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Preliminary Ecological Appraisal

October 2022

Land to the Rear of College Avenue
Formby
Merseyside
L37

National Grid Reference: SD29020743

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Executive Summary

As part of a proposed planning application regarding a plot of disused land to the rear of College Avenue in Formby, a Preliminary Ecological Appraisal (PEA) was undertaken by Tyrer Ecological Consultants Ltd during October 2022, in accordance with the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and other best practice guidance. It is understood that proposals entail the construction of a single detached dwelling with associated landscaping and access. This survey and report were commissioned by Keith Davidson Partnership.

Extensive findings, conclusions and recommendations are presented throughout the report; however, the reader should be aware of the following Key recommendations:

Bats: Based upon the findings of the survey covered through sections 6.0-7.0 of the report and supported by Appendix I, whilst following best practice guidance, the land to the rear of College Avenue was found to hold 'Negligible' bat roost suitability in accordance with the Bat Conservation Trust - Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd ed. (2016). *No further surveys are required in relation to bats, with general enhancement measures recommended in Appendix II.*

Breeding Birds: The existing trees, shrubs, and other tall vegetation provide suitable nesting platforms that could be used by a variety of common birds associated with rural and garden environments, whilst the tall grasslands provide opportunities for ground-nesting birds frequently associated with agricultural areas. *All vegetation clearance works and demolition of the building should occur outside of the breeding bird season of March-August unless it can be demonstrated by a suitable qualified, professional ecologist that breeding birds are absent beforehand.*

Terrestrial Mammals: In relation to Hedgehog, habitats present offer high suitability for discrete foraging, territory marking, rest, shelter and hibernation, and the likelihood of Hedgehogs using the site is high. *It is therefore recommended that a working Method Statement detailing Reasonable Avoidance Measures (RAMs) is created by a suitably experienced ecologist to reduce the risk of harming small mammals or other terrestrial fauna during the construction phase of the proposed development.*

Red Squirrel: The proposed works, in their current form, are unlikely to have an adverse impact upon red squirrels, although the potential of this species utilising this site for commuting purposes cannot be ruled out. *Before any of the trees on site are felled, then a pre-commencement check should be carried out prior to removal. If Red squirrels are found during the check, then an ecologist should be contacted to provide further guidance, which may involve a further site visit to appraise the situation and provide recommendations*

Biodiversity Enhancement: A series of recommendations have been given within section 8.0 and Appendix III which provide opportunities for biological enhancement at the development site and within the wider area. Enhancement opportunities include recommendations relative to the provision of favourable planting and landscaping, with wildlife boxes.

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1.0 Introduction & Objectives

1.1 As part of a proposed planning application regarding a plot of disused land to the rear of College Avenue in Formby (see Figure 1.1), a Preliminary Ecological Appraisal (PEA) was undertaken by Tyrer Ecological Consultants Ltd during October 2022, in accordance with the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and other best practice guidance. It is understood that proposals entail the construction of a single detached dwelling with associated landscaping and access.

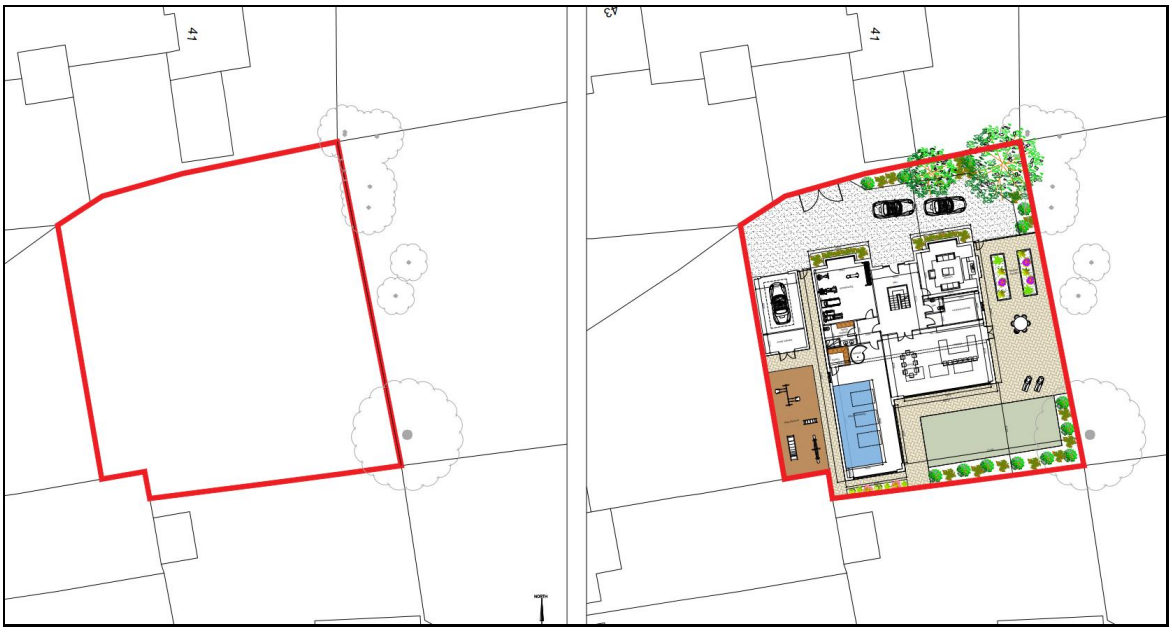


Figure 1.1: *Existing and proposed site plans* (*©Keith Davidson Partnership*).

1.2 Ecological surveys, particularly where a specially protected / noteworthy species is or may be present, are generally required as part of the Local Authority's Planning Policies. This survey and report were commissioned by the Keith Davidson Partnership.

Aims & Objectives

1.3 The aim of the survey was to ascertain the nature of the land, and where possible obtain information on any priority wildlife habitats, or species, that may be present and if so determine if they will be affected by the proposals. The survey therefore includes the following objectives:

- Gather baseline ecological information on site/off site (as necessary),
- Identify any likely ecological constraints associated with the proposals for the site (i.e. the presence of protected/priority habitats or species that exist within the confines of the application boundary, or zone of influence (ZOI),
- Identify mitigation / compensation measures likely to be required in line with the mitigation hierarchy (i.e. avoidance > impact minimisation > mitigation > compensation),
- Identify additional survey requirements following on from this preliminary appraisal,

- Identify a series of enhancement opportunities for biodiversity in line with national and local planning policy following '*Biodiversity Net Gain: Good practice principles for development*' (CIEEM *et. al.*, 2019).

1.4 As part of this ecological appraisal:

- Habitats on site were identified, measured and mapped using the UK Habitat Classification – Habitat Definitions Version 1.1 (2020)

- One building was assessed for its potential to host roosting bats in line with current Bat Conservation Trust (BCT) guidance.

1.5 As part of the Local Planning Authorities (LPA) planning policies and obligations to the Planning Framework, ecological surveys are generally required prior to planning permission being granted, particularly where protected/priority species are, or may be present, that could be affected by the proposals for which the application seeks consent.

1.6 This report will therefore provide baseline information as derived from the diurnal appraisal process outlined above and recommend any necessary additional surveys, or work, where applicable, to provide a conclusive ecological impact assessment.

1.7 The Applicant should be aware that if during the appraisal:

- The application site/area was found to be suitable for any European Protected Species (EPS), otherwise protected, or priority habitats/species, or,

- Signs of use by particular protected species were found, or suspected, or,

- Seasonal constraints significantly limit the gathering of ecological information to arrive at an accurate conclusion on which the planning application can proceed,

Then more detailed surveys may be recommended where necessary, to allow the ecologist to arrive at a conclusive impact assessment.

1.8 If any protected species was subsequently found during detailed further surveys and / or may be affected by the development proposals, then a European Protected Species Mitigation Licence (EPSML) may be required to proceed with the development.

1.9 Where more detailed surveys are recommended by the ecologist, following ecological appraisal, then Local Planning Authorities (LPA's) on the advice of their ecological advisors, may not grant permission until such time that all relevant material information is gathered in accordance with their obligations to the legislature.

1.10 Protected/priority species omitted from this report have been discounted due to factors including obvious absence/isolation of suitable habitats, and/or distributional aspects negating the necessity to survey for them, and/or the proposed works were not considered to negatively impact the species or encroach on areas where the species may be present.

2.0 Legislation & Policy

2.1 The legislature considered for the purposes of this report includes the following:

- Conservation of Habitats and Species Regulations (amendment) (2019) (EU Exit)
- Wildlife and Countryside Act (1981) (as amended)
- Countryside Rights of Way (CRoW) Act (2000)
- Natural Environment and Rural Communities (NERC) Act 2006
- Protection of Badgers Act (1992)
- The Hedgerow Regulations (1997)
- Town and Country Planning Act (1990)
- Wild Mammals Protection Act (1996)

2.2 These acts entail relevance to both protected and invasive species. The degree of protection offered to taxa provided within existing UK and EU legislature often varies depending on species/group, for example, some species may purely be protected during one of its life stages (e.g. common species of breeding bird whilst nesting/with eggs/young); some species may receive full protection within the EU (e.g. otter), whereas others may be protected solely on a national basis (e.g. grass snake).

2.3 Table 2.1 contains appropriate legislature to each species/group specifically respective to the site and provides the relevance of said legislation.

Table 2.1 - Relevant Legislation

Species Group/Species	Relevant Legislature	Level of Protection
Badger	Protection of Badgers Act (1992), Wildlife and Countryside Act (1981) (as amended)	Illegal to wilfully kill, injure or take a badger (or attempt to do so). Cruelly ill-treat a badger. Dig for a badger. Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it. Cause a dog to enter a badger sett. Disturb a badger when it is occupying a sett.
Bats	CRoW Act (2000) Conservation of Habitats and Species Regulations (2019) (EU Exit) Wildlife and Countryside Act (1981) (as amended)	All British bats and their roosts are afforded full protection from damage/destruction and bats may not be injured/killed/taken at any life stage. Once identified, roosts are protected whether the bat is in occupation or not.
Birds (Breeding)	CRoW Act (2000) Wildlife and Countryside Act (1981) (as amended)	All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected. Birds listed on Schedule 1 Wildlife & Countryside Act (1981) (as amended) are afforded a greater level of protection.

Great Crested Newt (GCN)	CRoW Act (2000) Conservation of Habitats and Species Regulations (2019) (EU Exit) Wildlife and Countryside Act (1981) (as amended)	Great Crested Newts (GCN's) are fully protected from disturbance, killing, injuring or possession at any life stage. Confirmed breeding ponds and resting places are afforded the same protection.
Invasive Plant Species	Wildlife and Countryside Act (1981) (as amended)	Species listed within Schedule 9 Wildlife and Countryside Act (1981) (as amended) as invasive, including Japanese Knotweed (*Reynoutria japonica*) and Himalayan Balsam (*Impatiens glandulifera*), The Act makes it an offence for any person to grow or cause to grow in the wild any plants listed as invasive.

Red Squirrel

2.4 Red squirrel (*Sciurus vulgaris*) is a priority species in the UK, and this species is also listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act, alongside being included in Schedules 5 & 6 of the Wildlife & Countryside Act (1981) (as amended). It is therefore an offence to intentionally kill / injure / disturb an individual from this species or to intentionally / recklessly damage or destroy any structure / place that is being used for shelter or protection.

Policy

2.5 Paragraph 180 of the National Policy Planning Framework (as revised in July 2021) states:

180. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons63 and a suitable compensation strategy exists; and,

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

2.6 Policy NH2 of Sefton's Local Plan states:

"Where it has been demonstrated that significant harm cannot be avoided, appropriate mitigation, replacement or other compensatory provision may be required, to accord with the hierarchy of sites" and *"Where significant harm resulting from development cannot be avoided, adequately mitigated, or as a last resort, compensated, then planning permission will be refused."*

The plan goes on to say:

"*Development proposals which affect sites of nature conservation importance, Priority Habitats, legally protected species or Priority Habitats must be supported by an Ecological Appraisal and include details of avoidance, mitigation and or/compensation, and management, where appropriate."*

3.0 Priority Habitats & Species

National context

3.1 In the United Kingdom, legal protection and otherwise legislative recognition is afforded to particular habitats and species. Certain habitats and species are considered to hold nature conservation importance and are thus protected due to factors such as their ecological functionality, their rarity, their vulnerability, environmental importance or declining population/status. They are referred to as priority habitats and priority species.

3.2 The UK Biodiversity Action Plan (UKBAP) provided a statutory basis for lists of habitats and species of national conservation importance - now transposed under section 41 (s.41) of the Natural Environment Rural Communities Act 2006 (NERC Act).

3.3 The following Priority habitats and species are considered relevant to the survey area:

Habitats:

- Habitats including Hedgerows and Arable field margins,
- Bats that include Noctule (*Nyctalus noctula*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*),
- Common toad (*Bufo bufo*) and Great Crested Newt (GCN) (*Triturus cristatus*),
- Bird species that include House Sparrow (*Passer domesticus*), Dunnock (*Prunella modularis*), Song Thrush (*Turdus philomelus*), and Bullfinch (*Pyrrhula pyrrhula*),
- Flora that includes Bluebell (*Hyacinthoides non-scripta*) and Purple Ramping-fumitory (*Fumaria purpurea*).

District context

3.4 Local Biodiversity Action Plans (LBAP's) are a way of encouraging people to work together and deliver a program of continuing action for biodiversity at a local level. LBAPs also embrace the idea of 'local distinctiveness'; habitats and species which are not considered UK conservation priorities can be catered for by LBAPs if they are of particular local significance.

LBAP's set out practical steps that aim to:

- Help protect biodiversity,
- Enhance and improve biodiversity where possible, and,
- Promote biodiversity at a local level

3.5 The North Merseyside Biodiversity Action Plan (NMBAP) lists key local habitats/species considered to be rare or declining in the area; some may be of national concern while others are significant at local level. The following local plans are considered of potential relevance to the survey:

- Coastal Sand Dune
- Bats (*Chiroptera spp.*)
- Bluebell (*Hyacinthoides non-scripta*)
- Sand Lizard (*Lacerta agilis*),
- Natterjack Toad (*Epidalea calamita*),
- Purple Ramping-fumitory (*Fumaria purpurea*),
- Red Squirrel (*Sciurus vulgaris*),
- Song Thrush (*Turdus philomelos*),
- Urban Birds – Inclusive of House martins (*Delichon urbicum*) & House Sparrows (*Passer domesticus*)

3.6 Red squirrels feature on the Merseyside LBAP; as a highly mobile and transient species they can regularly be found / seen in residential gardens in the Formby area, where they take advantage of abundant food sources such as bird feeders or specific food types which are left out in gardens. This can, however, lead to high levels of mortality in this species whereby they are predated by domestic cats or killed when crossing roads. Their breeding stronghold is situated in the coniferous plantations within Sefton Coast SSSI and associated designated sites, but numbers of Red squirrels have declined dramatically in recent years, with a smaller population more at risk from decline due to either being directly outcompeted for resources such as food and shelter by Grey squirrels (*Sciurus carolinensis*) or impacted by the disease carried by their competitors, the 'Squirrel pox virus'.

4.0 Survey Methods

4.1 As part of the Ecological Appraisal report, desk-top and field-based studies were conducted. Methods for both components of the appraisal are given below.

Desktop Study

4.2 Prior to a site visit a desktop study was conducted using online resources to obtain information pertaining to any sites afforded statutory (e.g. SSSI) and non-statutory (e.g. LWS) designations within 2.0km of the site boundary. To do so, the 'Multi Agency Geographic Information for the Countryside (MAGIC – provided by Defra)' along with data from the 'Natural England Open Data Geoportal' was accessed to gather such information; this interactive mapping service was also used to locate any European Protected Species Mitigation Licenses (EPSML) and species records to further inform conclusions concerning protected species in the context of the study site and its proposed development.

4.3 Historic satellite imagery was reviewed using sources such as Google Earth (© 2018-2022) to help establish past use of the land and determine the nature of adjoining and extending habitats; such information aids in the understanding of how the site might interact with its surroundings ecologically and its value in that context, and how the development may impact at a wider scale.

4.4 In addition the Council Planning Portal 'Search for planning applications' function was utilised to help inform the desktop study by analysis of existing publicly accessible ecological survey results that have been carried out locally within the previous five years.

4.5 A commercial data request to the Local Environment Records Centre (LERC) serving the area has not been sourced during this preliminary appraisal assessment and is justified through application of the following recent guidance:

1) The Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK (CIEEM, 2020) states: "It is generally expected that a desk study, including a data search, will be a key part of the ecological surveys or reports produced to inform a planning application. **Freely available web-based sources of data and contextual information should always be used**; in some cases, it may be acceptable to not undertake a data search with the LERC or other relevant NSS or local interest groups, for example:

*ii) Situations where the data search would be extremely unlikely to provide information needed to inform the assessment; due to the **scale** and **location** of the proposed development. The appropriateness of excluding a data search will need to be judged on a case-by-case basis as, in most situations, it will be essential to carry out such a search even if the development is very small or is likely to have a low impact. It can be very difficult to demonstrate that a data search would not have provided relevant information without obtaining and reviewing those data.*

iii) In some cases for Preliminary Roost Assessments of buildings in low impact / small-scale scenarios, such as an extension to a residential property, loft conversions (full or partial), installation of Velux/dormer windows, single modern agricultural or similar building conversion or demolition; however, it should not be assumed that data searches are never required for such scenarios and this must be judged on a case by case basis and justified accordingly.

2) The Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017) states: *"Very occasionally it might be possible to carry out a robust PEA without obtaining LERC/NBDC/CEDaR data; this will usually only apply to **low impact or small-scale projects** (e.g. by virtue of size, extent, duration of works, magnitude and locality), and should be determined on a case-by-case basis."*

As exemptions as made **bold** above can be applied for the proposed development in good practice due to the small scale the proposed development (<1ha), it is considered unnecessary to conduct a commercial data request at this time, however, if a data search is considered to be necessary by the Local Authority or advisory body to better inform the appraisal, a proportionate data search should be commissioned with results interpreted into the conclusions and recommendations of a re-issued/updated report.

Field Survey

4.6 A daytime preliminary ecological appraisal was conducted on 3rd October 2022 in dry conditions (15ºC), wind 2/12 (Beaufort scale), 90% cloud by the following surveyor (Table 4.1).

Table 4.1 - Surveyor credentials

Name	Description of relevant credentials
Mr. H. Mulligan	• Trainee Ecologist undergoing extensive training. • MBiolSci in Biological Sciences (Zoology) • Qualifying CIEEM

Floristic assessment

4.7 The survey followed the UK Habitat Classification Version 1.1 (Butcher, et.al., 2020) being introduced as part of the roll out of Biodiversity Net-gain with reference to the Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology standards (JNCC, 2010) and reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Technical Guidance Series "*Guidelines for Preliminary Ecological Appraisal*, *2nd Edition"* (CIEEM, 2017).

4.8 During the survey walkover, botanical assemblages were assessed, and the land was inspected for the presence of red-listed (Stroh *et al*, 2014; Hodgetts, 2011), s.41 and LBAP species alongside specially protected species as listed under Schedule 8 of the Wildlife and Countryside Act (WCA) (1981) (as amended) and / or Schedule 5 The Conservation of Habitats and Species (amendment) (EU exit) Regulations (2019). Species nomenclature follows Stace, C. (2019) – definitive English names for vascular plants, Smith, A. (2004) for mosses, and Dobson, F. (2018) for lichens.

4.9 In combination with assessing the area in relation to flora and habitats of conservation importance, the land was also assessed in relation to the presence of invasive non-native species (INNS) as listed under Schedule 9 (Part II) of the Wildlife and Countryside Act (1981) (as amended).

Faunal assessment

4.10 The identification and/or evidence of fauna encountered would be documented whilst in tandem the area was assessed for the potential to support the priority species covered in the previous tables. The 'walkover' also aimed to identify any ephemeral pools or unmapped waterbodies.

Bats

4.11 The site would be assessed for bats, buildings (where present) would be inspected for potential places that may be of value to bats and to determine evidence of use. This typically involves a search for potential roost features (PRF) both internally (investigation of loft spaces/upper floors/internal elevations) as well as externally, comprising an investigation of features (roof material, building components) using a high-powered torch. Field signs of bats typically comprise bat droppings, incidental animal presence, dead specimens and/or prey items. The surrounding habitat was also considered in terms of general suitability. One building is present within the site boundary.

4.12 Trees (where present) would be inspected for places that may be of value to bats and to determine if evidence of use was present; this typically involves a search for potential roost features along with an investigation of those features using a high-powered torch or close focus binoculars. Potential roost features can include woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed lifted bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy with stem diameters in excess of 50mm or bat/bird boxes. All trees present were inspected for their potential to host roosting bats.

4.13 Criteria for preliminary bat roost assessment are based upon the determinants given in the Bat Conservation Trust - Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd ed. (2016): (see Figure 4.2).

Table 4.1 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	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[a] 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[b]). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.[c]	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. 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.
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[a] 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 species conservation status, which is established after presence is confirmed).	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. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
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[a] and surrounding habitat.	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. 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. Site is close to and connected to known roosts.

[a] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
[b] 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 larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
[c] This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Figure 4.2 - *Bat Conservation Trust (BCT) guidelines extract*

4.14 Factors considered during the preliminary roost assessment include:

- Knowledge of bat species relevant to the site location and geographical range,
- Nature of the immediate / surrounding habitat in relation to foraging opportunities,
- Presence and conditions of loft spaces, upper floors, roof linings where present,
- Presence / absence of roost potential,
- Value of roost potential, if present.

Breeding Birds

4.15 Buildings, trees, hedges, and scrub (where present) would be checked for evidence of nesting birds and suitability for relevant species. Bird species observed and heard were recorded on site, and a search was made for nest material, or areas suitable for nesting. Additional to the site's capacity to support generally common species for breeding, the area was also subject to an assessment for the site's capacity to support species especially protected under Schedule 1 of the Wildlife & Countryside Act (1981) (as amended), for example Barn Owl (*Tyto alba*) and other priority species.

Other terrestrial mammals

4.16 The walkover included a search for field signs of Badger (*Meles meles*) which includes signs of activity such as digging, setts, 'runs' leading to and from a sett and the existence of latrines or 'snuffle' holes where badgers have foraged in the ground. Any signs indicative of use of the site by European Hedgehogs (*Erinaceus europaeus*), Brown Hare and Water Vole, or habitats of value to them, were also recorded.

Red Squirrel

4.17 The survey area was searched for evidence and suitability concerning Red squirrel as the site is located within their main North Merseyside stronghold area (see Figure 4.2), which is a region largely absent of Grey squirrel (*Sciurus carolinensis*). Gardens within the stronghold are commonly used as commuting routes by Red squirrels, whilst on rare occasions dreys have been found within garden conifers, though the main population thrives in the locally designated sites. The Ecologist therefore investigated the site for evidence of drey building by Red squirrels and assessed the likelihood of Red squirrel commuting through the site.

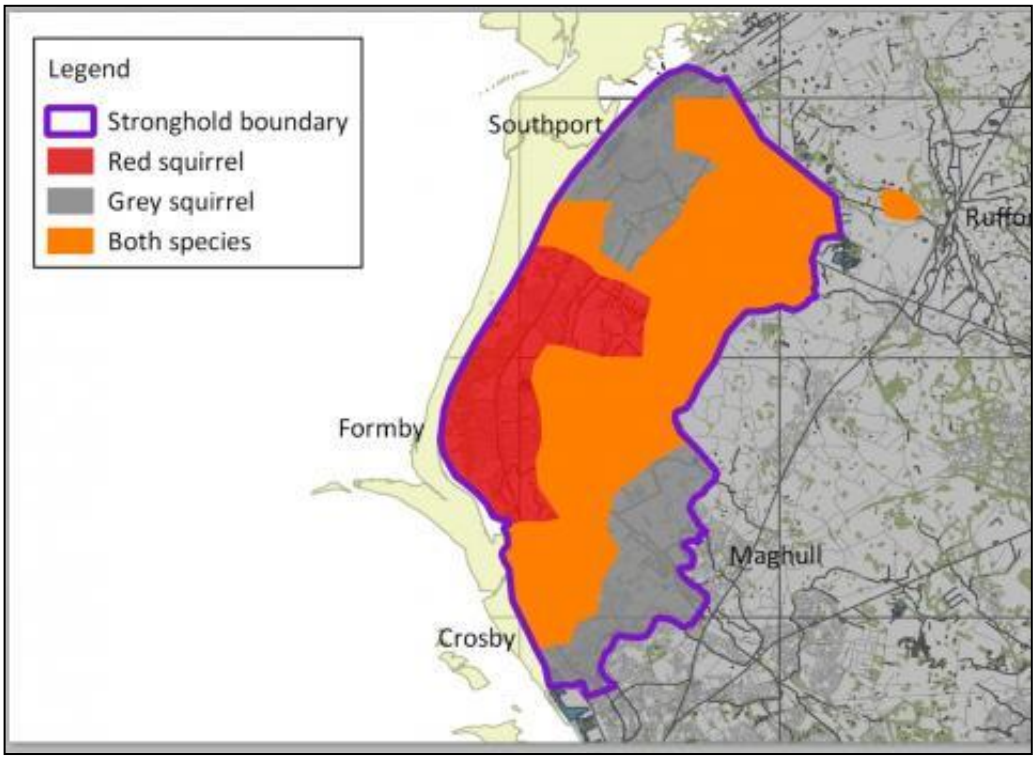


Figure 4.2 – *The Red Squirrel population boundary within the local North Merseyside stronghold (Source: Lancashire Wildlife Trust, N.D.)*

GCN

4.18 During a desktop assessment a 500m search was undertaken from a site-central grid reference in relation to the presence of ponds, ditches or other water bodies that may support Great Crested Newts (GCN). The information gathered would then be used to aid in establishing if more detailed surveys are required.

NB: *English Nature's (now Natural England) Great Crested Newt Mitigation Guidelines (2001) states ponds within 500m of a proposed development site should be considered for their potential to support GCN, however, in some instances this distance may be reduced to 250m due to the presence of physical barriers and obstructions or based on the likely magnitude of impacts arising from the proposed development.*

4.19 Based on the small scale (<1 hectares) of the development and using best practice guidance, a 250m buffer was used. No ponds are present within the site, nor within 250m of the site.

4.20 The site and its surroundings were assessed for suitability for use by reptiles, with particular attention paid to features that could be used as basking areas (*e.g.* south-facing slopes), hibernation sites (*e.g.* banks, walls, piles of hardcore) and opportunities for foraging (*e.g.* rough grassland and scrub). Beebee & Griffiths (2000) state specific habitat preferences of common UK reptiles:

- Common Lizards (*Zootoca vivipara*) use a variety of habitats from woodland glades to heaths, walls and pastures, as well as brownfield sites,
- Slow-worms (*Anguis fragilis*) use similar habitats to Common Lizards, and are often found in rank grassland, gardens and derelict land under refugia,
- Grass Snakes (*Natrix natrix*) have broadly similar requirements to Common Lizards but with a greater reliance on ponds and wetlands, where they prey on amphibians.

In assessment of a site for reptiles important habitat characteristics are considered, outlined in Table 4.2, as derived from the Reptile Habitat Management Handbook (Edgar, 2010).

Table 4.2 - Important habitat characteristics for reptiles

1. Location (in respect of species range)	7. Connectivity to good quality habitat
2. Vegetation structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

4.21 The application site was assessed for the presence of features that should be considered of high value to invertebrates. A number of important features were considered, based on the assemblage descriptions provided within the Research Report "Surveying terrestrial and freshwater invertebrates for conservation evaluation" (NERR005, 2007), including but not limited to:

- Wood decay
- Early successional mosaic habitat
- Shaded ground layer
- Still and flowing water

4.22 The results, conclusions and recommendations of this report are based on a number of factors i.e.

- Skills and experience of the surveyor,
- Knowledge of flora and fauna relevant to the site location and geographical range,
- Nature of the immediate and surrounding habitat in relation to shelter, foraging and commuting opportunities.

4.23 The results, conclusions and recommendations of this report have been assessed by Mrs. K. Wilding, Director of Tyrer Ecological Consultants Ltd, and her assessment concurs with the findings and recommendations of Mr. H. Mulligan.

5.0 Limitations

5.1 This report does not contain a comprehensive list entailing the totality of botanical taxa on site. Species listed within Appendix II are recorded from a combination of the seasonal timing the survey took place and botanical identification skills of the surveyor. Many plant species are only evident at certain times of the year; consequently, it is possible that some plant species may have gone undetected.

5.2 The optimal time of the year to carry out a preliminary ecological appraisal / UK Habitats survey is April to October; therefore, the survey was undertaken within the optimal period.

5.3 No other access limitations were experienced on site with permission granted to the surveyor to access all important areas. Taking everything into consideration no significant limitations affected the survey effort that would affect the results, conclusions, and recommendations in this report.

6.0 Desk Study Results

6.1 The application site (circa 0.1 hectares) is situated to the west of College Avenue and south of The Evergreens in Formby, close to the town centre.

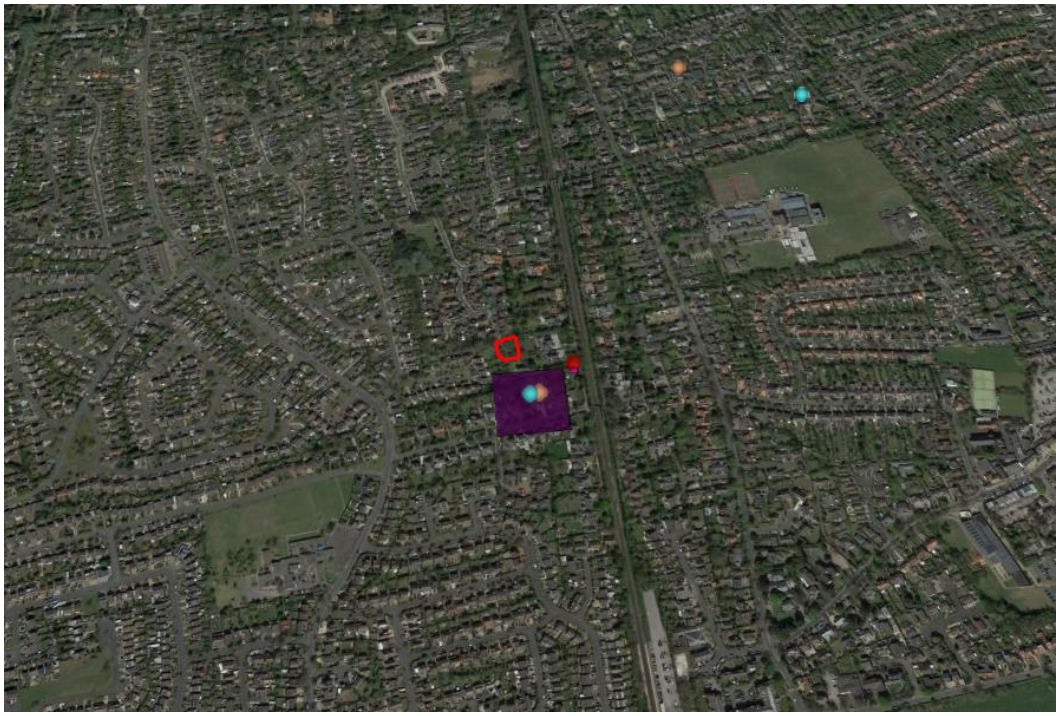


Figure 6.1 - *Location of application site (red boundary) within the surrounding landscape (Source: Google 2021)*

6.2 The application site can be described as a patch of disused grassland, surrounded by residential developments in all directions, with several rear gardens of nearby properties bordering the site to the south, east and west, and The Evergreens bordering the site to the north.

6.3 The immediate habitat is distinctly suburban, with typical associated infrastructure such as a number of large residential properties, each with extensive landscaped gardens with manicured lawns and linear hedgerows / trees. Typical amenities such as pharmacies, shops, schools and restaurants also lie close to the site.

6.4 The extending environment is largely similar to that of the immediate, with sub-urban infrastructure present in all directions, with further large residential properties and gardens, which are served by various amenities such as small supermarkets, pubs, restaurants and sports centres. Natural and semi-natural environs extend beyond the residential developments to the north and west, with Formby Golf Club lying to the north comprised of areas of coastal sand dunes and lowland dry acid grassland interspersed with small areas of shrub and woodland, while to the west there is multiple designated sites along the coastline and expanses of priority habitats and dune complexes in varying stages of succession.

6.5 The site's suburban nature means that there is poor connectivity between the site and natural environments in proximity for slow-moving terrestrial fauna, however there are no obstacles that would prevent free movement for flying or faster moving terrestrial fauna and nearby woodlands are considered to offer high quality foraging for bats.

6.6 The described ecological frameworks are considered to offer an array of habitats with reasonable inter-connectivity in the landscape and to the application site, which is of benefit to a number of species/groups for which the survey was undertaken, namely flying animals such as bats and birds associated with rural settings along with a variety of small terrestrial mammals.

6.7 The protected species most typically associated with the habitats described is the Common Pipistrelle (*Pipistrellus pipistrellus*), frequently associated with buildings in rural and urban environments.

6.8 There are four statutory designated sites within 2.0 kilometres of the application site, with two of these having multiple designations (Table 6.1):

Site name	Designation type	Interest features
Ainsdale Sand Dunes (1.85 kilometres north)	National Nature Reserve (NNR)	A 491 hectare site, where the dunes are home to over 450 plant species including 33 which are locally or regionally rare, such as: Petalwort (*Petalophyllum ralfsii*), Seaside Centaury (*Centaurium littorale*), Yellow Bartsia (*Parentucellia viscosa*), Round-Leaved Wintergreen (*Pyrola rotundifolia*), Dune Helleborine (*Epipactis dunensis*) and Pendulous-flowered Helleborine (*Epipactis phyllanthes*). This is one of the best remaining strongholds of the rare Natterjack Toad (*Epidalea calamita*), Europe's loudest amphibian. Red Squirrels (*Sciurus vulgaris*) can be seen amongst the reserve's pine forests too, while Sand Lizards (*Lacerta agilis*), Great-crested Newts (*Triturus cristatus*) and a fantastic variety of orchids and other wildflowers can also be found here.
Ribble & Alt Estuaries (1.01 kilometres west)	RAMSAR site Special Protection Area (SPA)	A 13,488 hectare site including two estuaries which form part of the chain of west coast sites which fringe the Irish Sea. The site is formed by extensive sand and mudflats backed, in the north, by the saltmarsh of the Ribble Estuary and, to the south, the sand dunes of the Sefton Coast. The tidal flats and saltmarsh support internationally important populations of waterfowl in winter and the sand dunes support vegetation communities and amphibian populations of international importance. Designation species are natterjack toads (*Bufo calamita)*, winter bird assemblages of international importance and wetland bird species occurring at populations of international importance.
Sefton Coast	Site of Special Scientific Interest (SSSI)	A 4605 hectare site designated for its range of rare, coastal habitats. The area is host to a large number of

(0.77 kilometres west)	Special Area of Conservation (SAC)	nationally and internationally important plant species including nationally rare Grey Hair-grass (*Corynephorus canescens*), Petalwort and nationally rare Dune Wormwood (*Artemisia campestris ssp. maritima*). The site also holds internationally important populations of wintering birds, and also nationally / internationally important populations of individual waders, with species including Sanderling (*Calidris alba*), Ringed Plover (*Charadrius hiaticula*) and Bar-tailed Godwit (*Limosa lapponica*). Rare fauna such as Sand Lizard, Natterjack Toads and Great-crested Newts can also be found here, alongside the Red Data Book species Sandhill Rustic Moth (*Luperina nickerlii gueneei*). Annex I habitats which are a primary reason for this sites SAC designation are: Embryonic shifting dunes; Shifting dunes along the shoreline with *Ammophila arenaria* ('White dunes'); Fixed coastal dunes with herbaceous vegetation ('grey dunes') Dunes with *Salix repens ssp. Argentea (Salicion arenariae);* Humid dune slacks.
Ravenmeols Hills (1.82 kilometres south-west)	Local Nature Reserve (LNR)	A 74.4 hectare site characterised by a high mobile dune ridge with smaller embryo dunes next to an expansive and largely undisturbed beach. The dunes have been altered by sand extraction, leaving one of the largest blow-outs in the UK. The lowest point of this has developed into wet slack. The dunes are an important site for Natterjack Toads.

Desktop study - Species records

6.9 **Bats:** Eight European Protected Species Mitigation Licences (EPSML) has been granted in relation to bats within 2.0km of the site boundary pertaining to breeding and non-breeding roosts of Brown Long-eared (*Plecotus auritus*) and Common Pipistrelle (*Pipistrellus pipistrellus*) bats.

6.10 **Great Crested Newt:** No EPSMLs or Present' Class Survey Licence Returns in relation to GCN have been granted within 2.0km of the survey boundary.

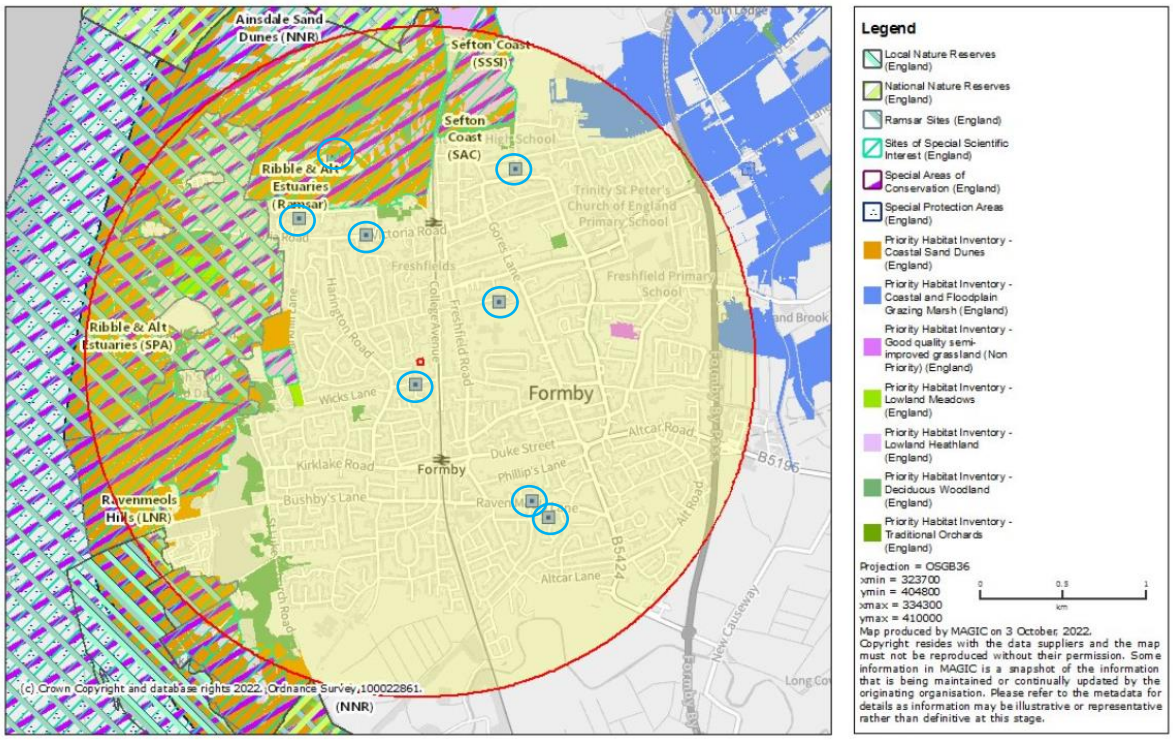


Figure 6.2 – *Location of granted EPSML (blue ringed), priority habitats and designated sites relative to the application site (Source: adapted from MAGIC Maps, 2022)*

7.0 Field Survey Results

7.1 Habitat Survey

7.1.1 See Table 7.1 (below) for habitat descriptions. Refer to Appendix IV - UK Habitats Map for the location of all described habitats & Target Notes (TN). Species nomenclature follows Stace, C. (2019) – definitive English names.

Table 7.1 - UK Habitats recorded within the survey area with target notes

Habitat	Description
u1c – Artificial unvegetated unsealed surface 16 – Tall herb 17 - Ruderal / ephemeral	The application site comprises of a large patch of cleared land, now heavily overgrown with tall ruderal/ephemeral species, dominated by Common Nettle (*Urtica dioica*), Willowherb sp. (*Epilobium sp*.) and Creeping Thistle (*Cirsium arvense*), with patches of grasses such as Cocks-foot (*Dactylus glomerata*), Yorkshire Fog (*Holcus lanatus*) and False Oat-grass (*Arrhenatherum elatius*).
u1b5 – Buildings	A small timber shed is located at the north-west of the site (see section 7.3 for full description).
w1g6 – Line of trees	There is a line of Sycamore (*Acer pseudoplatanus*) trees at the north of the site, with most of these covered heavily in Ivy (*Hedera helix*).
u1e – Built linear feature 69 - Fence	The site is surrounded by heras fencing along its northern boundary, and wooden fencing to the east, south and west.

7.1.2 No species of conservation importance or species listed as invasive under Schedule 9 of the WCA were identified anywhere within the site boundary.

7.2 Vegetation

7.2.1 No species of conservation importance or listed as invasive under Schedule 9 of the WCA were recorded on or adjacent to the application site.

7.3 Bats

7.3.1 The only building present on site is a small timber shed with a pitched asbestos roof. Internally the building is open to the eaves, is bright, cool, draughty and heavily cobwebbed, while also lacking a roof lining. Externally the building is well sealed and provides no ingress opportunities for crevice dwelling bats of the *Pipistrellus* genus. The building is also considered to be unsuitable for the breeding purposes of loft-dwelling bat species such as the Brown Long-eared (*Plecotus auritus*), which prefers dark, warm loft spaces; no evidence to suggest such use or more occasional use by singular or low numbers of bats was identified anywhere within the loft-spaces despite a meticulous search with a high-powered torch.

7.3.2 On the basis of the character of the building as described, the lack of ingress points and PRFs, the building has been duly categorised as pertaining to 'Negligible**'** bat roost suitability in line with current BCT guidance.

***NB**: The breeding roosts of Pipistrelle bats are proportionally higher in occupied residential dwellings were the warm, dry conditions favour the requirements of a maternity colony but other structures are also used, especially for hibernation or by male bats which do not need the same conditions as a maternity colony.*

Trees

7.3.3 An assessment of all mature and semi-mature trees at the site found them to absent of any extensive rot holes, cracks, woodpecker holes, peeling bark, splits or other crevices typically used by bats; and have all been duly categorised as pertaining to 'Negligible' bat roost suitability.

7.4 Breeding Birds

7.4.1 In relation to Schedule 1 (WCA) specially protected bird species such as Barn owl, whilst this species may be present in the wider area with hunting habitat provided in the surrounding arable fields and open grasslands, no suitable nesting habitat is present at the site and the proposed application is unlikely to impact upon such species.

7.4.2 In relation to common bird species, no evidence of nesting was discovered within the red line boundary as a whole. The site does, however, support a range of mature shrubbery within the vicinity of the proposed works that would provide a plethora of suitable nesting platforms for common bird species, particularly during the breeding bird season. The nesting bird season is weather dependent but generally extends between March and September inclusive (peak period March-August).

7.5 Other Terrestrial Mammals

Badger

7.5.1 No field signs were located to indicate the presence of Badgers, including any setts, latrines, pathways, hairs, footprints or feeding signs such as snuffle holes and scratched trees/logs; no suitable habitat for sett building is present at the application site and their presence within the site boundary is thus highly unlikely.

European Hedgehog

7.5.2 In relation to European Hedgehog, the grassland habitats present offers foraging and commuting habitat in their current state, the hedgerows may provide some suitability for shelter and hibernation due their overgrown nature, thus the presence of this species throughout the year is considered possible.

Red Squirrel

7.5.3 The presence of trees on site could provide a commuting corridor for Red Squirrel; many gardens in Formby have linear vegetated features and so are of value to this species. No physical evidence of activity was located during the appraisal, which may include feeding remains, droppings and / or a drey. Given that Red Squirrels are more typically associated

with coniferous plantations, the potential for usage of the site is minor with relatively few links to coniferous woodland in the wider landscape.

7.6 Herptiles

GCN

7.6.1 In order to assess risk to GCN, a number of factors need to be considered. These include:

- Site proximity to a potential breeding pond and to any additional ponds,
- Habitat linkage / barriers between potential breeding ponds and the site,
- Nature and extent of available terrestrial habitat (50-100m) around the pond(s),
- Area of site habitat loss and permanence of that loss,
- Nature of habitat to be lost and its potential value to GCN as refuge/overwintering habitat.

7.6.2 As derived from the desktop assessment evidence of GCN in the locale included:

- No granted EPSMLs or 'Present' Class Survey Licence Returns for GCN within 2.0km of the site,
- No ponds within the site boundary or 250m of the site.
- Poor connectivity to the site from nearby semi-natural environs.

7.6.3 The habitat on site is broadly unsuitable for this species, consisting primarily of overgrown scrub and an absence of ground-level refuge opportunities; the presence of GCN within the site boundary is highly unlikely.

Other Herptiles

7.6.4 Similarly even more common robust amphibians such as Common Frog (*Rana temporaria*) and Common Toad (*Bufo bufo*) would struggle to access the site, and furthermore there is an absence of suitable potential breeding ponds in the wider area that would support a population of either species; the presence of common amphibians at the application site is considered unlikely.

7.6.5 In respect to reptiles, whilst the dense scrub nearby and bare ground on site provides foraging and basking opportunities, taking into account the sub-urban location of the site, the presence of any such species is unlikely.

7.7 Invertebrates

7.7.1 An assessment of habitats and features on site found a lack of ecotones present, with few other on-site features likely to provide habitat for a variety of invertebrates. The application site is therefore unlikely to be of local significance to invertebrate assemblages, and specially protected invertebrates are unlikely to be present.

8.0 Conclusions & Recommendations

Habitats & Vegetation

8.1 No habitats of conservation importance were identified on the application site.

8.2 No botanical species of conservation were identified within the site boundary and no further recommendations are applied at this time.

8.3 To improve the value of the site for native wildlife, a list of appropriate native species that might be incorporated into the proposed development has been supplied (see Appendix III).

Bats

8.4 Based upon the findings of the survey, covered through sections 6.0 – 7.0 of the report and supported by Appendix I, the land to the rear of College Avenue is determined to offer '**Negligible**' bat roost potential in accordance with Bat Conservation Trust – Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd ed. (2016); no further surveys are required in relation to bats, with general enhancement measures recommended in Appendix II.

Table 4.1 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.

Figure 8.1 – *Bat Conservation Trust extract on Negligible roost potential requirements*

8.5 Bats are a transient species and buildings can deteriorate over time. In the highly unlikely event that bat(s), or evidence of bat(s), are found during the proposed works, then, as a legal requirement, the work at the site should immediately cease and an Ecologist should be contacted for further advice. If bat(s) or their roost(s) will be affected, then an EPSML may be required to legally commence with the works. See **Figure 8.2** for indicative evidence of bats.

Figure 8.2 – *Evidence of bats – droppings on the left / a Common Pipistrelle bat on the right – indicative*

8.6 No recommendations are necessary in relation to bats and trees, as the trees on site are not adjudged to offer any roosting potential for bats, with a distinct lack of any suitable locations such as: woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed lifted bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy with stem diameters in excess of 50mm or bat/bird boxes.

8.7 Installation of overly harsh artificial lighting as part of any development that exceeds current levels may have a negative impact upon foraging/commuting bats in the landscape, particularly if increased light spillage occurs in areas of that are currently free from illumination. A bat-sensitive lighting plan is therefore recommended in order to avoid potential impacts to bats that may use the surrounding treelines. Several options to consider have been listed below, though the reader is referred to the Bat Conservation Lighting Guidelines for further information.

<u>Appropriate luminaire specifications:</u> Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires.

All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used. LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. Lighting should be directed to where it is needed, and light spillage avoided. This can be achieved by the

design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier.

Predicting where the light cone and light spill will occur: There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process.

Light levels: The light should be as low as guidelines permit. If lighting is not needed in any particular area, do not light. Numerous software programmes are currently available which can be used inform lighting plans, demonstrating how lighting decisions will illuminate a site.

Please refer to the 'Landscape and urban design for bats and biodiversity' (*Gunnell et. al.*, 2012, Bat Conservation Trust) Guidance Note 8 'Bats and Artificial Lighting' 2018, Bat Conservation Trust for further information.

Breeding Birds

8.8 In relation to common birds the shrubs and trees present could offer small birds nesting habitat, particularly during the breeding bird season, however no evidence of breeding birds was encountered during the survey.

8.9 In the interests of potential impact avoidance it is recommended that proposed works to the vegetation within the site boundary should be undertaken outside of the nesting bird season. The nesting bird season is weather dependent but generally extends between March and September inclusive (peak period March – August). For works within the breeding bird season, any areas that can support nesting birds should be checked by a professional Ecologist for nesting birds within 48 hours or less prior to works commencing. If birds are found nesting any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally, for example via the implementation of an appropriate buffer zone (species dependent) around the nest in which no disturbance is permitted until the nest is no longer in use.

Terrestrial Mammals

8.10 No field signs were located to suggest the presence of Badgers, and no further surveys are required nor impacts likely to occur to this species.

8.11 In relation to Hedgehog, habitats present offer high suitability for discrete foraging, territory marking, rest, shelter and hibernation, and the likelihood of Hedgehogs using the site is high. Their potential presence at the site during the course of the works cannot be discounted; it is therefore recommended that a working Method Statement detailing Reasonable Avoidance Measures (RAMs) is created by a suitably experienced ecologist to reduce the risk of harming small mammals or other terrestrial fauna during the construction phase of the proposed development.

8.12 The proposed works, in their current form, are unlikely to have an adverse impact upon Red squirrels, although the potential of this species utilising this site for commuting purposes cannot be ruled out. Before any of the trees on site are felled, then a pre-commencement check should be carried out prior to removal. If Red squirrels are found during the check,

then an ecologist should be contacted to provide further guidance, which may involve a further site visit to appraise the situation and provide recommendations.

Herptiles

8.13 There are no ponds present within the site boundary or within a 250m buffer, and no granted EPSMLs or 'Present' Class Survey Licence Returns within a 2.0km buffer; there is poor connectivity to the site and the terrestrial habitat present is not favourable for this species. There are no further surveys or recommendations in relation to GCN. The presence of even common robust amphibian species such as Common Frog and Common Toad is similarly considered unlikely, and reptiles are unlikely to access or be present at the site. No further surveys are required with regards to herptiles.

Invertebrates

8.14 No impacts to local populations of invertebrates are foreseen; no further surveys and no mitigation is recommended however enhancement measures for invertebrates are provided within Appendix III.

9.0 Bibliography

- **Baker, J., Beebee, T., Buckley, J., Gent, T. and Orchard, D.** 2011. *Amphibian Habitat Management Handbook*. Amphibian & Reptile Conservation, Bournemouth.

- **Beebee, T. & Griffith, R**. 2000. *Amphibians and Reptiles.* Collins

- **Bat Conservation Trust (BCT)**, 2018. *Bats and artificial lighting in the UK: Bats and the Built Environment series*. Available from: www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

- **British Standards Institution (BSI)**. 2012. Trees in relation to design, demolition and construction - recommendations. BS 5837:2012. ISBN 978 0 580 69917 7.

- **BSBI**, 2020. *BSBI Maps*. Available from: www.bsbi.org/maps

- **CIEEM**, 2016. *Guidelines for Ecological Impact Assessment in the UK and Ireland*, 2nd edition. Available from: www.cieem.net/data/files/Publications/EcIA_Guidelines_Terrestrial_Freshwater_and_Coastal_Jan_2016.pdf

- **CIEEM**. 2020. Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK. 2nd Edition. Chartered Institute of Ecology and Environmental Management. Winchester, UK

- **CIEEM**, 2017. *Guidelines for Preliminary Ecological Appraisal*, 2nd edition. Available from: www.cieem.net/data/files/Publications/Guidelines_for_Preliminary_Ecological_Appraisal_Jan2018_1.pdf

- **CIEEM**, 2019. *Biodiversity Net Gain: Good practice principles for development*. Available from: www.cieem.net/data/files/Publications/Biodiversity_Net_Gain_Principles.pdf

- CIEEM. 2020. Advice on Covid-19 and Undertaking Site-Based Ecological Work. Available Online - https://cieem.net/wp-content/uploads/2020/03/CIEEM-COVID-19-Advice-31March2020-FINAL.pdf

- **Chorley Council, Preston City Council, and South Ribble Council,** 2015. *Central Lancashire Biodiversity and Nature Conservation Supplementary Planning Document.* Available from: https://centrallocalplan.lancashire.gov.uk/media/1049/july-2015-biodiversity-and-nature-conservation-spd-v1.pdf

- **Collins, J** (ed.), 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, 3rd edition. The Bat Conservation Trust, London.

- **Communities & Local Government (C&LG)**, 2019. *National Planning Policy Framework*. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

- **Dean. M; Strachen. R; Gow. D; Andrews. R**, 2016. *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).* The Mammal Society, London.

- **DEFRA**, 2018. *Net gain: Consultation Proposals*. Available from: https://consult.defra.gov.uk/land-use/net-gain/supporting_documents/netgainconsultationdocument.pdf

- **Dobson. F,** 2018. *Lichens: an Illustrated Guide to the British and Irish Species (7th edition*). Richmond Publishing, Slough and British Lichen Society.

- **Drake. C, Lott. D, Alexander. K and Webb. J,** 2007. Surveying terrestrial and freshwater invertebrates for conservation evaluation. Available from: http://publications.naturalengland.org.uk/publication/36002

- **European Commission (EC).,** 2013. Interpretation Manual of European Union Habitats. Available from: https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf

- **Edgar, P., Foster, J. and Baker, J**. 2010. *Reptile Habitat Management Handbook*. Amphibian & Reptile Conservation. Bournemouth.

- **English Nature**, 2001. *Great Crested Newt Guidelines. Version Aug 2001.*

- **Froglife**, 2015. *Surveying for reptiles*. Available from: https://www.froglife.org/wp-content/uploads/2013/06/Reptile-survey-booklet-3mm-bleed.pdf

- **Global Biodiversity Information Facility (GBIF)**, 2019. Available from: https://www.gbif.org/.

- **GOV.UK**. 2015. *Reptiles: surveys and mitigation for development projects.* Available online www.gov.uk/guidance/reptiles-protection-surveys-and-licences.

- **Gunnell, K. Grant, G. and Williams, C.** 2012. '*Landscape and urban design for bats and biodiversity*'. Bat Conservation Trust.

- **Joint Nature Conservancy Council (JNCC)**, 2010. *Handbook for Phase 1 habitat survey.* Available from: http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf

- **JNCC.,** 2016. UK Biodiversity Action Plan Priority Habitat Descriptions Coastal Sand Dunes. Available from: https://data.jncc.gov.uk/data/4b9e595b-c337-48c7-9880-b1611d02acbb/UKBAP-BAPHabitats-09-CoastSandDunes.pdf

- **Magic Maps Application**, 2020. Available from: www.natureonthemap.naturalengland.org.uk/MagicMap.aspx

- **Mitchell-Jones, A. J. (ed.)**, 1987. *The bat worker's manual*. Dept. BWM, Nature Conservancy Council, Northminster House, Peterborough, PE1 1UA

- **Mitchell-Jones, A. J.**, 2004. *Bat mitigation guidelines*. External Relations Team, English Nature, Northminster House, Peterborough, PE1 1UA.

- **Natural England**, 2015. *Great Crested Newts: Surveys and mitigation for developments and projects*. Available from: https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects.

- **North West Biodiversity Audit Group (NWBAG)**, 1999. *A biodiversity audit of north-west England*

- **Oldham R.S.; Keeble J.; Swan M.J.S.; Jeffcote M**., 2000. *Evaluating the suitability of habitat for the Great Crested Newt* (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

- **Rodwell, J. S. (ed.).,** 2000. British Plant Communities Volume 5 Maritime communities and vegetation of open habitats. Cambridge University Press, Cambridge.

- **Rose. F, 1999.** *Indicators of ancient woodland: The use of vascular plants in evaluating ancient woods for nature conservation.* Available from: http://pad.basingstoke.gov.uk/documents/4753/01/02/76/01027625.PDF

- **Sewell, D; Griffiths, R.A; Beebee, T.J; Foster, J; Wilkinson, J. W**., 2013. *Survey protocols for the British herpetofauna*. Available from: http://www.narrs.org.uk/documents/Survey_protocols_for_the_British_herpetofauna.pdf

- **Smith. A**, 2004. *The Moss Flora of Britain and Ireland*. Cambridge University Press, The Edinburgh Building, Cambridge, CB2 2RU.

- **Smith. P & Lockwood P,** 2021. *Vascular flora of two scrub-cleared slacks at Hightown sand-dunes, Merseyside; 2020 update*. Privately published.

- **Stace. C**, 2019. *New Flora of the British Isles*, 4th edition. Cambridge University Press, The Edinburgh Building, Cambridge, CB2 2RU.

- **Strachen. R; Moorhouse. T**., 2011. *The Water Vole Conservation Handbook*, 3rd ed. Wildlife Conservation Research Unit, University of Oxford.

- **Stroh. P. A; Leach. S. J; August. T. A; Walker. T. J; Pearman. D. A; Rumsey. F. J; Harrower. C. A; Fay. M. F; Martin. J. P; Pankhurst. T; Preston. C. D; Taylor. I**., 2014. *A Vascular Plant Red-List for England*, 2nd edition. Trollius Publications.

Appendix I: Site Photographs

Plate 1: Character of the site viewed from the north

Plate 2: Eastern boundary of the site

Plate 3: Southern boundary of the site

Plate 4: Eastern boundary of the site

Plate 5: Line of Sycamore trees at north of site

Plate 6: Character of small timber shed

Plate 7: Internal character of shed

Plate 8: Internal character of shed continued

Plate 9: Open drain at south of site

Plate 10: Example of piles of refugia on site

Appendix II: Site-Specific Botanical Species List

Each species recorded was given an abundance value according to the standard DAFOR scale, where:

- D = Dominant
- A = Abundant
- F = Frequent*
- O = Occasional*
- R = Rare*

*These values can be prefixed by the letter L (locally) to provide more subtle biogeographical data.

Taxon	Common Name	Scientific Name	DAFOR
Bryophyta (Mosses)	Springy Turf-moss	*Rhytidiadelphus squarrosus*	R
Anthophyta (Flowering plants)	Broad-leaved Bamboo sp.	*Sasa sp.*	R
	Bramble	*Rubus fruticosus agg.*	O
	Broad-leaved Dock	*Rumex obtusifolius*	O
	Cherry sp.	*Prunus sp.*	O
	Cleavers	*Galium aparine*	R
	Cocks-foot	*Dactylis glomerata*	F
	Common Foxglove	*Digitalis purpurea*	R
	Common Ivy	*Hedera helix*	LF
	Common Nettle	*Urtica dioica*	A
	Common Ragwort	*Senecio jacobaea*	O
	Common Sowthistle	*Sonchus oleraceus*	O
	Crane's-bill sp.	*Geranium sp.*	O
	Creeping Buttercup	*Ranunculus repens*	F
	Creeping Thistle	*Cirsium arvense*	F
	Daisy	*Bellis perennis*	O
	Dandelion	*Taraxacum agg.*	O
	False Oat-grass	*Arrhenatherum elatius*	F
	Fescue sp.	*Festuca sp.*	R
	Greater Plantain	*Plantago major*	O
	Herb Robert	*Geranium robertianum*	R
	Holly	*Ilex aquifolium*	
	Horseweed	*Erigeron canadensis*	A
	Meadow Buttercup	*Ranunculus acris*	O
	Purple Toadflax	*Linaria purpurea*	F
	Ribwort Plantain	*Plantago lanceolata*	O
	Rose Campion	*Silene coronaria*	R
	Spotted Ladysthumb	*Persicaria maculosa*	R
	Sunflower sp.	*Helianthus sp.*	O
	Sycamore	*Acer pseudoplatanus*	LF

	Toad Rush	*Juncus bufonius*	R
	Wild Angelica	*Angelica sylvestris*	F
	White Clover	*Trifolium repens*	LF
	Willowherb sp.	*Epilobium sp.*	F
	Yorkshire Fog	*Holcus lanatus*	A

Appendix III: Biodiversity Enhancement

Native Planting and/or Landscaping - recommended species

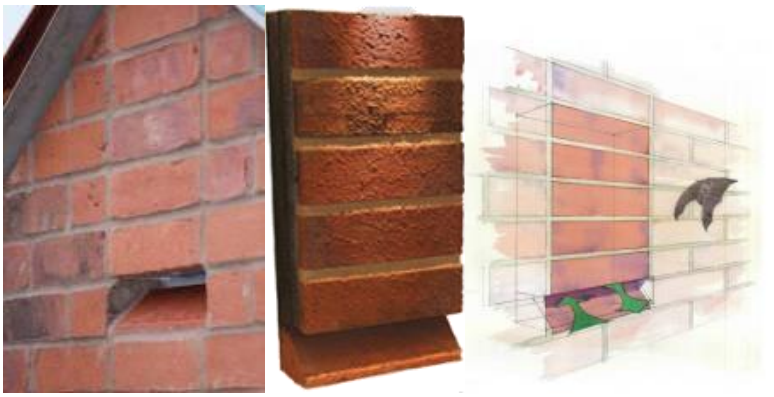
The below species have been assessed against the local soil and habitat types and are deemed suitable for the site.
All plant material should comply with the minimum requirements in BS 3936-1: 1992 Specification for trees and shrubs and BS 3936-4: 2007 Specification for forest trees and BS 8545: 2014 Trees from Nursery to Independence in the Landscape. Any plant material, which in the opinion of the appointed Landscape Architect, does not meet the requirements of the Specification, or is unsuitable, or defective in any other way, will be rejected. The minimum specified sizes in the plant schedule will be strictly enforced. The contractor should replace all plants rejected at own cost.

	Common Name	Scientific Name	Planting Preference
Ferns	Male Fern	*Dryopteris filix-mas*	Semi-shade or shaded
	Soft Shied-fern	*Polystichum setiferum*	Semi-shade or shaded
	Maidenhair Fern	*Adiantum capillus-veneris*	Suitable for rockeries / walled gardens
	Royal Fern	*Osmunda regalis*	Full sun in moist-damp areas
Herbaceous plants	Bloody Crane's-bill	*Geranium sanguineum*	Dry soils - suitable for rockeries
	Columbine	*Aquilegia vulgaris*	Semi-shade or open areas
	English Bluebell	*Hyacinthoides non-scripta*	Moist soils in semi-shade or open areas
	Giant Bellflower	*Campanula latifolia*	Semi-shade or open areas
	Greater Knapweed	*Centaurea scabiosa*	Dry-moist soils. Suitable for borders
	Greater Woodrush	*Luzula sylvatica*	Moist soils in semi-shade or open areas
	Meadow Crane's-bill	*Geranium pratense*	Humid-moist soils. Suitable for borders
	Musk Mallow	*Malva moschata*	Dry-moist soils. Suitable for borders and rockeries
	Sea Campion	*Silene uniflora*	Dry soils - suitable for rockeries
	Stinking Hellebore	*Helleborus foetidus*	Semi-shade or open areas
Climbers	Honeysuckle	*Lonicera periclymenum*	Dry-moist soils
	Hops	*Humulus lupulus*	Dry-moist soils
	Ivy	*Hedera helix*	Dry-moist soils
	Sweet-briar	*Rosa rubiginosa*	Dry-moist soils
Woody Shrubs	Blackthorn	*Prunus spinosa*	-
	Dogwood	*Cornus sanguinea*	-
	Guelder Rose	*Vibernum opulus*	-
	Hawthorn	*Crataegus monogyna*	-
	Hazel	*Corylus avellana*	-
	Holly	*Ilex aquifolium*	-
Trees	Alder Buckthorn	*Frangula alnus*	-
	Osier	*Salix viminalis*	-
	Pedunculate Oak	*Quercus robur*	-
	Purple Willow	*Salix purpurea*	-
	Rowan	*Sorbus aucuparia*	-
	Silver Birch	*Betula pendula*	-
	Wild Cherry	*Prunus avium*	-
Aquatic/marginal plants	Common Water-crowfoot	*Ranunculus aquatilis*	Ponds
	Marsh Marigold	*Caltha palustris*	Marginal vegetation
	Ragged Robin	*Silene flos-cucculi*	Marginal vegetation
	Water Mint	*Mentha aquatica*	Marginal vegetation
	Water-violet	*Hottonia palustris*	Ponds
	White Water-lily	*Nymphaea alba*	Ponds

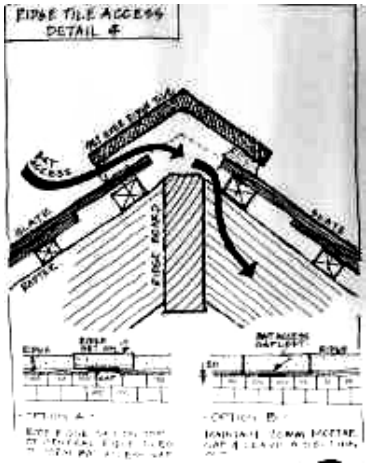
Enhancing a development site for Bats

Integrated bat box

The Habibat Bat Box is a solid box made of insulating concrete with internal roosting space. The box blends seamlessly into brick-built properties and may be incorporated into the fabric of buildings, being best placed on gable elevations.



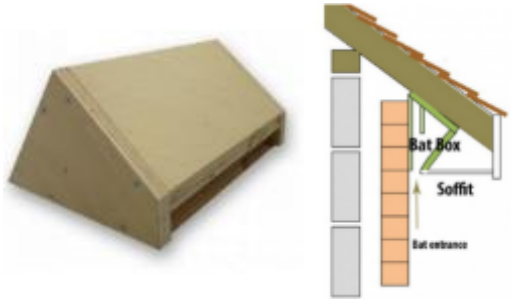
Ridge access



Where appropriated, ridge tile access should be made with the incorporation of traditional Bitumen 1F underfelt immediately beneath ridge tiles. Breathable BRM membrane can cause significant problems where bats are in contact with it, whereby their fine claws become entangled within the fibres of the membrane, entrapping and killing bats.

Soffit access

Where soffits are instated at gable elevations, roost provision may be instated in the form of a soffit bat box with internal roosting space.



Externally fitted boxes

A large number of externally fitted box models for bats exist for buildings and trees. Suitable models for both buildings and trees may include the Eco Kent Bat Box, with more examples present online.

Enhancing a development site for Breeding Birds

Nesting Birds - Common/Woodland/Garden

This traditional design has proved to be highly effective in attracting robins, as well as other small species such as black redstart, spotted flycatcher and wren. It is designed to be installed on the walls of houses, barns, garden sheds or other buildings and should be hung so that the entrance is to one side (at an angle of 90° to the wall). The front panel can be easily removed for cleaning.

This type of box should not be made conspicuous on a tree or bush because small predators can enter through the unprotected opening. By hanging on a wall, predators won't be able to reach the box. Alternatively hide the box in ivy, honeysuckle or other climbing plants.

See - www.nhbs.com/2h-schwegler-robin-box

Breeding Bids - House Sparrow

The Sparrow Terrace has been designed to help redress the balance of falling House Sparrow numbers. The current UK population is now half of what it previously was in 1980 and this is widely attributed to habitat destruction and lack of suitable nesting spaces. House Sparrows are social birds and like to nest in company, therefore, this terrace provides ideal nesting opportunities for three families. The terrace can be fixed on to the surface of a suitable wall or incorporated into the wall. It is suitable for all types of buildings.

Enhancing a development site for Invertebrates

Bee bricks

The Bee Brick can be used in place of a standard brick or block in construction to create habitat for solitary bees. Alternatively, it can be used as a standalone bee house in your garden or wild patch. It will provide much needed nesting space for solitary bee species such as red mason bees and leafcutter bees, both of which are non-aggressive.

Each Bee Brick contains cavities in which solitary bees can lay their eggs before sealing the entrance with mud and chewed-up vegetation. The offspring will emerge the following spring and the cycle will begin again. Each cavity goes part way into the brick, which is solid at the back. Bee Bricks should be placed in a warm sunny spot on a south-facing wall at a minimum height of 1m, with no vegetation obstructing the holes. It is highly recommended that bee-friendly plants should be located nearby so that the bees using the bricks have food, otherwise it is unlikely that the brick will be used.

Available in a choice of four colours: white grey, dark grey, yellow and red.

Specification
* Material: Concrete
* Origin: Cornwall, UK
* Dimensions: W 215mm x D 105mm x H 65mm
* Weight: 2.9kg
* Colours: White grey, yellow, dark grey and red

Deadwood and other semi-natural provisions

Falling and standing deadwood provides habitat opportunities for a wide range of invertebrates; however, poor execution of enhancement often leads to reduced efficacy. Log piles will generally dry out too quickly or rot too fast depending on their location; it is therefore more effective to place large logs in full sun to allow slow rotting which is favourable for beetles. Some smaller logs in full sun will provide additional habitat for bees and wasps, whilst loose bunds with bare earth also provide abundant opportunities for these and other taxa.

Large, piled logs in shade will rot slowly providing abundant opportunities for beetles

Bunds constructed of sand/earth are valuable to beetles, bees, wasps and other species

Enhancing a development site for Hedgehogs

Hedgehog Home

Specification:

Exterior quality 12mm resin bonded ply. The box remains untreated on the inside. Best situated in a quiet corner of the garden, and covered with leaves and other garden debris. Removable lid for cleaning purposes and reinforced corners, manufactured with surface sunk nails to resist rusting.

Nest box size: Height 22cm x Width 38cms x Length 47cm

Environmentally positive: Direct action to help hedgehog survival rates, encouraging biodiversity; FSC timber; Zero carbon footprint in use.

Hedgehog Highway

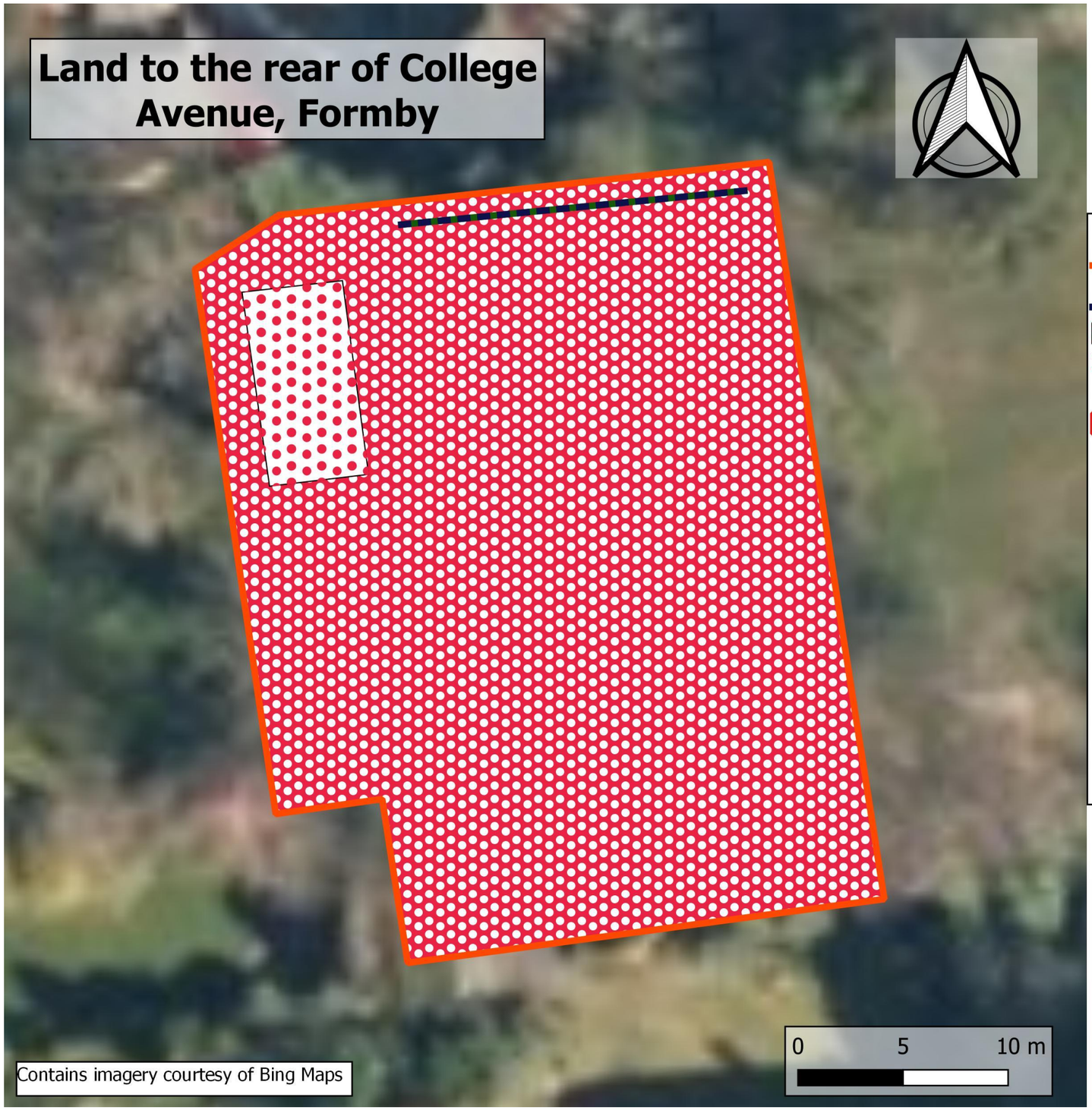
Hedgehog numbers have dramatically declined in recent years. Research suggests that this is partly because it is becoming harder for hedgehogs to move freely due to an increase in the number of solid walls and fences being erected around gardens. This reduces the available foraging area and so restricts the amount of food that they can eat as well as reducing the possibility of meeting a mate. Creating a hole in a garden wall or fence will allow local hedgehogs to pass through from garden to garden safely.

A hole measuring 13cm by 13cm is the right size for a hedgehog to pass through but too small for most pets. Once you have made your hole in the fence or wall, you can fix the Eco Hedgehog Hole Plate to the fence, ensuring that the hole does not get blocked or stretched. The plate has six screw holes, three along each side, which can be used to fix the plate to your fence or wall. Additional holes can be made in the plastic if required.

The Eco Hedgehog Hole Plate is made from 100% recycled plastic, which is mostly derived from plastic waste from farms across the UK. The plastic hedgehog hole is UV-stabilised so will not rot or degrade over time.

Specification: Material: Low density Polethylene board (100% recycled plastic)
* Dimensions: Height 26cm x width 23cm
* Entrance Hole: 13cm x 13cm
* Country of Manufacture: England

Appendix IV: UK Habitats Map



Tyrer Ecological Consultants Ltd
Specialists in Protected Species

UK Habitats Key

- u1e - built linear feature
- 69 - fence
- w1g6 - line of trees
- u1b5 - buildings
- u1c - artificial unvegetated unsealed surface
- 16 - tall herb
- 17 - ruderal / ephemeral
- Boundary

Survey Date: 03/10/2022
Drawn: Mr. H. Mulligan
Date Drawn: 03/10/2022
Checked & Approved: Mrs. K. Wilding
Size: A3
Scale: 250

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