bird nesting and foraging habitat. However, if undertaken during the breeding season, any building work and vegetation clearance associated with the proposed works could result in direct disturbance to birds nesting within these habitats. Recommendations to avoid and compensate for such impacts are included in Section 4.

### **3.4.3. Bats**

## Desk Study Results

The data search returned a total of nineteen records of bat roosts within 1km of the site. The roost records are summarised in the table below.

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Table 5: Bat Roost Records

Species	Total Number of Records	Distance to Nearest Record	Most Recent Record
Common pipistrelle ( <i>Pipistrellus pipistrellus</i> )	1	0.5km	2016
Soprano pipistrelle ( <i>Pipistrellus pygmaeus</i> )	1	0.5km	2016
Lesser horseshoe	14	0.7km	2019
Greater horseshoe	1	0.7km	2011
Brown long-eared	2	0.6km	2016

In addition to the roost records, GCER returned many records of bats foraging or commuting within 1km of the site. These included the above species as well as Daubenton's bats (*Myotis daubentoni*), Natterer's bats, noctule (*Nyctalus noctula*), Barbastelle (*Barbastellus barbastellus*) and whiskered bats (*Myotis mystacinus*).

The following European Protected Species Mitigation Licences (EPSMLs) were granted within a 2km radius of the site:

Table 6: Granted Bat EPSMLs within 2km of the Site

Case Reference of Granted Application	Approx. Distance from Site	Species Affected	Licence Start Date	Licence End Date	Impacts Allowed by Licence
EPSM2012-5254	1.1km	Common pipistrelle Brown long-eared	2013	2023	Destruction of a resting place
2016-23768-EPS-MIT	1.8km	Common pipistrelle Whiskered bat	2016	2021	Destruction of a resting place

## Field Survey Results

### **Trees**

All of the trees within the survey area were assessed for their suitability to support roosting bats. The majority of scattered trees were young with no PRFs. However, the hedgerow that forms the northern and eastern boundaries of the site contains several semi-mature trees which have been assessed as having low potential to support roosting bats.

### **Foraging and Commuting Habitat**

While the areas of bare ground, spoil and tall ruderal vegetation are suboptimal for bats, the peripheral hedgerows and tree-lined watercourses providing ample foraging opportunities and contribute to linear habitat features that could be utilised by commuting bats.

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## Assessment of Ecological Value of Site for Bats

### ***Potential Tree Roosts***

The hedgerow that forms the northern and eastern boundaries of the site contains multiple semi-mature trees, which have been assessed as having low potential to support roosting bats. However, with the exception of three ash trees, all of these trees are proposed for retention and appropriate tree protection zones have been advised in the tree report (see Plan 5).

### ***Potential Foraging and Commuting Habitat***

The site is collectively considered to provide high quality foraging and commuting habitat for bats, due to the presence of continuous high-quality habitat including hedgerows and tree-lined watercourses. These features are likely to be utilised regularly by foraging and commuting bats and form a continuous habitat corridor that is well connected to suitable habitat in the wider landscape, including extensive areas of woodland. Furthermore, there are numerous records of bat roost and bats in the local area which may utilise the habitats on site. These include records of lesser and greater horseshoes, brown long-eared and Barbastelle bats, which are all listed as priority species under the NERC 2006 Act.

## Impact Assessment of Proposed Development on Bats

The ash trees that are likely to be felled are all young and have negligible potential to support roosting bats. The hedgerows and remaining scattered trees are proposed for retention and will remain intact along with their function as linear habitat features. Direct adverse impacts to bats are therefore considered unlikely. However, the numerous semi-mature trees, that have low potential to support roosting bats, could be inadvertently damaged during construction activities. Protective barriers must therefore be installed prior to any site work, as detailed in Section 4.

Furthermore, increased lighting during the construction and operational phases of the development may negatively impact 'light-sensitive' horseshoe species foraging and commuting on the northern and eastern hedgerows of the site. A sensitive lighting strategy must therefore be developed, as detailed in Section 4.

### **3.4.4. Dormice**

#### Desk Study Results

GCER did not return any published records of dormice from within 1km of the site (GCER data 2021).

#### Field Survey Results

No signs or evidence of dormice were recorded during the survey. The main proposed works area comprises tall ruderal vegetation and bare ground which is wholly unsuitable for dormice. However, the peripheral hedgerows on site provide opportunities for aboreal movement of dormice and contain several fruiting and flowering species which may provide suitable food sources, including ash, common hawthorn, hornbeam,

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sycamore and cherry. Furthermore, these hedgerows are well connected to extensive areas of ancient woodland, located within 50m of the site, to the east.

## Assessment of Ecological Value of Site for Dormice

The hedgerows that form the northern and eastern boundaries contain a number of food plants known to form part of the dormice diet and provide opportunities for aboreal movement of this species. However, the hedgerows lack hazel, the favoured food plant of dormice, and are largely outgrown with limited structural diversity in the understorey. These factors reduce the suitability of the site for dormice. Furthermore, the desk study did not return any records of dormice within the local area. However, since the site is well connected to optimal habitat in the wider landscape, including large areas of ancient woodland, the presence of dormice within the peripheral hedgerows cannot be ruled out.

## Impact Assessment of Proposed Development on Dormice

The peripheral hedgerows provide moderate quality dormouse habitat. However, these hedgerows are proposed for retention and the anticipated works area towards the centre of the site is considered to be wholly unsuitable for use by dormice. Direct adverse impacts to dormice are therefore considered to be unlikely. However, direct impact could feasibly occur through accidental damage to the hedgerows during construction, as well as indirect impacts, including increases in noise disturbance, vibrations and artificial lighting. Precautionary measures to avoid such impacts are set out in Section 4.

### **3.4.5. Great Crested Newt**

#### Desk Study Results

The data search returned 105 GCN newt records within 1km of the site. Most of these were recorded in Steam Mills, approximately 0.28km to the south of the development site. The most recent record was made in 2018.

There are records of other amphibians, comprising one record of common toad (*Bufo bufo*), five records of palmate newt (*Lissotriton helveticus*) and six records of smooth newt (*Lissotriton vulgaris*). The nearest record is of a common toad 0.8km to the south-west, made in 2019.

#### Field Survey Results

No direct observation or evidence of great crested newts was recorded on site, although a targeted survey was not undertaken for this species.

#### ***Aquatic Habitat***

The HSI assessment of the potentially suitable waterbody within 0.5km of the site is displayed in the following table. The location of the water body is shown in Plan 6.

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Table 7: Pond 1 HSI Scores

Pond Reference	Water Body 1
SI1 Field location	1
SI2 Pond area	0.3
SI3 Pond drying	0.9
SI4 Water quality	1
SI5 Shade	1
SI6 Fowl	0.67
SI7 Fish	0.67
SI8 Ponds	0.65
SI9 Terrestrial habitat	1
SI10 Macrophytes	0.8
<b>HSI SCORE:</b>	<b>0.76</b>
<b>Pond Suitability:</b>	<b>Good</b>

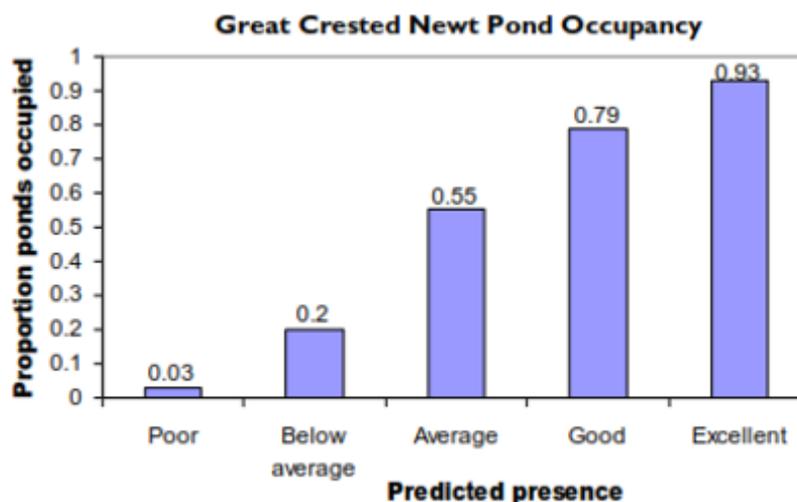
The results of the Habitat Suitability Index indicate that Pond 1 has 'good' potential to support breeding GCN. The good score of Pond 1 is mainly attributed to the suitability of the surrounding terrestrial habitat, the reduced shade and high abundance of aquatic vegetation.

## Terrestrial Habitats

During the terrestrial stage of their lifecycle, great crested newts can make use of a range of habitats including woodland, hedgerows, scrub and rough grassland for foraging, shelter and hibernation. The terrestrial habitats within the development footprint provide a mosaic of optimal and sub-optimal habitats for GCN. The hedgerows and tall ruderal vegetation could be utilised by migrating, foraging and hibernating individuals. Additionally, the stone pile and metal sheet pile provide potential refugia and hibernation sites for GCN. The hard standing, bare ground and spoil habitats are considered to be of negligible value to GCN, providing little physical protection for this species.

## Assessment of Ecological Value of Site for Great Crested Newt

The results of the HIS assessment indicate that Pond 1 has 'good' potential to support GCN. The figure below (ARG, 2010) shows that the proportion of GCN presence in ponds that scored 'good' is 0.79 or 79%.



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Pond 1 is located in close proximity to the proposed development site, within the grounds of the adjacent property to the north. The terrestrial habitat that links Pond 1 to the site is favourable for GCN, providing ample cover from predation and hibernation opportunities in the varied vegetation. The tall ruderal vegetation, hedgerows and stone and metal sheet piles are likely to form important habitats for GCN (if present). The small brook that forms the northern boundary, separating Pond 1 from the site, is unlikely to present a barrier to great crested newt dispersal due to its small size and limited velocity.

If great crested newts are present in Pond 1, it is possible that they could occur within the proposed development site. Furthermore, several additional ponds are situated >500m of the survey area. These include ponds within Steam Mills LWS, a site designated for its high-quality wetland habitats, situated approximately 0.28km from the proposed development site. A high number of GCN records have been found within this designated site.

## Impact Assessment of Proposed Development on Great Crested Newt

The risk assessment tool (Table 8) suggests that, supposing Pond 1 is used by breeding GCN, an offence (including killing, injury, disturbance, destruction or damage to a resting place or obstruction of access to a resting place) is highly likely to occur as a result of the proposed works. Therefore, it is necessary to carry out additional surveys to establish presence/likely absence of GCN. Detailed recommendations are provided in Section 4.

Table 8: Rapid Risk Assessment for GCN

Component	Likely effect	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.5
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	0.1 - 0.5 ha lost or damaged	0.005
Individual great crested newts	Significant disturbance of newts	0.8
	Maximum:	0.8
Rapid risk assessment result:	<b>RED: OFFENCE HIGHLY LIKELY</b>	

### 3.4.6. Otter

#### Desk Study Results

GCER did not return any records of otter from within 1km of the site.

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## Field Survey Results

No evidence of otter was identified from Old Engine Brook; however, it remains highly likely that otters forage/and or commute along this watercourse, at least periodically. The banks of the watercourse are well vegetated and some exposed tree roots are present, which could potentially be used by otters as resting places (i.e. couches or holts).

## Assessment of Ecological Value of Site for Otters

The watercourse on site is considered to be of moderate value to otters, due to the abundance of suitable habitat features. There are multiple instances of overhanging vegetation, tree roots and bankside vegetation, including areas of dense scrub, which could feasibly provide cover and holting opportunities. The well-vegetated banks provide suitable locations for couches. This watercourse also provides suitable foraging and commuting habitat for otters; however, the small brook that forms the northern boundary has reduced foraging potential compared to the stream at the western boundary, due to the limited amount of water. The main proposed works area is largely unsuitable for otters due to a lack of suitable habitat, limited cover and foraging opportunities.

## Impact Assessment of Proposed Development on Otter

The presence of otters along the on-site watercourse cannot be ruled out. Otters are very sensitive to disturbance and the proposed works may result in negative impacts through noise, accidental damage, human disturbance and lighting. Furthermore, any works which may cause increased sedimentation and/or water inputs into the stream/brook may indirectly affect otters and other aquatic animals, including otter prey such as eels. Disturbance and loss of holts, couches and foraging grounds may result in isolation of populations on either side of a possible development.

An update otter inspection will be required prior to commencement of works, as detailed in Section 4.

### **3.4.7. Water Vole**

#### Desk Study Results

GCER did not return any records of water vole from within 1km of the site.

#### Field Survey Results

No water voles, or signs of water vole were recorded along the banks of Old Engine Brook, although a full targeted survey was not undertaken. The banks are superficially suitable for burrowing by this species, although no such evidence was recorded during the survey. A range of optimal to suboptimal terrestrial habitats suitable for water voles are present along the banks of the watercourse, including more open grassy areas that provide suitable foraging opportunities and more densely vegetated/shrubby areas. The habitats within the anticipated works area are unsuitable for water voles, containing no suitable waterbodies or vegetative cover.

## Assessment of Ecological Value of Site for Water Voles

The presence of water voles cannot be ruled out completely. While no records of water vole were returned by the data search, the habitats along the on-site watercourse contain a diverse structure of vegetation, providing ample cover for water voles. Furthermore, these habitats are well connected to other suitable watercourses in the wider landscape.

## Impact Assessment of Proposed Development on Water Voles

Potential adverse impacts to water voles could occur through disturbance to potential resting places and foraging grounds, as well as habitat degradation via increased sedimentation and/or water inputs into the watercourse. Recommendations to avoid such impacts are outlined in Section 4.

### **3.4.8. White-Clawed Crayfish**

#### Desk Study Results

GCER did not return any records of WCC from within 1km of the site.

#### Field Survey Results

No WCC were recorded within Old Engine Brook; however, it has some features favoured by this species. The large cobbles and sections of ballast on the bed offer potentially suitable refuges and the surveyed section of stream appears to have good water quality. The small brook that forms the northern boundary is less suitable for WCC due to the relatively shallow water depth.

## Assessment of Ecological Value of Site for WCC

WCC are typically found in watercourses of 0.75m to 1.25m deep, although they may occur in very shallow streams (around 5cm) and in deeper, slow-flowing rivers (up to 2.5m) (Holdich, 2003). Old Engine Brook contains a number of features associated with capability to support WCC, including sections of ballast and cobbles, as well as overhanging banks that provide refuges for this species. However, the relatively high velocity of the water flow reduces the suitability of this watercourse for WCC. The remaining habitats on site are of negligible value to this species.

## Impact Assessment of Proposed Development on WCC

The presence of WCC within Old Engine Brook cannot be ruled out completely. Direct adverse impacts to this species are considered unlikely to occur as a result of the proposed works. However, indirect adverse impacts may occur, including damage to crayfish gills and a reduction in the number of refuges as a result of increased silt loads. Recommendations to avoid such impacts are presented in Section 4.

## **3.4.9. Badgers**

### Desk Study Results

GCER did not return any records of badgers from within 1km of the site.

### Field Survey Results

No setts or other signs of badgers were recorded on site. The presence of badgers as a resident species on site was assessed as being unlikely due to the absence of any obvious signs. Furthermore, the site is mainly level and open in nature making it generally unsuitable for sett building. However, the boundary hedgerows and tall ruderal vegetation provide suitable foraging habitat for badgers.

### Assessment of Ecological Value of Site for Badgers

Although no evidence of badgers was recorded on site, there is considered to be some potential for them to venture onto the site from the surrounding landscape to forage sporadically.

### Impact Assessment of Proposed Development on Badgers

As badgers are nocturnal, it is considered unlikely that any foraging or commuting badgers will be encountered on site during works. Considered in addition to the absence of any obvious signs of badger presence and the lack of local records, the likelihood of adverse impacts to this species is negligible. Good construction practices are recommended in Section 4 to ensure that no badgers moving through the site are injured during the construction phase of the development.

## **3.4.10. Reptiles**

### Desk Study Results

The data search returned 14 records of reptiles within 1km of the site (GCER data 2021). These included three records of slow worm (*Anguis fragilis*), two records of grass snake (*Natrix natrix*), three records of adder (*Vipera berus*) and six records of common lizard (*Zootoca vivipara*). The nearest record was made in 2014, 0.7km to the south-west.

### Field Survey Results

No direct evidence of reptiles was recorded on site. However, the site is considered to provide moderate quality reptile habitat. Unlike some species, the precise floristic composition of habitats is often irrelevant to reptiles. Instead, the site's physical structure and thermal properties are more important (Edgar *et al.* 2011). The tall ruderal vegetation and bare ground/spoil interfaces provides suitable habitat for reptiles. The dense vegetation provides protective cover for reptiles, whilst the bare ground provides basking opportunities. The boundaries of the site also offer important interfaces, such as between the tall ruderal vegetation and hedgerows/scrub, as well as the marshy riparian habitats. The stone pile and metal sheet pile to the west of the site provide suitable refugia and hibernation opportunities for reptiles (Photo 14-15).

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Furthermore, the adjacent field to the south of the proposed development site offers high quality reptile habitat. Tussocky vegetation and bracken offer varying sward heights, providing opportunities for shelter, basking and foraging (Photos 17-18).

Photo 17: Off-site habitat



Photo 18: Off-site habitat



## Assessment of Ecological Value of Site for Reptiles

The site is considered to provide moderate quality reptile habitat. It contains a mosaic of habitats that could be utilised by reptiles and several published records exist in proximity to the site. Prior to recent clearance of some area, the site is considered likely to have provided high quality reptile habitat and it is therefore possible that the site supports residual populations of these species.

## Impact Assessment of Proposed Development on Reptiles

The proposed works will result in the complete loss of potential reptile habitat. Clearance of vegetation may therefore result in the accidental killing or injury of reptiles. Recommendations for further work are outlined in Section 4.

### **3.4.11. Other Mammals**

#### Desk Study Results

GCER returned one record of common hedgehog (*Erinaceus europaeus*) within 1km of the site. The record was made in 2015 0.4km to the south-east.

#### Field Survey Results

It is highly likely that a range of common small mammals are present on the site, including hedgehogs (*Erinaceus europaeus*), shrews (*Sorex sp*), voles (*Microtus/Myodes sp.*), mice (*Apodemus sp*), fox (*Vulpes vulpes*) and mole (*Talpa europaea*) etc., occurring either as resident species or whilst foraging and/or commuting. The hedgerows, scrub and stone/metal-sheet piles are considered to provide optimal refugia for day-resting hedgehogs and hibernacula during the winter months.

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## Assessment of Ecological Value of Site for Other Mammals

Hedgehogs are considered likely to forage within the site and could potentially nest and hibernate within the peripheral habitats. The loss of or damage to these habitats could lead to negative impacts upon this species, if present.

## Impact Assessment of Proposed Development on Other Mammals

The impact of the proposed development on potential hedgehog habitat is considered to be relatively low. The peripheral habitats which are suitable for hedgehogs are proposed for retention; however, any clearance of grassland or unintentional damage to the hedgerows, scrub or stone/metal sheet piles during construction, may result in the accidental killing or injury of hedgehogs. Mitigation measures to avoid such impacts are provided in Section 4, as well as recommendations for habitat enhancement for this species.

## 4. Recommendations and Conclusions

The following recommendations have been developed based on the development proposals available at the time of writing. The implementation of these recommendations will ensure compliance with the National Planning Policy Framework (2019)<sup>17</sup>, the Conservation of Habitats and Species (Amendment) (EU Exit) [CHSAEU] Regulations 2019 and help to avoid or minimise adverse impacts on the environment and protected species, mitigate and compensate for losses where damage is unavoidable and promote opportunities to enhance biodiversity. There is a requirement that developments must provide net benefit for biodiversity.

### 4.1. Further Work

Works will not commence until the surveys below have been carried out. Results from these surveys will inform and allow for targeted recommendations for the avoidance (timing of works), future mitigation and compensation measures required as part of the development and determine if any protected species derogation licences are required.

#### 4.1.1. Great Crested Newt eDNA Survey

A GCN presence/likely absence survey of Pond 1 is recommended. This will be dependent on attaining access permission from the relevant landowner(s). This is in line with Natural England's survey guidance (Natural England, 2015), which in this case is for a project that:

- will cause temporary habitat loss/damage;
- is located between 50m and 100m of the nearest pond; and
- has a working area between 0.05ha and 0.5ha.

It is recommended, therefore, that the Pond 1 is subject to an Environmental DNA (eDNA) assessment, which will determine GCN presence/likely absence. This assessment can be carried out between 15<sup>th</sup> April and 30<sup>th</sup> June and involves samples of water being taken from the pond and subsequently sent off for laboratory analysis.

If the eDNA result is positive, a full survey to determine the population class will be required. The survey would involve six surveys between mid-March and mid-June, of which at least three should be scheduled between mid-April and mid-May. Each survey should use a range of survey methods (torch survey, netting, bottle trapping, and searching for newt eggs).

If GCN are confirmed, Table 8 in Section 3.4.5. has indicated that an offence is highly likely to be committed as works will likely involve damage to potentially suitable terrestrial habitat for GCN. Consequently, a European Protected Species Mitigation Licence from Natural England is likely to be required.

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<sup>17</sup> Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions ... and in so doing promote the resilience of ecosystems. Development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.

If access to Pond 1 cannot be arranged, further work for GCN will be limited to the terrestrial-phase surveys described in Section 4.1.2, and therefore a precautionary approach will be adopted.

## **4.1.2. Reptile and Terrestrial-Phase Great Crested Newt Survey**

Works should not commence until further surveys have been carried out to assess the potential impact to reptiles and terrestrial-phase great crested newts on site.

Surveys to determine the presence/ likely absence of reptiles and terrestrial-phase great crested newts should be carried out between mid-July to mid-October (inclusive). This timeframe will ensure that any breeding great crested newts will have left their breeding ponds and will be present within terrestrial habitats of the site. The survey will follow the advice provided by the Herpetofauna Workers' Manual (Gent and Gibson, 2003), and comprise a 'direct search' and the monitoring of artificial and naturally occurring refugia placed in areas of the site assessed as being most attractive to reptiles (e.g. longer grass, scrub margins etc.).

A variety of different types of refugia should be used. Refugia will comprise primarily squares of roofing felt, carpet tiles and/ or corrugated metal tins of varying sizes but mainly 60 x 60cm. Naturally occurring refugia including discarded logs, timber and large rocks etc. will also be checked. Where possible, artificial refugia should be laid in south-facing positions in areas deemed least likely to be tampered with. Refugia will be left undisturbed on site for two weeks, prior to commencement of the survey to allow the reptiles and/ or newts on the site sufficient time to find and start utilising them. The refugia will then be checked on at least seven separate occasions, non-consecutively, in suitable weather conditions (warm, overcast periods with low wind speeds) in order to record any reptile species beneath or basking upon them. As a guideline, it is recommended that the optimal time to survey reptiles is between 08:30 and 11:00 or 16:30 and 19:00, and when the air temperature is between 9°C and 18°C<sup>18</sup> (Froglife, 1999). Strong rain and wind are deemed unsuitable for surveying reptiles (Froglife, 1999). Ideally, the survey will be spread out across the survey season.

The survey results will determine whether reptiles or great crested newts are present on the site, and if so will provide the basis for designing and implementing a reptile mitigation strategy prior to the start of the development. Depending on the population present it may be possible for individuals to be encouraged to move offsite voluntarily via species deterrence measures and destructive searches.

If great crested newts are encountered, a suitable qualified ecological consultant or Natural England must be consulted. If necessary, a derogation licence will be obtained before work can resume.

## **4.1.3. Update Otter Inspection**

Prior to the commencement of any site works, an update site inspection will be undertaken for otters along the course of Old Engine Brook, up to 150m upstream and downstream of the area proposed for development, as well as along the small brook. If evidence of otters or holts are recorded, appropriate

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<sup>18</sup> Natural England's Reptile Mitigation Guidelines recommend that the temperature is between 10-20°C.

buffer zones may be required to ensure disturbance does not occur. Where possible, the update inspection will also search for signs of other animals such as water voles to ensure that impacts to other species can be adequately avoided. Additional measures are set out below.

#### **4.1.4. CEMP**

Due to the sensitivity of the watercourse, a Construction Environmental Management Plan (CEMP), will be produced prior to commencement of the proposed development works. This will include pollution prevention measures, as set out in Section 4.2.3.

## **4.2. Precautionary Measures**

### **4.2.1. Timing of Works**

Full details of timing of works will be determined after the completion of the further survey outlined in Section 4.1.1.

### **4.2.2. Protective Measures for Retained Habitats**

To prevent accidental damage, the retained hedgerows, scattered broadleaved trees and watercourse will be securely fenced-off with appropriate temporary fencing (e.g. Herra's fencing), and treated in accordance with British Standard BS5837 (2012) Trees in Relation to Design, Demolition and Construction – Recommendations. This protective fencing will be established in line with the tree root protection zones, as detailed in the arboriculture report that has been produced for the site. Fences will be erected prior to the commencement of works and will be left in place until development completion. They will create an ecological buffer that will negate adverse impacts to the adjacent watercourse, while also providing a degree of ecological enhancement to the site (see Section 4.4). Where possible, any future developments will avoid felling of trees and clearance or breaching of the hedgerows. This will help to maintain the ecological connectivity of the site, maintain its biodiversity value and reduce the potential requirements for further protected species or breeding bird surveys.

### **4.2.3. Pollution Prevention Measures for Watercourses**

Appropriate pollution control measures, both during construction and post construction, will be employed to protect the water quality of Old Engine Brook. Surface water/pollutant run-off into any watercourses will be avoided during site preparation and construction practices. It is advisable that this is detailed within a Construction and Environmental Management Plan<sup>19</sup> (CEMP), conditioned as part of the planning consent.

The measures to be implemented are partly outlined in the Environment Agencies guidance document 'Working at construction and demolition sites: PPG6 Pollution Prevention Guidelines<sup>20</sup> and 'Guidance for

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<sup>19</sup> The CEMP should consider the list of issues and activities listed within BS 42020:2013, Clause 10.

<sup>20</sup> Available online at <http://bit.ly/1K1117H>. Note these guidelines were withdrawn on the 14th December 2015 but are still considered relevant.

Pollution Prevention Works and maintenance in or near water: GPP 5'. These include the following measures:

## Works Compounds

Works compounds will not be sited immediately adjacent to the stream or brook on site.

## Spill Response

If an accidental spill occurs on site, a quick response is needed to contain the spilled material (e.g. fuel, hazardous material etc.). Spill kits and a staff induction will be provided prior to the start of works so that a quick response by staff on site is ensured if a spill occurs.

## Silt/Run-off Prevention

Many construction processes produce silty water: movement and maintenance of plant and vehicles on site, rainwater run-off from exposed ground, trenches or foundations, wheel and boot wash facilities etc. The following measures could, if required, be implemented on site to prevent the creation of silty water and silt run-off into the watercourse:

- Plan ahead for intense and prolonged wet weather;
- Minimise the amount of time stripped ground and soil stockpiles are exposed;
- Only remove vegetation from the area that needs to be exposed in the near future;
- Seed or cover stockpiles;
- Use geotextile silt fencing along the banks of the watercourse, to reduce the movement of silt. This should be installed before soil stripping has begun and vehicles start tracking over the site;
- Run-off could, if required, be collected in a sump or collected in lagoons. This will allow suspended solids to settle before disposal;
- The installation of an impermeable cut-off ditch between the site and the watercourse as well as anywhere else needed on site to prevent any run-off water entering the watercourse. The cut-off ditch will lead to a sump with settled solids removed regularly and water recycled and reused where possible. Any excess water will be discharged to foul sewer with prior permission from your local sewerage provider, or tankered off site for authorised disposal; and
- Plant, wheel and boot washing.

### **4.2.4. Species Deterrence Measures (Reptiles, GCN and Hedgehogs)**

Measures may need to be taken to minimise the potential for causing the death and injury of individuals during site clearance, via the implementation of 'species deterrence' measures in the run-up to the commencement of works on-site, and 'destructive searches' of vegetation, where required. Full details of these measures will be devised after completion of the further surveys detailed above.

## **4.2.5. Good Construction Practices for Mammals**

In line with good practice, any open trenches and excavations associated with the development will either be closed at night or a means of escape provided (e.g. a wide plank at no greater angle than 45°) to help any badgers, otters, hedgehogs or other trapped animals escape.

Full details of precautionary measures will be devised after completion of the further surveys detailed above.

## **4.3. Mitigation Measures**

Full details of mitigation measures will be devised after completion of the further surveys detailed above.

### **4.3.1. Lighting Plan**

A sensitive lighting strategy must form part of the development plan during both construction and operational phases. This will mitigate against any light disturbance to foraging/commuting bats. Where practicable, this will involve no external lighting projecting along the watercourse or peripheral hedgerows of the site. This will create a 'dark corridor', allowing bats to continue to forage and commute along these linear features.

The lighting should follow a 'bat friendly' specification: External lighting will be minimised and installed at low-level only (i.e. no higher than eaves level and lower than 2.4m) and directed downward (i.e. below the horizontal plane with no upward tilt). Fully shielded lights with front and side hoods/shields or cowls will be installed to prevent upwards and horizontal light spill. The lighting source will not be visible.

Any security lights used will operate off a passive infrared (PIR) motion sensor sensitive to large objects only, to avoid constant triggers by bat passes and with timers set on a short duration (i.e. a maximum 'on' time of one minute) to reduce the amount of 'lit time'. The lights will either have an integrated LED light source or use LED bulbs. They will be low intensity (i.e. circa 11 watts) and have a warm white colour temperature of 3000K or less (ideally 2700K if commercially available). White, blue and green lighting sources, including mercury or metal halide, CPO and CDO (ceramic discharge metal-halide) bulbs, will be avoided as these have effects on bats. In addition, no works will be undertaken at night.

This lighting strategy will also mitigate against any light disturbance to dormice and otters.

Examples of suitable light fittings are provided within Appendix 11.

## **4.4. Compensation and Enhancement Measures**

### **4.4.1. Himalayan Balsam Eradication**

Himalayan balsam, an invasive plant, will be eradicated from the site as far as possible and appropriate measures implemented to prevent the accidental spread of this species during the development. Invasive plant material is considered a 'controlled waste' and must be disposed of in accordance with, and an environmental permit issued under, the Environmental Permitting (England and Wales) Regulations 2007.

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## Use of a Specialist Invasive Non-Native Species Contractor

A specialist Invasive Non-Native Species (INNS) contractor will be commissioned to produce a method statement and management plan dealing with the on-site

## Preventing Plants from Flowering

Initial control measures will aim to remove active plants from the site to prevent flowering. For maximum effectiveness this is best carried out before June<sup>21</sup>. Cutting, strimming or pulling up of the plants will be done from below the lowest node to prevent the plants from re-flowering. No strimming will be undertaken if seed pods are present. This action must be undertaken before the plants set seed to prevent the accidental dispersal of seeds. Two methods are recommended<sup>22</sup>:

## Hand Pulling

Small infestations can be easily controlled by hand pulling plants. The plants have a shallow root system and will be and will be pulled out by firmly holding the base of the stem. Care needs to be taken to avoid snapping the stem above the first node as plants can regrow. Plants will be pulled up in the spring or early summer (April/May) before flowering (June/July). The site will be revisited two weeks after the first session to pull up any smaller plants that were missed or any late germinators. Pulled plants can be left on-site to decompose in an open area or put in a compost bin. It is best to avoid taking the plants off site for disposal or putting them in the recycling bin in case there is contamination by seeds.

## Mowing and Cutting

Mowing and cutting are less labour intensive and may be more useful in this case at the outset, as there is a substantial amount of the plant on the site.

Cutting using a scythe, machete, flail or trimmer will be carried out before flowering in June. Plants will be cut close to ground level, below the lowest node, to prevent regrowth. A repeat cut may be needed and the site revisited after 2 weeks to check for regrowth.

Cut stems can be left on-site to decompose in an open area. It is best to avoid taking the plants off-site for disposal or putting them in the recycling bin in case there is contamination by seeds.

One of both of the above methods will be repeated annually to prevent the re-colonisation of the site.

## **4.4.2. Bird Boxes**

To compensate for the loss of bird nesting habitat, bird nesting opportunities be provided. Artificial bird boxes should be erected on suitable features within the site. A variety of durable, woodcrete bird boxes, including maintenance free boxes suitable for trees, are available from Schwegler. Two bird boxes should

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<sup>21</sup> Adapted from Environment Agency guidance, available at: <http://www.nonnativespecies.org/downloadDocument.cfm?id=1010>

<sup>22</sup> Adapted from the Welsh government's advice sheet, available at: <https://beta.gov.wales/sites/default/files/publications/2018-01/himalayan-balsam-controlling-it-on-your-land.pdf>

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be fitted to retained trees within the site boundary, or upon the residential dwelling itself. They should be located in secluded positions, ideally within dense cover and at a minimum height of 3 metres from ground level.

- Open fronted – Open fronted nest boxes cater for a range of bird species, including robin, dunnock (*Prunella modularis*) and wren. Due to the more exposed nature of these nest boxes, it is especially important to ensure that they are located in dense cover in order to avoid the attention of potential predators. Appendix 7 displays a typical example;
- Standard nest boxes – An entrance hole of 32mm will attract species such as great, blue, blackbirds and sparrows (see Appendix 8). These nest boxes can be sited on the retained trees or larger shrubs. Alternatively, boxes could be placed externally on building walls; or
- House sparrow – House sparrows are sociable birds and prefer to nest in colonies. Appendix 9 shows a typical house sparrow terrace nest box, which allows up to three pairs to breed in proximity to each other. Several terrace nest boxes could be sited in the same location to encourage a large colony of this vulnerable species. The terraces could be fitted to the external walls of the buildings, at elevations away from prevailing weather conditions (typically the south-west).

### **4.4.3. Establishment and Enhancement of Ecological Buffer**

An ecological buffer will be established between the protective fencing, watercourse and hedgerow.

Full details of the ecological buffer will be devised upon the completion of the further surveys detailed in Section 4.1.1.

### **4.4.4. Use of Native Landscaping Scheme**

Any new soft landscaping scheme for the site will include habitat enhancements that will benefit invertebrates, birds, foraging bats and reptiles. They will include the provision of shrubs or trees that bear berries or nuts. Native trees and shrubs that are indigenous to the region will be utilised, and any new plantings of native species should be of UK provenance (see Appendix 10).

Suitable species for use in any new tree or shrub planting include holly, common hawthorn, wild cherry (*Prunus avium*), rowan (*Sorbus aucuparia*) and guelder rose (*Viburnum opulus*). Alternatively, plant species that provide a rich source of nectar could be used. Suitable species include flowering herbs such as lavender (*Lavendula sp.*) and violets (*Viola sp.*), and shrubs such as flowering currant (*Ribes sanguineum*), privet (*Ligustrum vulgare*), forsythia (*Forsythia sp.*), dogwood (*Cornus sanguinea*), berberis (*Berberis sp.*), pyracantha (*Pyracantha sp.*) and ceanothus (*Ceanothus sp.*).

Any proposed flower borders within the site will be set aside for wild flowers, and will be planted with a wildlife-friendly seed mix.

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A species list that is provided by the Gwent Wildlife Trust will provide a mix of regional origin, thus supporting the long-term conservation of the species within the mix. This mix alone will be sowed. This mix of species is indicative of MG5 hay meadow. Species include: common knapweed, oxeye daisy, bird's foot trefoil, cowslip, common eyebright, common sorrel, field wood rush, yellow rattle (if sown October) and grass species such as sweet vernal, common bent and red fescue. A species mix will be provided by Emorsgate Seeds.

Ground preparation and sowing will need to take place in April or October, although October is the preferred period, as planting undertaken during the autumn to allow seedling roots to establish over the winter and have a greater chance of competing with the existing sward in the spring and summer. The most successful way to establish wild flowers and grasses from seed is to sow into a clean seedbed that has been first cleared of all weeds and other vegetation and then cultivated to produce optimum conditions for germination. The precise measurements of areas allocated to grass and flower planting is yet to be finalised. However, the sowing rate is 2-4g/m<sup>2</sup>. This should be used as a guide when purchasing the seed mixture.

Subsequent aftercare and site management will be required. The species-rich flower border habitat should ideally be mown in autumn as this timing allows plants to flower and set seed which will not only increase the floristic diversity of the site, but will also benefit invertebrates that require nectar sources and roosting locations during the spring and summer. Ideally, the sward should be cut to a height of about 8 to 10cm. Different areas of grassland should be mown on rotation in every second year in late summer (September), by hand or with small-scale mowing machine (ie. only half of grassland area will be cut each year). The uncut areas will be cut the following year so that the grassland areas are cut at least once every two years. Arisings should then be collected and removed from site.

The use of herbicides, pesticides and artificial fertilisers on site should generally be avoided, although pernicious weeds may need to be spot-treated with herbicide.

If new hedgerow planting is proposed, it is recommended that this will comprise native species-rich hedgerows, instead of the ornamental shrub hedgerows that are often used. This will enhance the ecological value of the site for nesting birds, foraging/ commuting bats, great crested newts and hedgehogs.

#### **4.4.5. Hedgehogs Habitat Management**

The following hedgehog friendly features should be considered for incorporation in the final design of the development:

- "Wild corners"- patches of long, natural vegetation could be left;
- Log piles to provide a secure site for use by breeding and hibernating hedgehogs. This should be sited in longer vegetation;
- The use of hedgerows instead of fences;

- The avoidance of pesticides including slug pellets, herbicides and insecticides during landscaping of the site; and
- Dedicated hedgehog nesting/hibernation shelters could be placed in suitable well-vegetated areas of the site. The Hogitat Hedgehog House could be used<sup>23</sup>.

## **4.5. Licensing**

It has not been possible to determine whether a NE European Protected Species mitigation licence with respect to GCN will be required. This will be determined after the further targeted surveys detailed in Section 4.1 have been completed.

## **4.6. Longevity of Report**

If development works do not begin within eighteen months to two years of the date of this report of this report, an update survey is likely to be required in accordance with guidance from NE, (CIEEM, 2019) and BS 42020:2013<sup>24</sup>, to determine if conditions have changed since those described in this report.

## **4.7. Conclusions**

The full extent of ecological impacts and potential constraints of the proposed development cannot be fully determined, based on the results of the preliminary ecological appraisal survey alone. Further survey work will be required before such assessments can be comprehensively made, as detailed in Section 4.1.

At this stage, the site's ecological value is not considered to represent a fundamental, in-principal constraint to the proposed development.

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<sup>23</sup> <http://www.nhbs.com/title/179699/hogitat-hedgehog-house>

<sup>24</sup> As set out in Section 6.2.1, point 7 which states that ecological information should not normally be more than two/three years old, or as stipulated in good practice guidance).

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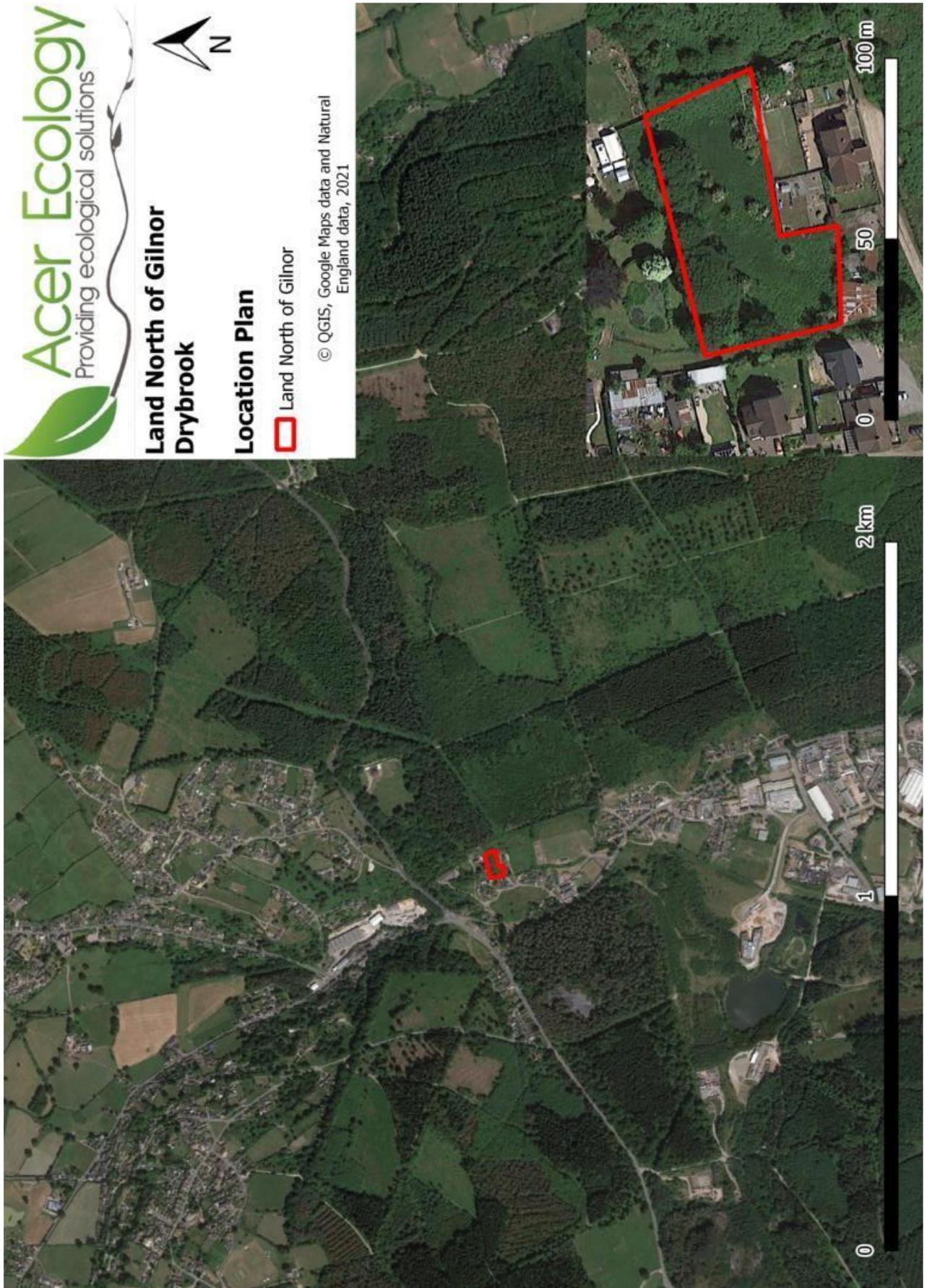
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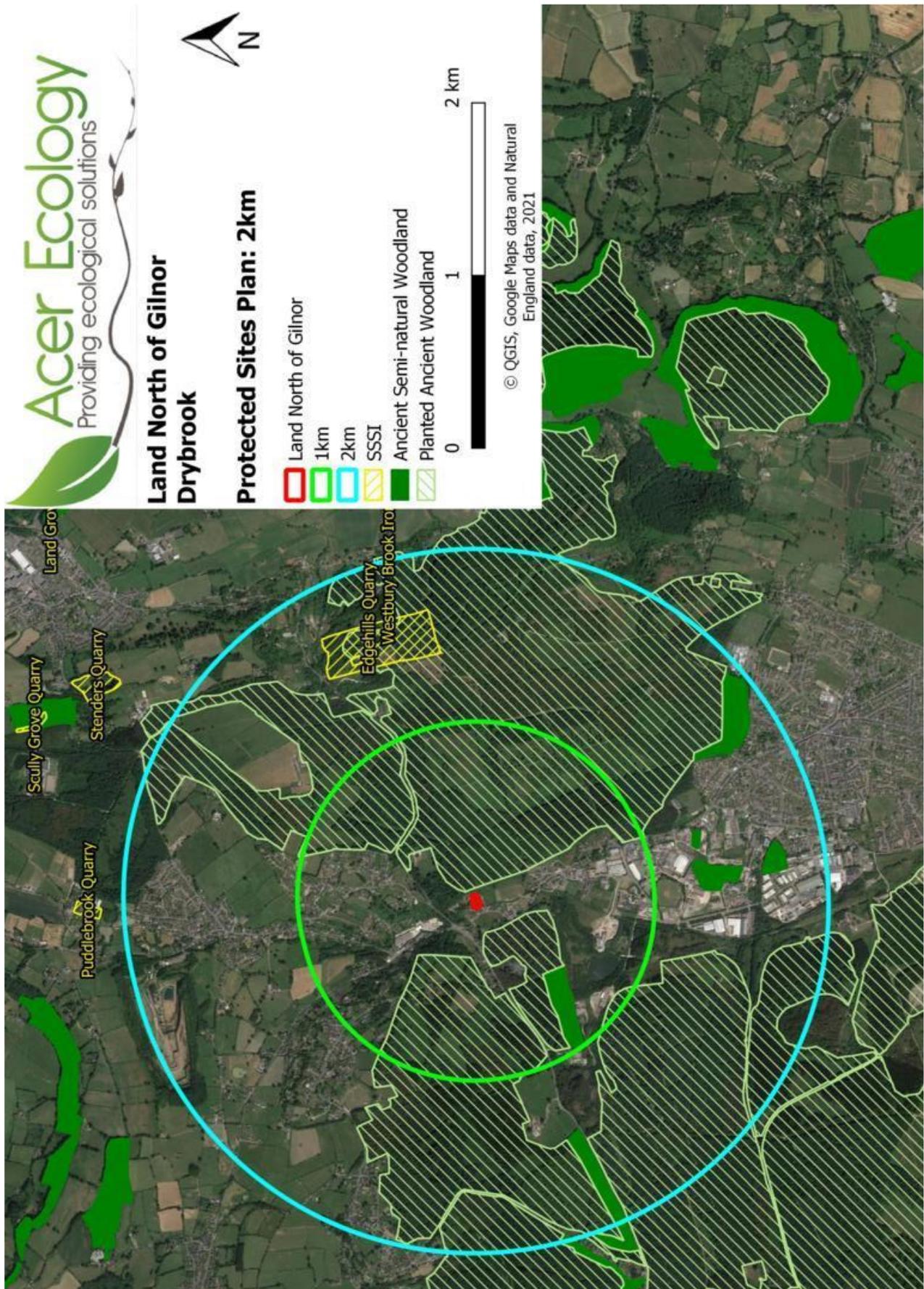
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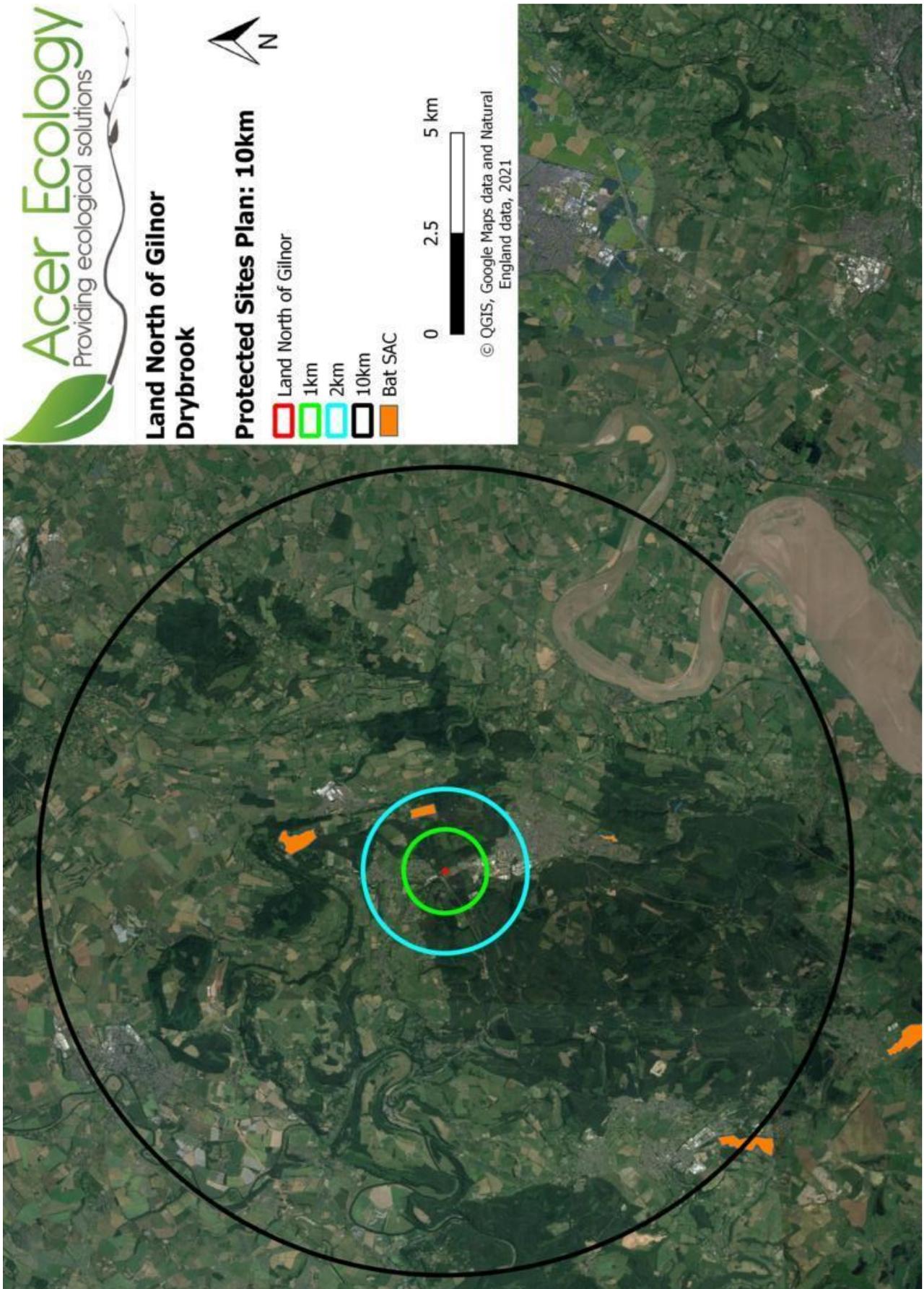
Plan 1: Site Location



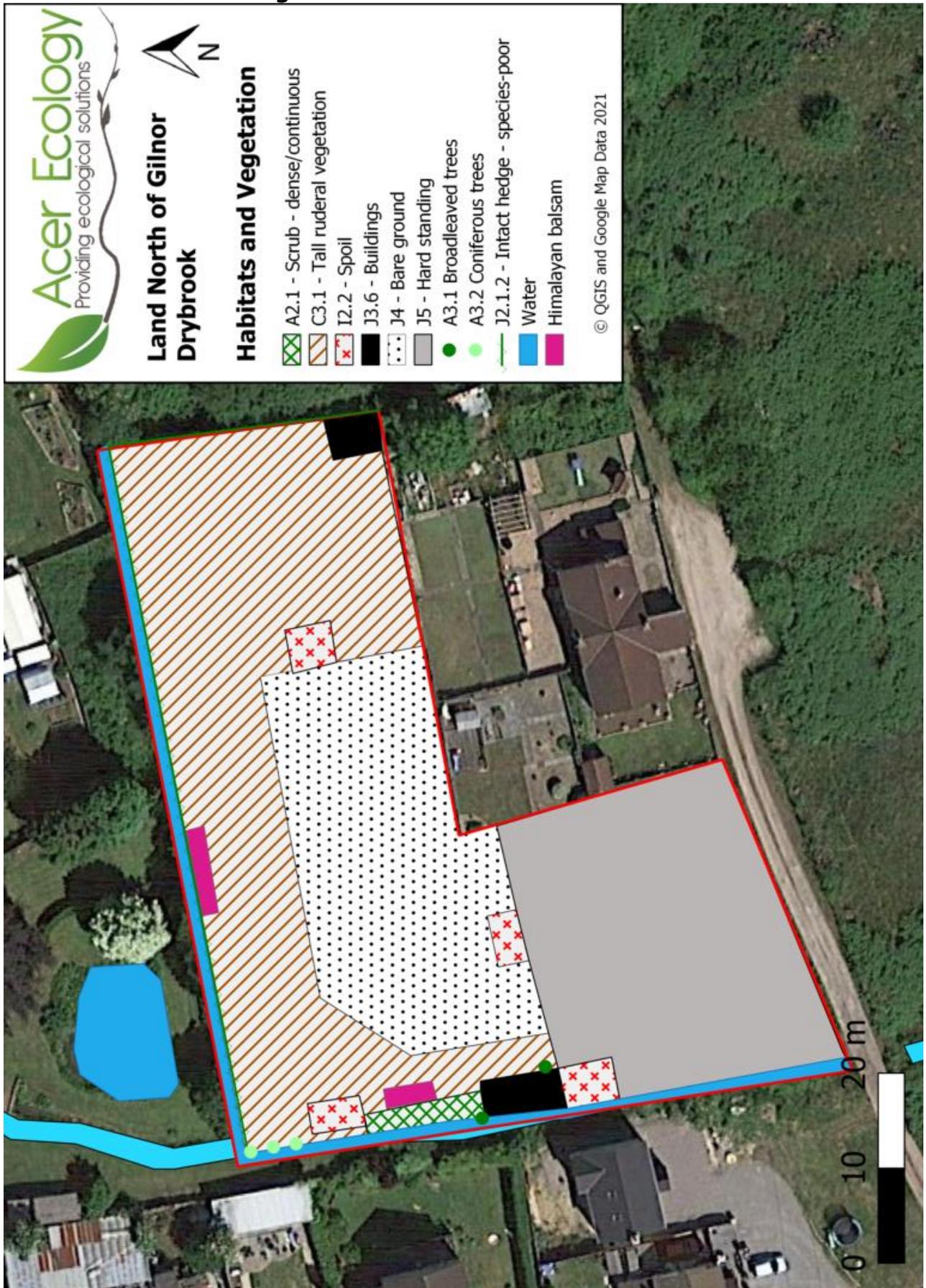
## Plan 2: Site Location and Protected Sites (2km Buffer)



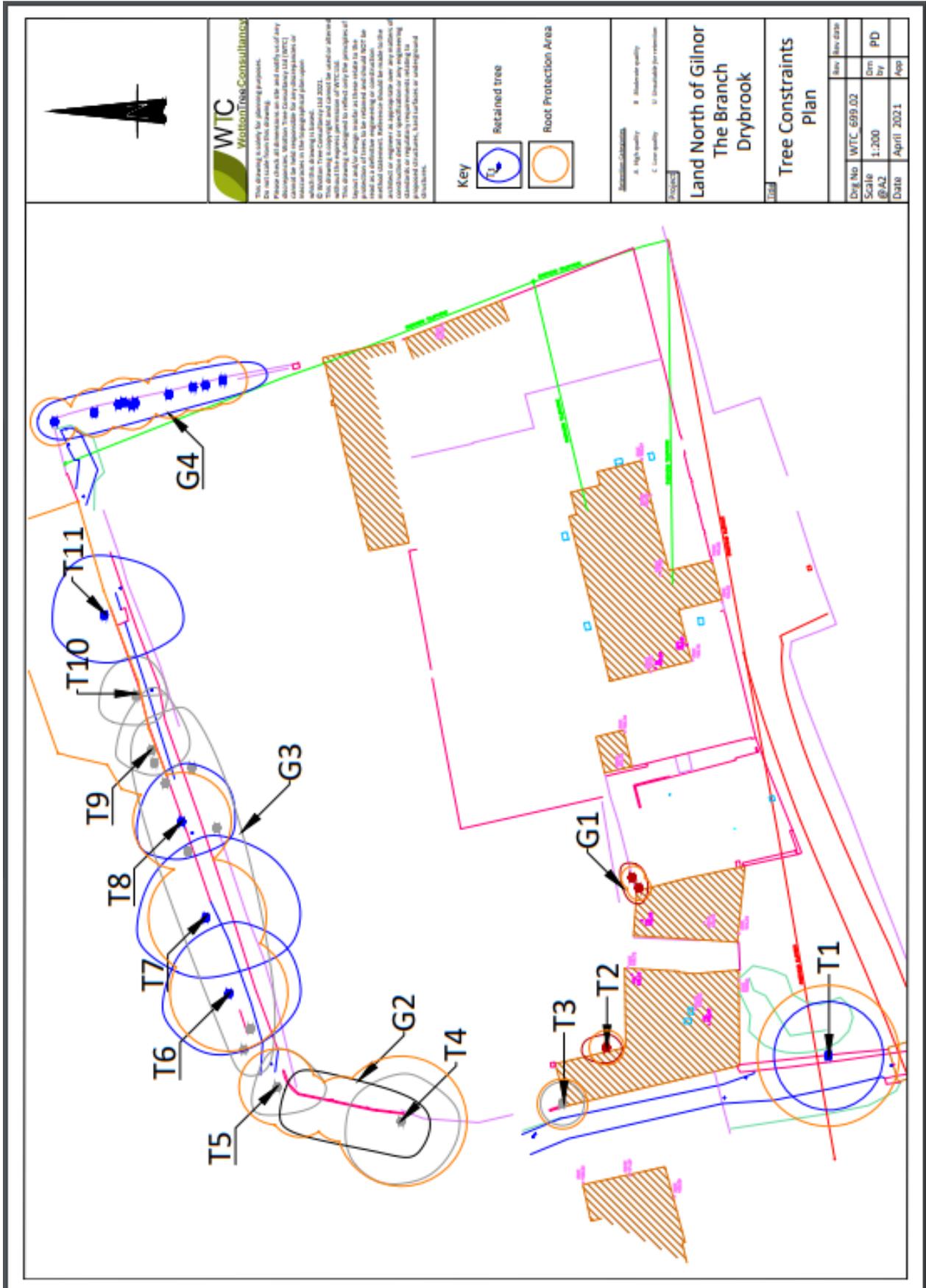
Plan 3: Site Location and Protected Sites (10km Buffer)



## Plan 3: Habitats and Vegetation

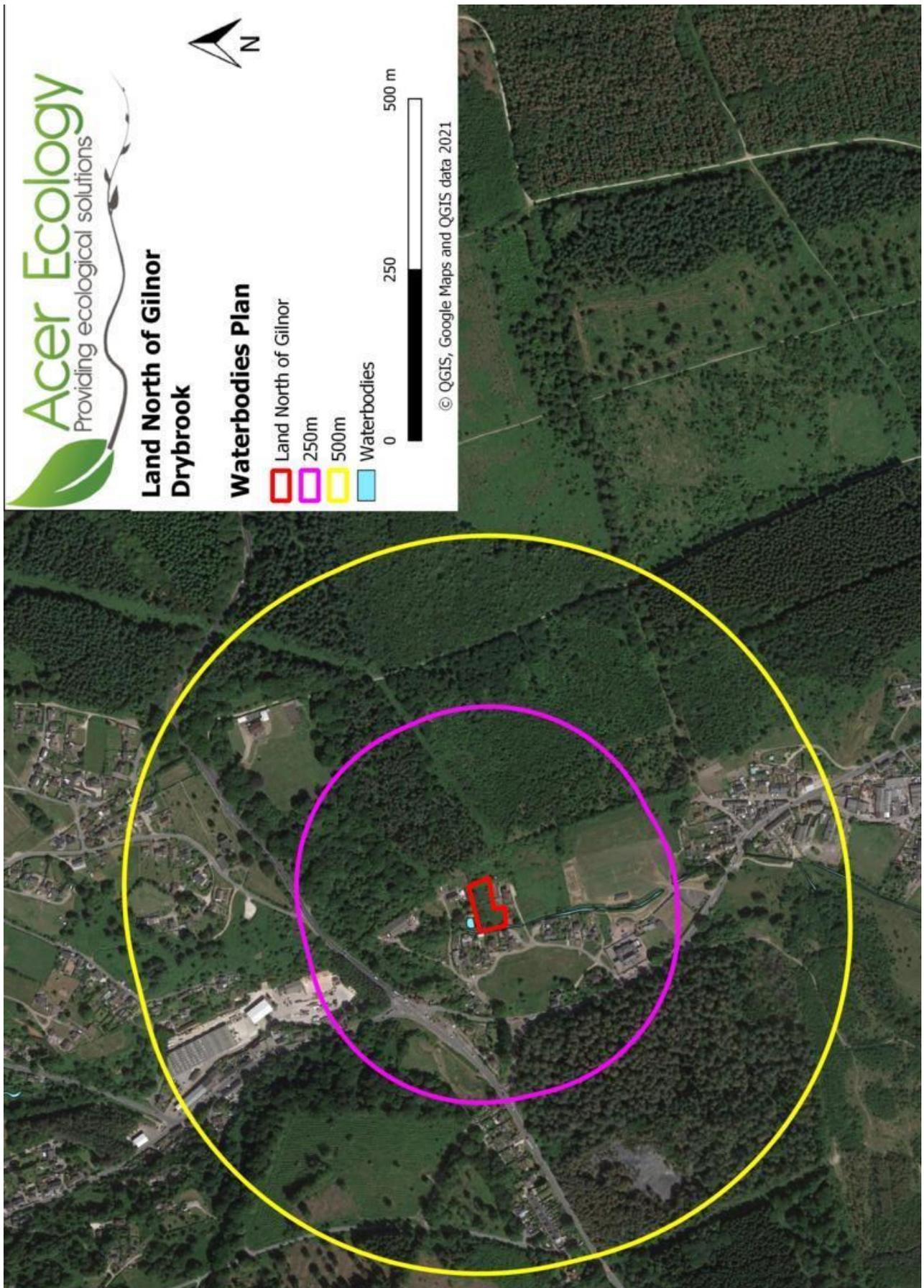


## Plan 4: Tree Plan<sup>25</sup>



<sup>25</sup> Wotton Tree Consultancy, Land North of Gilnor, The Branch, Drybrook: Tree Constraints Plan, April 2021

Plan 5: Location of Water Bodies within 0.5km of Site





## **Appendix 2: Legislation and Policy Relating to Statutory and Non-Statutory Designated Sites and Planning Policy**

### **SACs**

SACs are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds). Of the Annex I habitat types, 78 are believed to occur in the UK. Of the Annex II species, 43 are native to, and normally resident in, the UK.

### **SSSIs**

SSSIs are important as they support plants and animals that find it difficult to survive elsewhere in the countryside, and they represent the country's best wildlife and geological sites. SSSIs are legally protected under the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006, and are of national (second tier) biodiversity significance and form the essential building blocks of the United Kingdom's protected areas for nature conservation. Many are also designated as Natura sites i.e. internationally (first tier) designated sites. It is an offence for any person to intentionally or recklessly damage the protected natural features of a SSSI.

### **LNRs**

Under the National Parks and Access to the Countryside Act 1949, LNRs may be declared by local authorities after consultation with the relevant statutory nature conservation agency. LNRs are declared and managed for nature conservation, and provide opportunities for research and education, or simply enjoying and having contact with nature.

### **ASNW and Woodland**

The UK is a sparsely wooded country: 11.5% of Great Britain is covered with trees. Only 1.2% of the UK is ancient semi-natural woodland, a valuable and irreplaceable natural resource. Ancient semi-natural woodland, and plantations on ancient woodland sites, are a priority for conservation (JNCC).

The Welsh Assembly has recognised that areas of ancient woodland are declining and becoming increasingly fragmented and emphasises the importance of conserving ancient woodland and its value as a biodiversity resource through the publication of National Planning Policy Framework (2019).

Paragraph 170b states that planning policies and decisions should contribute to and enhance the natural and local environment by recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of trees and woodland.

# Acer Ecology

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Furthermore, the UK Biodiversity Action Plan (UKBAP) includes objectives to conserve, and, where practicable, enhance: the quality and range of wildlife habitats and ecosystems; the overall populations and natural ranges of native species; internationally important and threatened species, habitats and ecosystems; species, habitats and natural and managed ecosystems characteristic of local areas; and biodiversity of natural and semi-natural habitats where this has been diminished over recent decades.

## **Natural Environment and Rural Communities (NERC) Act 2006**

Under Section 40 of the Natural Environment and Rural Communities Act (2006), Local authorities have a duty to have regard to the conservation of biodiversity in exercising their functions. The duty affects all public authorities and aims to raise the profile and visibility of biodiversity, to clarify existing commitments regarding biodiversity, and to make it a natural and integral part of policy and decision making.

## **National Planning Policy Framework (2019)**

The National Planning Policy Framework (2019) states that the presence of a protected species should be a material consideration when considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat.

## Appendix 3: Protected and Invasive Species Legislation

### Birds

All wild British birds (while nesting, building nests and sitting on eggs), their nests and eggs (with certain limited exceptions) are protected by law under Section 1 of the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000. Included in this protection are all nests (at whatever stage of construction or use) and all dependent young until the nest is abandoned and the young have fledged and become independent. Particularly rare species such as barn owl (*Tyto alba*) are listed on Schedule 1 which gives them additional protection from disturbance whilst nest building, whilst near a nest with eggs or young, or from disturbing the dependent young.

### Bats

All species of bats and their roosting sites are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species (Amendment) (EU Exit) [‘CHSAEU’] Regulations 2019. All species of UK bats are designated as ‘European protected species’. Seven species of bat (soprano pipistrelle, barbastelle, Bechstein’s (*Myotis bechsteinii*), noctule, brown long-eared, lesser horseshoe and greater horseshoe bats) are listed under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

### Great Crested Newt

Great Crested Newt is a ‘European protected species’ afforded full protection under both UK and European legislation. This protection extends to the habitats which support great crested newt and it is generally assumed that the species might be present in terrestrial habitats up to 0.5km<sup>26</sup> of a breeding pond, depending on habitat quality, connectivity and population size. The great crested newt is listed under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

### Dormice

Dormice are a ‘European protected species’ and afforded full protection under both UK and European legislation. Dormice are listed under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England. Since 2000, the UK population has declined by over a half (51%), decreasing on average by 3.8% per year (PTES, 2019).

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<sup>26</sup> Great Crested Newts have been recorded travelling long distances: 1.3km within a 7-week period by an immature individual great crested newt (Kupfer 1998, detailed in Jehle et al 2011); 250m in a study by Beebee and Griffiths (2000) and 120-360m in a study by Arntzen and Tenuis (1993). In addition, a study by Duff (1989) found that over half of a population overwintered in an area more than 120m away from the main breeding pond. However, long-distance movement of great crested newt is rare and most studies indicate that much shorter distances are typical (Jehle et al 2011). As a general rule, suitable habitats within 250m of a breeding pond are likely to be used most frequently (English Nature 2001).

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# Acer Ecology

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## Otters

Otters are designated as 'European Protected Species'. Their breeding sites or resting places<sup>27</sup> are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species (Amendment) (EU Exit) [CHSAEU] Regulations 2019. Otter is listed under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

Works affecting otter are subject to licensing procedures by Natural England (NE).

## Water Voles

Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) which prohibits the deliberate killing or injury of individuals, damaging, destroying or blocking access to their places of protection (either intentionally or through ignorance), disturbing them in a place of shelter, or possessing them. The habitats of common water voles are not specifically protected. Water voles are listed as a priority species under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

## White-clawed Crayfish

White-clawed crayfish are listed in the Habitat's and Species Directive (Annex 2 non-priority species) and are listed in England under Schedule 5 of the Wildlife and Countryside Act (1981). They are also listed as priority species under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

## Badgers

Badgers are protected under the Protection of Badgers Act 1992. Protection applies both to the animal itself and to its nesting burrows (setts), and current interpretation of the Act also confers some protection to key foraging areas.

## Reptiles

With the exception of smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) (which are afforded greater protection), common reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are given so-called 'partial protection', which prohibits the deliberate killing or injury of individuals. The habitats of common reptiles are not specifically protected. These species are listed as being of principal importance for maintaining and enhancing biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006.

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<sup>27</sup> Resting places are defined as 'areas that are essential to sustain an animal or group of animals when they are not active' (Anon 2007).

## Hedgehogs

Hedgehogs are listed as a Red List mammal species in Britain and are afforded partial protection under the Wildlife and Countryside Act (1981) and are listed as priority species under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England. Additionally, hedgehogs are listed a priority species listed under the UK Biodiversity Action Plan in light of dramatic population declines. The legislation afforded to hedgehogs in the Countryside and Rights of Way (CRoW) Act 2000 means that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. In effect, 'conserving biodiversity' includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

The legislation afforded to hedgehogs in the National Planning Policy Framework (2019) requires all public bodies including Local Authorities to have regard for biodiversity conservation<sup>28</sup> when carrying out their functions.

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<sup>28</sup> Biodiversity conservation in respect to hedgehogs is interpreted as a commitment to restoring or enhancing their population.

# Acer Ecology

## Appendix 4: Species Recorded

All species recorded by Acer Ecology, 2021

Taxonomic Name	Common Name	W	LM	CG	LDA	PMR	PIL	TF	Status
<b>Trees and Shrubs</b>									
<i>Acer pseudoplatanus</i>	Sycamore								Alien
<i>Aesculus hippocastanum</i>	Horse chestnut								Alien
<i>Carpinus betulus</i>	Hornbeam								
<i>Crataegus monogyna</i>	Common hawthorn								
<i>Fraxinus excelsior</i>	Ash								
<i>Ilex aquifolium</i>	Holly								
<i>Prunus domestica</i>	Plum								
<i>Prunus</i> sp.	Cherry sp.								
<i>Rubus fruticosus</i> agg.	Bramble								
<i>x Cupressocyparis leylandii</i>	Leyland cypress								Alien
<b>Herbaceous Plants</b>									
<i>Aegopodium podagraria</i>	Ground-elder								Alien
<i>Alliaria petiolata</i>	Garlic mustard								
<i>Anthriscus sylvestris</i>	Cow parsley								
<i>Arum maculatum</i>	Lords-and-ladies								
<i>Brachypodium sylvaticum</i>	False brome								
<i>Calystegia sepium</i>	Hedge bindweed								
<i>Cardamine flexuosa</i>	Wavy bitter-cress								
<i>Carex riparia</i>	Greater pond sedge					PMR			
<i>Cirsium arvense</i>	Creeping thistle								
<i>Dryopteris affinis</i> agg	Scaly male-fern	W							
<i>Epilobium hirsutum</i>	Great willowherb								
<i>Filipendula ulmaria</i>	Meadowsweet					PMR			
<i>Galium aparine</i>	Cleavers								
<i>Geum urbanum</i>	Wood avens								
<i>Heracleum sphondylium</i>	Hogweed								
<i>Hippuris vulgaris</i>	Mare's tail								
<i>Hyacinthoides non-scripta</i>	Bluebell	W							WCA 5
<i>Impatiens glandulifera</i>	Himalayan balsam								WCA 9
<i>Lamium album</i>	White dead-nettle								
<i>Pteridium aquilinum</i>	Bracken								
<i>Ranunculus repens</i>	Creeping buttercup								
<i>Rumex crispus</i>	Curled dock								
<i>Senecio vulgaris</i>	Groundsel								
<i>Stellaria holostea</i>	Greater stitchwort								
<i>Urtica dioica</i>	Common nettle								

# Acer Ecology

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<b>'Habitat Indicator Species' Totals (Wales Biodiversity Partnership 2008<sup>29</sup>)</b>									
	2					2			
	<b>W</b>	<b>LM</b>	<b>CG</b>	<b>LDA</b>	<b>PMR</b>	<b>PIL</b>	<b>TF</b>		
Note: Indicator species have been devised for use in Wales but are considered relevant for English sites too.									

## **Key to Indicator Species (Wales Biodiversity Partnership 2008<sup>30</sup>)**

W - Woodland, LM – Lowland meadow, CG - Calcareous Grassland, LDA – Lowland Dry Acid Grassland, PMR Purple moor-grass and rush pasture, PIL – Post Industrial Land, TF Species-rich Tillage Fields and Margins

WCA 5 – Species protected under Schedule 5 of the Wildlife and Countryside Act

WCA 9 – Species listed under Schedule 9 of the Wildlife and Countryside Act

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<sup>29</sup> Wales Biodiversity Partnership (2008) Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales. Wales Biodiversity Partnership/Welsh Assembly Government.

## Appendix 5: Definitions of Site Value

### International Value

Internationally designated or proposed sites such as Ramsar Sites, Special Protection Areas, Biosphere Reserves and Special Areas of Conservation, or non-designated sites meeting criteria for international designation. Sites supporting populations of internationally important species or habitats.

### National Value

Nationally designated sites such as Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria (NCC 1989), National Nature Reserves (NNRs) or Nature Conservancy Review (NCR) Grade 1 sites, viable areas of key habitats within the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book (RDB) species (excluding scarce species), or supplying critical elements of their habitat requirements.

### Regional Value

Sites containing viable areas of threatened habitats listed in a regional Biodiversity Action Plan, comfortably exceeding Site of Importance for Nature Conservation (SINC) criteria, but not meeting SSSI selection criteria. Sites supporting regionally significant areas of BAP habitats or large and viable populations Nationally Scarce species, or those included in the Regional Biodiversity Action Plan on account of their rarity, or supplying critical elements of their habitat requirements.

### County Value/District Value

Site identified as a Site of Importance to Nature Conservation (SINC) at the district level; meeting the Department for the Environment, Food and Rural Affairs (DEFRA) 2006 published guidance on the identification, selection and management of local sites, but falling short of SSSI designation criteria, whether designated as a SINC or not. Ancient woodlands and sites supporting regionally significant areas of UK BAP habitat. Large scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/ LBAP or threatened species (other than badger).

### High Local

Habitats which just fail to meet Regional value criteria, but which appreciably enrich the ecological resource of the locality. Sites supporting species which are notable or uncommon in the county; or species which are uncommon, local or habitat-restricted nationally, and which might not otherwise be present in the area. Moderate scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/LBAP or threatened species.

### Local Value

Old hedges, woodlands, ponds, significant areas of species-rich grassland, small scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/LBAP or threatened species. Undesignated sites or features which appreciably enrich the habitat resource in the context of their immediate surroundings, parish or neighbourhood (e.g. a species-rich hedgerow). Rare or uncommon species may occur but are not restricted to the site or critically dependent upon it for their survival in the area.

### Site Value (within the immediate zone of influence)

Low-grade and widespread habitats. Woodland plantations, structured planting, small areas of species-rich grassland and other species-rich habitats not included in the UK or Local BAP.

### Negligible

No apparent nature conservation value.

# Acer Ecology

## Appendix 2: Guidelines for Assessing Potential Suitability of a Proposed Development Site for Bats <sup>31</sup>

Suitability	Description of Roosting Habitat	Commuting and Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting and foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection appropriate conditions<sup>32</sup> and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity) or hibernation<sup>33</sup>.</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground<sup>34</sup>.</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only) the assessments in this table are made irrespective of conservation status, which is established after presence is confirmed.	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	<p>Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

<sup>31</sup> Table 4.1 in Collins (2016)

<sup>32</sup> For example, in terms of temperature, humidity, height above ground levels, light levels or levels of disturbance.

<sup>33</sup> Evidence from the Netherlands, shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for large numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

<sup>34</sup> This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

## Appendix 7: Open-Fronted Nest Box

Schwegler 2H Half Box

These should never be hung on trees or bushes as this could allow small predators to access the interior and predate nesting birds.

This nest box should always be installed on the external walls of houses, barns, garden sheds etc. It is designed to be hung so that the entrance is to one side (90° angle to wall).

Correctly positioned it can attract species such as Black Redstart, Pied Wagtail, Grey Spotted Flycatcher, and occasionally Robin and Wren.

The front panel is easily removed to facilitate cleaning.



## Appendix 8: Standard Hole Nest Box

### Nest Box 1B

Material: SCHWEGLER wood-concrete



Great Tit

The internal diameter of this nest box is 12 cm. It is usually attached to a tree using the Aluminium Nail (see Fig. 1). It can also be hung from a branch (see Fig. 2).

The front panels, which can be bought separately, are interchangeable between model 1B, 2M and 2F, and can easily be removed from the nest box. Different entrance hole sizes are available to prevent birds from competing with one another for the boxes.

Available entrance hole sizes:

Ø 32 mm, Ø 26 mm and Oval 29 x 55 mm

Suitable for the following species:

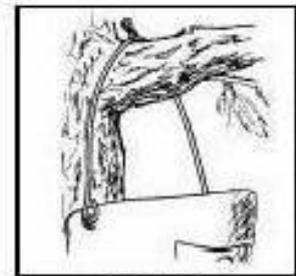
- Entrance hole 32 mm: Great-, Blue-, Marsh-, Coal- and Crested Tit, Redstart, Nuthatch, Collared and Pied Flycatcher, Wrenneck, Tree and House Sparrows, bats.

- Entrance hole 26 mm: Blue-, Marsh-, Coal- and Crested Tit, possibly Wren. All other species are prevented from using the nest box due to this smaller entrance hole.

- Oval entrance hole: (29 x 55): Redstart; also used by species that nest in the Ø 32 mm boxes. However, because more light enters the brood chamber, it is preferred by Redstarts.



Clutch of Great Tit eggs



From a branch (Fig. 2)



On the trunk, using Aluminium Nail (Fig. 1)

### Standard Hole Nest Box

The Schwegler 1B general small bird box will be preferably mounted on a stable tree trunk, rather than on branches which will sway. The mounting location will not be heavily shaded. Boxes should be mounted vertically on the tree.

Boxes will be mounted a minimum of 2m, and preferably 3m, above the ground, and as far as possible placed on the SE- or SW-facing surfaces of the tree trunks.

# Acer Ecology

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## Integrated Standard Hole Nest Box

Our Standard nesting boxes are suitable for House Sparrows and members of the tit family. The single entrance hole allows the entire internal area to be available for nesting and roosting. The aperture size will vary according to the target species and box fronts can be removable if required.



## Appendix 9: House Sparrow Nest Box

### Schwegler 1SP Sparrow Terrace

Sparrows are gregarious and prefer to nest close to each other, so this triple-nest box provides room for three families under one roof. It's made from long-lasting, breathable woodcrete to provide the optimum environment for sparrows to nest and rear their chicks.



**Positioning:** On buildings of all kinds in typical habitats including industrial buildings and barns at a height of at least 2m (e.g. under eaves)

**Suitable for:** House and tree sparrows and individual redstarts

**Material:** Woodcrete PLUS

**Height:** 240mm

**Width:** 430mm

**Depth:** 220mm

**Weight:** 15kg

### Habibat Integrated Sparrow Terrace

Made of insulating concrete with three internal roost spaces, this sparrow terrace can be seamlessly integrated into the fabric of a building. Can be faced to suit the design build, including brick, block, stone, wood or a rendered finish.

Dimensions: 44 x 21.5 x 15 cm.



## Appendix 10: Wildlife Friendly Plants Recommended for Landscaped Areas

**Species Suitable for More Formal Areas – i.e Landscape Schemes Which are Open to the Public.  
Species Chosen are Robust and Hardy, Low Growing and Require only Low Maintenance**

**Note:** Native species are marked in bold, however, wild grown forms of the plants may be difficult to source as nursery stock for these species is often foreign-grown.

### Woody Species

Anemone clematis (*Clematis Montana*)  
Bearberry cotoneaster (*Cotoneaster dammeri*)  
Birmingham Photinia (*Photinia fraseri*)  
Broad-leaved Cockspur Thorn (*Crataegus prunifolia*)  
Cherry Laurel (*Prunus Laurocerasus* 'Cherry Brandy')  
Climbing Hydrangea (*Hydrangea petiolaris*)

#### **Common hawthorn (*Crataegus monogyna*)**

Compact Laurel Hedge (*Prunus laurocerasus* 'otto luyken')  
'Daydown' Shrubby cinquefoil (*Potentilla fruticosa* 'Daydown')

#### **Dogwood (*Cornus sanguineus*)**

Donards seedling (*Escallonia* 'Donards Seedling')  
Escallonia (*Escallonia ivelyi*)

#### **Field maple (*Acer campestre*)**

Firehill Russian Almond (*Prunus tenella* 'Fire Hill')

#### **Flowering Cherry (*Prunus* 'Snow Goose')**

Himalyan cotoneaster (*Cotoneaster simonsii*)  
Honeysuckle 'Maigreen' (*Lonicera nitida* 'Maigreen')  
Japanese skimmia (*Skimmia japonica* 'Rubella')  
Lebanese wild apple (*Malus trilobata*)  
Lesser periwinkle 'Bowles' Variety (*Vinca minor* "Bowles Blue")

Meidomonac' Rose (*Rosa Bonica*)

Mexican orange blossom (*Choisya ternate*)

Mugo pine (*Pinus mugo*)

Osmarea Burkwoodii (*Osmanthus* x *Osmarea burkwoodii*)

Red flowered Escallonia (*Escallonia macrantha*)

Rock rose (*Cistus corbariensis*)

#### **Rowan (*Sorbus aucuparia*)**

Shrubby Veronica 'Emerald Green' (*Hebe* 'Emerald Green')

Silver bush (*Convolvulus cneorum*)

Snowy mespilus (*Amelanchier lamarckii*)

Spindle 'Emerald n Gold' (*Euonymus* Emerald n Gold)

Spindle 'Emerald Gaiety' (*Euonymus fortunei* 'Emerald Gaiety')

Winged spindle (*Euonymus alata*)

### Herbs and Ferns

#### **Bluebell (*Hyacinthoides non-scripta*)**

Daffodil Minnow (*Narcissus* 'Minnow')

#### **Hart's Tongue-Fern (*Phyllitis scolopendrium*)**

Holly 'Golden von Tal' (*Ilex aquifolium* 'Golden von Tol')

Ivy (*Hedera helix*)

Ivy 'Green ripple' (*Hedera helix* ivy 'Green Ripple')

Ivy 'Goldheart' (*Hedera helix* 'Goldheart')

Large-cupped Daffodil (*Narcissus* 'Carlton')

Miniature daffodil (*Narcissus* 'Tete-a-Tete')

#### **Snowdrop (*Galanthus nivalis*)**

## Appendix 11: Example of Suitable Wall Light Fittings

	Description
	Lightfitting sourced from <a href="http://www.energylightbulbs.co.uk/products/single-outdoor-wall-with-pir-movement-sensor-stainless-steel?gclid=CLuf2c63hM4CFYVAGwod0sYPvg">http://www.energylightbulbs.co.uk/products/single-outdoor-wall-with-pir-movement-sensor-stainless-steel?gclid=CLuf2c63hM4CFYVAGwod0sYPvg</a>
	Light fitting sourced from <a href="https://www.kichler.com/kichler/products/outdoor-lighting/outdoor-wall-lights/outdoor-wall-lights-no-arms/outdoor-wall-1lt-led-azt/">https://www.kichler.com/kichler/products/outdoor-lighting/outdoor-wall-lights/outdoor-wall-lights-no-arms/outdoor-wall-1lt-led-azt/</a>
	Lighting sourced from <a href="https://www.kichler.com/kichler/products/outdoor-lighting/outdoor-wall-lights/outdoor-wall-lights-no-arms/3000-k-led-outdoor-lantern-bkt/">https://www.kichler.com/kichler/products/outdoor-lighting/outdoor-wall-lights/outdoor-wall-lights-no-arms/3000-k-led-outdoor-lantern-bkt/</a>
	Light fitting sourced from <a href="https://hammertonstudio.com/products/arch-sconce-24-h/">https://hammertonstudio.com/products/arch-sconce-24-h/</a>
	Lighting sourced from <a href="https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/#!/Aged-Bronze-Bell-Shaped-Dark-Sky-Outdoor-Wall-Lantern/p/116556105/category=12541418">https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/#!/Aged-Bronze-Bell-Shaped-Dark-Sky-Outdoor-Wall-Lantern/p/116556105/category=12541418</a>
	Lighting sourced from <a href="https://www.homedepot.com/p/Home-Decorators-Collection-1-Light-Champagne-Silver-Outdoor-Wall-Mount-Barn-Lantern-Sconce-22999/302006431">https://www.homedepot.com/p/Home-Decorators-Collection-1-Light-Champagne-Silver-Outdoor-Wall-Mount-Barn-Lantern-Sconce-22999/302006431</a>
	Lightng sourced from <a href="https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/#!/Bronze-Outdoor-LED-Wall-Lantern-Sconce/p/50117847/category=12541418">https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/#!/Bronze-Outdoor-LED-Wall-Lantern-Sconce/p/50117847/category=12541418</a>
	Lighting sourced from <a href="http://www.theopenboxshop.com/hampton-bay-lexington-collection-outdoor-rustic-bronze-led-medium-wall-lantern/">http://www.theopenboxshop.com/hampton-bay-lexington-collection-outdoor-rustic-bronze-led-medium-wall-lantern/</a>

A tool for finding `bat-friendly` lighting is available at <https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/fsa-products/>