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Preliminary Ecological Appraisal

August 2022

Land to the rear of Maes Muriog
Meliden
Prestatyn
Wales
LL19 8LW

National Grid Reference: SJ0584981061

Document Title	Preliminary Ecological Appraisal
Version No.	1.0
Prepared for	Kingscrown Properties Ltd
Prepared by	Tyrer Ecological Consultants Ltd

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Date of Issue	16/08/2022

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Executive Summary

As part of a proposed planning application at Land to the rear of Maes Muriog, Meliden; a Preliminary Ecological Appraisal (PEA) was undertaken by Tyrer Ecological Consultants Ltd during June 2022, in accordance with the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and other best practice guidance. It is understood that proposals for the site involve the clearance of the application site to allow for a new housing development – no further details are understood at this time.

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

Habitats: The Priority habitat Deciduous Woodland is located within the application site boundary. *Recommendations in relation to native species replanting have been provided in Section 8 of this report.*

Vegetation: Two species listed under Schedule 9 of the Wildlife and Countryside Act (as amended) (1981), namely Variegated Yellow Archangel (*Lamiastrum galeobdolon subsp. argentatum*) and Montbretia (*Crocosmia x crocosmiiflora*) was identified within the site boundary. *Recommendations for their removal and disposal are given within Section 8 of this report.*

Bats: There are no buildings present within the site boundary; however, the majority of trees on site could not be assessed in relation to roost potential for bats. *Before any works take place, access should be provided to the ecologist to undergo a thorough inspection of mature trees on site i.e., a further assessment should be undertaken during site clearance. Following the provision of access to the full site a thorough assessment of all trees would be undertaken and recommendations provided as required.*

Breeding Birds: The site contains habitats suitable for nesting birds associated with rural and garden habitats, namely within the trees and extensive scrub. *All vegetation clearance works 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.*

Water Vole: The application site is considered broadly unsuitable for Water Vole, but is located within an area marked as potential habitat for this species. *In the absence of mitigation the development has potential to damage/destroy burrows and has the potential to injure/kill Water Voles therefore further surveys for Water Vole are outlined in Section 8.*

Other Terrestrial Fauna: The site contains limited areas of habitat suitable for use by species including Hedgehog, Common Frog and Common Toad. *No further surveys are required in relation to these species; however, methods to reduce risks to these species have been provided throughout section 8.*

Biodiversity Benefit: A series of recommendations have been given within section 8.0 and Appendix III which provide opportunities for net biodiversity benefit 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

As part of a proposed planning application at Land to the rear of Maes Muriog, Meliden (see Figure 1.1); a Preliminary Ecological Appraisal (PEA) was undertaken by Tyrer Ecological Consultants Ltd during June 2022, in accordance with the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and other best practice guidance. It is understood that proposals for the site involve the clearance of the application site to allow for a new housing development – no further details are understood at this time.

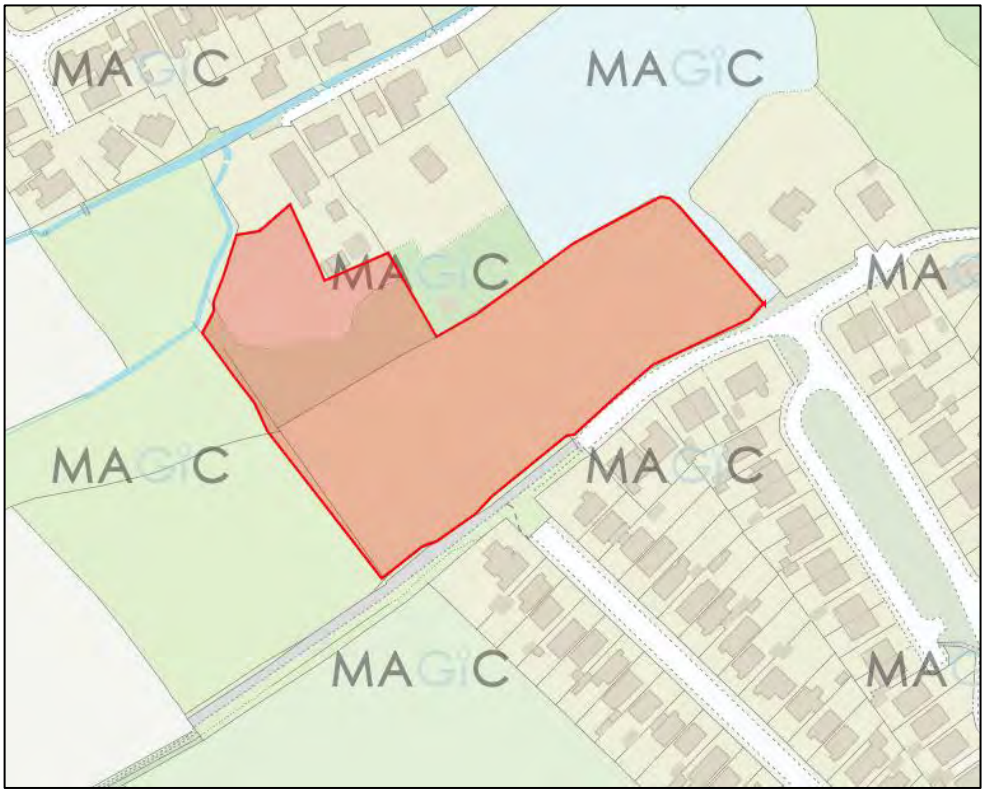

Figure 1.1: Existing site plan with red line development boundary (adapted ©*MAGiC Maps 2022*).

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 Kingscrown Properties Ltd.

Aims & Objectives

1.3 The survey aimed 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);

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, 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) 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 key legislature considered for the purposes of this report includes the following:

- The Environment (Wales) Act (2016),
- Conservation of Habitats and Species Regulations (amendment) (2019) (EU Exit),
- Countryside Rights of Way (CRoW) Act (2000),
- Natural Environment and Rural Communities (NERC) Act (2006),
- Protection of Badgers Act (1992),
- Town and Country Planning Act (1990),
- Wildlife and Countryside Act (1981) (as amended),

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) The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (SI 2019/579) Wildlife and Countryside Act (1981) (as amended) Environment (Wales) Act (2016)	All British bats and their roosts are afforded full protection from damage/destruction and bats may not be injured/killed/taken at any stage. Bats are also protected from reckless disturbance; 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) Environment (Wales) Act (2016)	All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected.
Great Crested Newt (GCN)	CRoW Act (2000) Conservation of Habitats and Species Regulations (2019) (EU Exit) Wildlife and Countryside Act (1981) (as amended) Environment (Wales) Act (2016)	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.

Policy

2.4 Planning Policy Wales (PPW) 11th Edition (2021) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. PPW, the TANs, MTANs and policy clarification letters comprise national planning policy.

2.5 PPW and the National Development Framework (published as Future Wales – the National Plan 2040) set out how the planning system at a national, regional and local level can assist in delivering these requirements through Strategic Development Plans (SDPs) and Local Development Plans (LDPs).

2.6 PPW (2021) states:

"The presence of a species protected under European or UK legislation, or under Section 7 of the Environment (Wales) Act 2016 is a material consideration when a planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat and to ensure that the range and population of the species is sustained. Planning authorities should advise anyone submitting a planning application that they must conform with any statutory species protection provisions affecting the site, and potentially the surrounding area, concerned. An ecological survey to confirm whether a protected species is present and an assessment of the likely impact of the development on a protected species may be required in order to inform the development management process. It is considered best practice that screening to determine the

presence of protected species should be carried out by a competent ecologist on the basis of data provided by the relevant Local Environmental Record Centre."

2.7 Planning authorities must therefore follow a step-wise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly avoided, or minimized, or mitigated, and as a last resort compensated for; enhancement must be secured wherever possible.

2.8 The first priority for planning authorities is therefore to avoid damage to biodiversity and ecosystem functioning. Where there may be harmful environmental effects, planning authorities will need to be satisfied that any reasonable alternative sites that would result in less harm, no harm or pro-gain have been fully considered.

2.9 The Environment (Wales) Act 2016 ("the Act") - requires local planning authorities to have regard to area statements in the development of Local Development Plans. The Act introduced an enhanced biodiversity and resilience of ecosystems duty (Section 6 Duty). This duty applies to public authorities in the exercise of their functions in relation to Wales and will help maximise contributions to achieving the well-being goals. The Nature Recovery Action Plan supports this legislative requirement to reverse the decline in biodiversity, address the underlying causes of biodiversity loss by putting nature at the heart of decision-making and increasing the resilience of ecosystems by taking specific action focused around objectives for habitats and species.

Part 1 of the Act promotes sustainable management of natural resources, and in Part 1 section 6 states:

"A public authority must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions."

2.10 This is further supported by PPW (2021) which requires developments to achieve a Net Benefit for Biodiversity (NBB):

"*Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a* ***net benefit for biodiversity****. In doing so planning authorities must also take account of and promote the resilience of ecosystems, in particular the follow aspects:*

- *diversity between and within ecosystems;*
- *the connections between and within ecosystems;*
- *the scale of ecosystems;*
- *the condition of ecosystems including their structure and functioning; and*
- *the adaptability of ecosystems.*"

2.11 There are several plans, strategies and national, sub-regional and local policy statements which provide a framework for development in the Plan area. The Planning and Compulsory Purchase Act (2004) makes it a requirement for local planning authorities in Wales to prepare a Local Development Plan (LDP) for their areas.

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 Section 7 of the Environment Act (Wales) places a duty on Welsh Ministers to publish, review and revise lists of types of habitats and species in Wales which they consider are of key significance to sustain and improve biodiversity. The Welsh Ministers must also take all reasonable steps to maintain and enhance the habitats published in these lists, and encourage others to take such steps. Section 7 of 'The Act' alongside 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 Deciduous Woodland,
- Bats that include Noctule (*Nyctalus noctula*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*),
- Common toad (*Bufo bufo*) and Great Crested Newt (GCN) (*Triturus cristatus*), Water Vole (*Arvicola amphibius*), Badger (*Meles meles*).
- Bird species that include House Sparrow (*Passer domesticus*), Dunnock (*Prunella modularis*) and Song Thrush (*Turdus philomelus*),
- Flora that includes Cornflower (*Centaurea cyanus*).

District context

3.4 Local Biodiversity Action Plans (LBAPs) 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.

LBAPs 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 Denbighshire LBAP includes all the Section 42 species and habitats occurring within the Denbighshire Planning Authority area plus any others of local significance.

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 Before 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 'DataMapWales' and 'The Lle Geo-Portal' were accessed to gather such information; this interactive mapping service was also used to locate any European Protected Species Mitigation Licenses (EPSML), Habitat 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 (© 2021-2022) 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 the 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 and low-impact nature of the proposed development, 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 24th June 2022 in dry conditions (17ºC), wind 2/12 (Beaufort scale), and 70% cloud by the following surveyor (Table 4.1).

Table 4.1 - Surveyor credentials

Name	Description of relevant credentials
Miss. K. Judson MSc (Junior Ecologist)	Three years of professional consultant experience & training; accredited agent on the (Class 2) Natural England bat licence Mrs. K. Wilding (CLS-14227); BSc (Hons) Biology; MSc Conservation Management; 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 rollout 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 Additional to attributing ecological value to red-listed / BAP species, under existing CIEEM guidance, a geographic frame of reference is also adopted. Plant species and habitats may be recognised for their ecological notoriety on a geographical scale which is adopted on a site-to-site basis (see Figure 4.1 below).
For a site-relevant species list, see Appendix II.

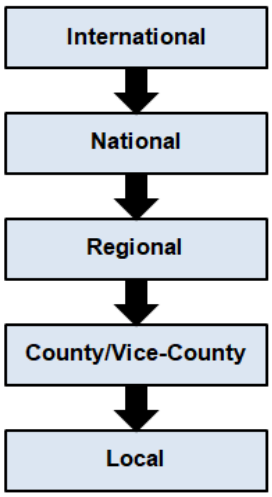

Figure 4.1 - Geographic Frame of Reference entailing degrees of conservation importance

4.10 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

4.11 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

4.12 The site would be assessed for bats, and 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.

4.13 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 over 50mm or bat/bird boxes. All accessible trees were inspected for their potential to host roosting bats.

4.14 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*

4.15 Factors considered during the preliminary roost assessment include:

- Knowledge of bat species relevant to the site location and geographical range,
- Nature of the immediate habitat concerning foraging opportunities/surroundings,
- 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

4.16 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 specially 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

4.17 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 the use of the site by European Hedgehogs (*Erinaceus europaeus*), Brown Hare (*Lepus europaeus*) and Water Vole (*Arvicola amphibius*), or habitats of value to them, were also recorded.

4.18 A survey was carried out along the area of a ditch/stream located 65m north (downstream) of the application site (see Figure 4.2). During the search from the bankside, the banks were investigated for evidence of Water Vole. Water vole field signs typically involve the following:

- ***Sightings*** – confirmed sighting of a Water vole during the survey.
- ***Latrines*** – collections of droppings.
- ***Burrows*** – holes along the water's edge and in the bank above.
- ***Footprints*** – forefoot and hind foot.
- ***Pathways in vegetation*** – low runs or tunnels pushed through vegetation.
- ***Feeding remains*** – piles of chewed lengths of vegetation with 45 degree cuts to the ends.
- ***Cropped grass around tunnel entrances*** – grazed vegetation to form a 'lawn' around burrow.

4.19 Whilst conducting the search for water vole evidence, the same areas were searched and appraised relative to otter. During the survey, banks and aby exposed areas were investigated for signs of use, such as otter spraint (droppings), shelter used by otters such as underground holts and above ground couches, feeding remains and otter tracks.

Figure 4.2 – Location of areas of the identified water body surveyed (blue) for Water Vole and Otter, relative to the site (red) (adapted © Google Earth 2022).

4.20 The Water vole survey methodology followed recommendations contained within the *Water Vole Conservation Handbook, 3rd Edition* (Strachan & Moorhouse 2011). Furthermore, the Mammal Society *Water Vole Mitigation Handbook* (2016) was also referred too, notably the Flow Chart (See Figure 4.3).

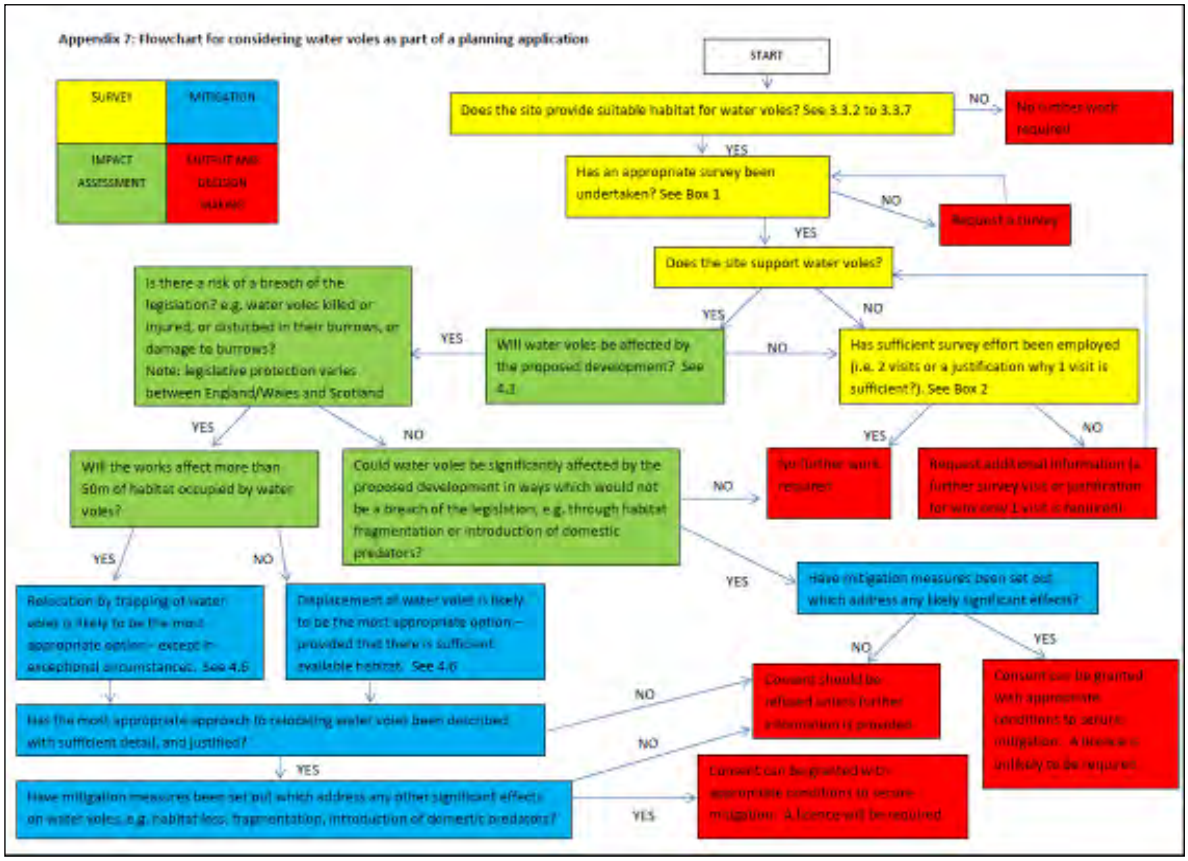

Figure 4.3 – Water vole survey methodology extract (Mammal Society, 2016).

GCN

4.21 During a desktop assessment a 500m search was undertaken from a site-central grid reference concerning 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) state 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.*

4.22 Based on the small scale of the proposed development and using best practice guidance, a 500m buffer was used. No ponds are present within the site boundary, one pond is present approximately 450m northwest of the application site.

4.23 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 the 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

4.24 The application site was assessed for the presence of features that should be considered of high value to invertebrates. Several 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

4.25 The results, conclusions and recommendations of this report are based on several 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 concerning shelter, foraging and commuting opportunities.

4.26 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 Miss. K. Judson.

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 the botanical identification skills of the surveyor. Many plant species are only evident at certain times of the year; consequently, 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 The survey was conducted at a time when bats are within their active season when evidence of bats can be most apparent; thus, survey timing is not considered a constraint in this instance.

5.4 Significant access constraints were experienced in that much of the application site could not be accessed owing to the high density of scrub and other vegetation present throughout the application site, as such, the survey was performed via accessing as much as the site as possible and assessing the site from accessible regions of the site where possible. Such a constraint may mean signs of protected species within the application site and any invasive species may have been missed. No other access limitations were experienced on site; whilst significant access limitations were encountered owing to the nature of the site, an assessment of suitability for protected species could be made where evidence may have been missed hence taking everything into consideration the access constraints would only minorly affect the results, conclusions, and recommendations in this report.

6.0 Desk Study Results

6.1 The plot to the rear of Maes Muriog ("the application site", circa 1.26 hectares) is situated within Meliden, located approximately 2.10km southwest of the centre of Prestatyn (see Figure 6.1).

Figure 6.1 - Location of application site (red boundary) within the surrounding landscape (Source: Google 2018)

6.2 The application site can be described as a large area of bramble scrub with scattered trees and lines of trees at the north of the site; additionally, an area of grassland is present at the northwest of the application site.

6.3 The wider habitat comprises a combination of residential and commercial premises and agricultural land interlinked by numerous minor roads. Features of ecological interest present in the extending environment include areas of Ancient Semi-Natural Woodland located approximately 900m east of the application site, 1.0km south and 1.60km southeast of the application site; also present are areas of restored Ancient Woodland located 1.45km south of the site and 1.90km northeast of the application site.

6.4 The site has fair connectivity the aforementioned ecological features with only minor roads and small-scale residential housing estates separating the application site from the southern and eastern habitats; there are no obstacles to connectivity that would prevent free movement for flying fauna.

6.5 The described ecological frameworks are considered to offer a reasonable array of habitats with reasonable inter-connectivity in the landscape, which is of benefit to some 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.

6.6 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, whilst the agricultural grasslands to the south offer some foraging potential for Barn Owl (*Tyto alba*).

6.7 Four statutorily designated site feature within 2.0 kilometres (see Table 6.1, Figure 6.2).

Table 6.1 - Designated sites in proximity to the survey area

Site name	Designation type	Interest features
Graig Fawr	Site of Special Scientific Interest (SSSI) (430m south)	Graig Fawr is designated for its range of calcareous grassland communities which give rise do a diverse assemblage of vascular plants and hence lepidoptera. Whilst areas of carboniferous limestone are present throughout the site, areas of thin and drought prone soil possess an assemblage of grasses more typical of acid grasslands.
Prestatyn Hillside	SSSI (750m east)	The site possesses a variety of important and interesting habitats including calcareous grassland, calcareous heath and broad-leaved woodland which give ruse to a range of flowering plants including Bird's-nest Orchid (*Neottia nidus-avid)* and Greater Butterfly Orchid (*Platanthera chlorantha*).
Maes Hiraddug	SSSI (1.47km south)	The site is designated for its unimproved neutral grassland vegetation which occurs in association with small patched of woodland and scrub. Uncommon species that have been recorded on this site include Pepper-Saxifrage (*Silaum silaus),* Spiny Restharrow (*Ononis spinosa*) and Bee Orchid (*Ophrys apifera*).
Teilia Quarry	SSSI (1.96km east)	Teilia Quarry is the only known locality of the distinctive Upper Black Limestone flora and has yielded numerous recognisable pteridiosperms fossils. It is also notable for its botanical assemblage.

Desktop study - Species records

6.8 **Bats:** No roost or activity records were found within the extensive Tyrer Ecological Consultants Ltd database, this data is from 2014-present and has been submitted to the relevant LERC for the area.

6.9 **Great Crested Newt:** No GCN records were identified within 2.0km of the site boundary. A search of the DataMapWales potential habitat for GCN revealed an absence of such habitat within 1.0km of the application site.

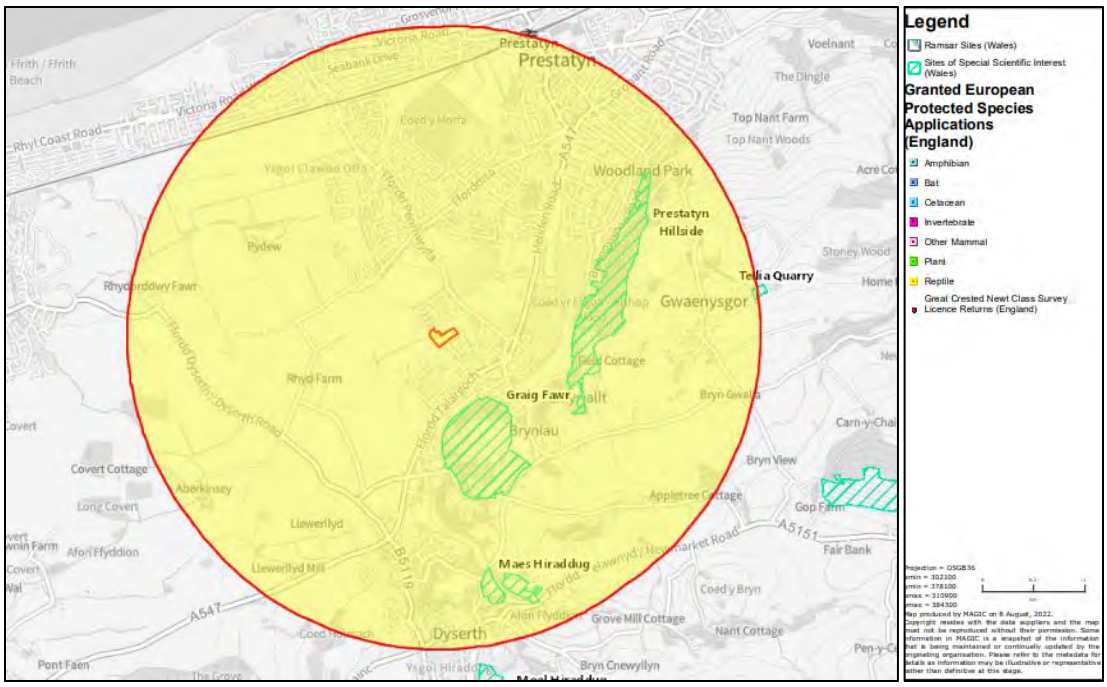

Figure 6.2 – Location of designated sites relative to the application site (Source: adapted from MAGIC Maps, 2022)

6.10 **Water Vole:** A search of the DataMapWales potential habitat for Water Vole revealed suitable habitat for water vole approximately 65m north (downstream) of the application site (see Figure 6.3 below).

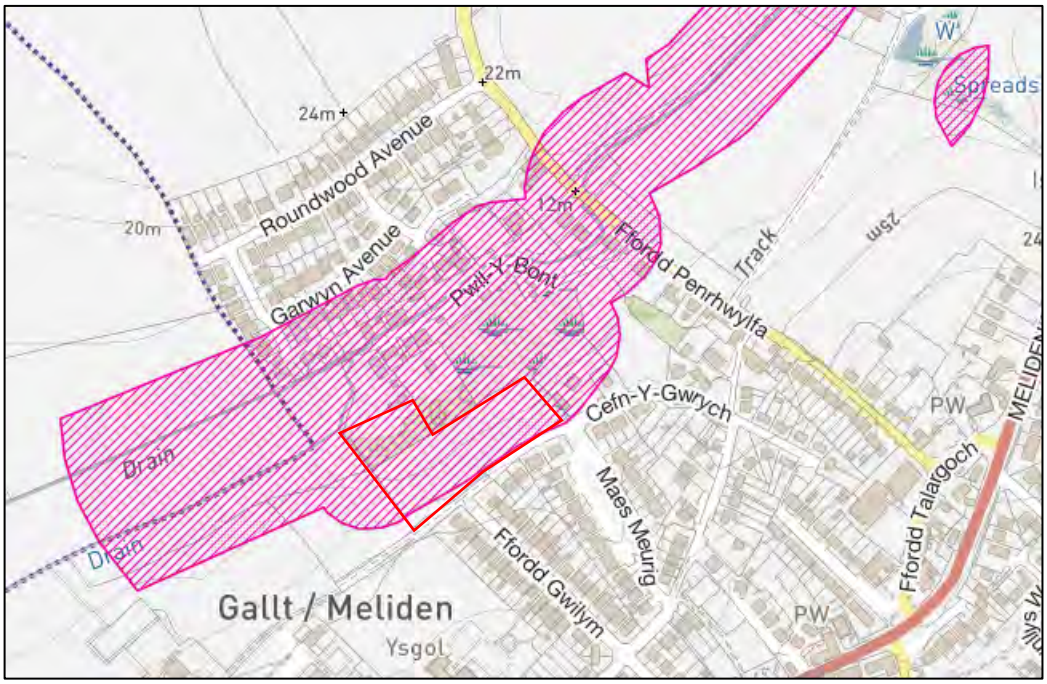

Figure 6.3 – Habitat (shaded purple) assessed as potential suitable for water vole, location of the application site is illustrated by the red line boundary (adapted from © DataMapWales, 2022).

7.0 Field Survey Results

7.1 Habitat Survey

7.1.1 See Table 7.1.1 (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 7.1.1 - UK Habitats recorded within the survey area with target notes

Habitat		Description
Dense Scrub – **h3**		The majority of the application site is characterised by dense scrub; species present within this area comprise Bramble (*Rubus fruticosus* agg.), Common Hogweed (*Heracleum sphondylium*), Common Nettle (*Urtica dioica*), Hedge Woundwort (*Stachys sylvatica*), Hedge Bindweed (*Calystegia sepium*), Petty Spurge (*Euphorbia peplus*), Great Horsetail (*Equisetum telmateia*) and Common Ivy (*Hedera helix*).
		Secondary Habitat Code(s): 11 scattered trees, 78 abandoned
Woodland – **w1f**		The north of the application site comprise a mixture of scrub with mature trees – species present in this area include Sycamore (*Acer pseudoplatanus*), Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), Holly (*Ilex aquifolium),* Osier (*Salix viminalis*), Crack Willow (*Salix fragilis*) and Bramble (*Rubus fruticosus*). Herbaceous species present include Hedge Bindweed (*Calystegia sepium*), Cleavers (*Gallium aparine*) and Common Nettle (*Urtica dioica*).
Other neutral grassland – **g3c**		The far north of the application site features an area of mown grassland encompassing a residential dwelling. Species present in this area include Perennial Rye Grass (*Lolium perenne*), Cock's-foot (*Dactylis glomerata*), Common Daisy (*Bellis perennis*), White Clover (*Trifolium repens*), Ribwort Plantain (*Plantago lanceolata*) and Creeping Buttercup (*Ranunculus repens*).
		Secondary Habitat Code(s): 64 mown
Line of Trees - **w1g5**		At the south of the application site and potential at other borders of the site that could not be accessed is a line of mature trees that grade into the scrub which characterises the majority of the application site. Species present include Sycamore (*Acer pseudoplatanus*), Hawthorn (Crataegus monogyna), Alder (*Alnus glutinosa*), English Oak (*Quercus robur*), Sessile Oak (*Quercus petraea*) and Elder (*Sambucus nigra*). The ground flora of this area includes Common Mallow (*Malva sylvestris*), Common Nettle (*Urtica dioica*), Hedge Bindweed (*Calystegia sepium*), Common Ragwort (*Jacobaea vulgaris*), Herb Robert (*Geranium robertianum*), Hedge Woundwort (*Stachys sylvatica*), Purple Toadflax (*Linaria purpurea*), Common Hogweed (*Heracleum sphondylium*) and Creeping Thistle (Cirsium arvense) amongst others. Evidence of local residence disposing of garden waste along this area is present as are two invasive non-native species (see Target Notes below).
Target Notes	**1**	Location of Variegated Yellow Archangel (*Lamiastrum galeobdolon subsp. argentatum*)
	2	Location of Montbretia (*Crocosmia x crocosmiiflora*)

7.1.2 Priority mixed deciduous woodland was identified within the application site boundary.

7.2 Vegetation

7.2.1 No species of conservation importance were identified within the site boundary. Two species listed as invasive under Schedule 9 of the WCA was recorded on the application site in the form of Variegated Yellow Archangel (*Lamiastrum galeobdolon subs. argentatum*) and Montbretia (*Crocosmia x crocosmiiflora*) (see Figure 7.2.1).

Figure 7.2.1 – Location of Variegated Yellow Archangel (Yellow) and Montbretia (Orange) within the application site boundary (Source: adapted from Google Earth)

7.3 Bats

7.3.1 No buildings are present on the application site.

7.3.6 An assessment of all trees that could be accessed from ground level found them to be absent of any rot holes, cracks, woodpecker holes, peeling bark, splits or other crevices typically used by bats; and have been duly categorised as pertaining to 'Negligible' bat roost suitability. Notwithstanding, trees present at the north of the application site and within the site could not be accessed due to the impenetrable nature of scrub and hence their suitability for bats could not be ascertained.

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 utilise the wider area with hunting habitat provided in the open grassland and arable fields, no evidence of or suitability for nesting was identified at the site; however, many trees present at the north of the application site could not be accessed and hence their suitability to support Barn Owl could not be assessed.

7.4.2 Abundant nesting platform opportunities for breeding birds are present at all taller vegetation including scrub and trees within the site boundary, and alarm calls and other territorial behaviour associated with breeding was displayed; the presence of nesting birds during the breeding season is thus highly likely. In addition, the following bird species were encountered during the survey (see Table 7.4.1 below):

Species	Binomial Name	Protection(s)
Wood Pigeon	*Columba palumbus*	Amber
Chiffchaff	*Phylloscopus collybita*	Green
Blackbird	*Turdus merula*	Green
Great Tit	*Parus major*	Green
Herring Gull	*Larus argentatus*	Red
Carrion Crow	*Corvus corone*	Green
S.41 a bird listed on section 41 of the Natural Environmental Communities Act 100 (NERC Act) BoCC 4 – a bird of conservation concern, Red being of the highest conservation priority.		

7.5 Other Terrestrial Mammals

Mammals

7.5.1 Field signs were located to indicate the presence of mammals, including pathways, hairs, footprints or feeding signs such as snuffle holes and scratched trees/logs; the application site and surrounding habitat possesses suitable habitat for a number of mammal species including rabbit and badger, their presence on the application site is considered likely.

European Hedgehog

7.5.2 In relation to European Hedgehog, the grassland present offers foraging and commuting habitat in its current state, whilst the areas of scrub with a denser understory may be utilised for refuge and hibernation; the presence of this species within the application site at any time of year is thus possible.

Other Terrestrial Mammals

7.5.3 An initial habitat suitability assessment of a ditch/stream present approximately 65m north of the application site (downstream) revealed the habitat to be of favourable quality to Water Vole in its current condition – see Table 7.5.1. A section of approximately 100m of the ditch/stream was assessed.

7.5.4 Ditch/Stream profile: The width of the ditch/stream is approximately 1.0-1.5m consistently up and down the ditch/stream; the water has a slow flow in an eastern direction and the region surveyed is of the maximum depth of 0.25m – though this depth could increase during wetter months. The water quality appears favourable with no obvious pollutants, discolouring or foul odours noted.

Table 7.3 - Water Vole habitat suitability assessment

Water Vole Habitat Suitability Assessment (Insert a 1 if feature is present)	
0< = Unsuitable Habitat / **>10** = Optimal Habitat	
Well developed (>60%) bankside and aquatic vegetation providing food & cover	**0**
A good variety of food plants, including favoured plants, and winter food sources	**1**
Suitable refuge areas above extremes in water levels	**1**
Soft, earth banks suitable for burrowing (30 to 60 degree slope)	**1**
Water permanently present (levels stable and does not dry up)	**1**
Open water provision for swimming	**1**
Ledge or berm present at or close to water level	**0**

Lack of damage or erosion to the banks	**1**
Slow flowing current or static water	**1**
Invasive Species absent (e.g. - Himalayan Balsam/Japanese Knotweed)	**1**

Habitat Assessment Score Total	**9/10**

7.5.5 Noise and visual disturbance are, in most cases, unlikely to have a significant effect on Water voles, however it should be noted that disturbance of Water voles occupying a place of shelter or protection is an offence under the WCA 1981 (as amended) operations with the potential to disturb a vole to the point it abandons its burrow is therefore a significant effect that requires mitigating against or/and mitigation licensing.

7.5.6 Potential evidence of protected terrestrial mammals i.e. Water Vole was identified along the ditch/stream in the form of burrows on the bank and on the grassy edges of the water body. Whilst such burrows could be attributed to rats, they could equally be attributed to Water Vole. No latrines, feeding remains or footprints were identified to confirm the presence of Water Vole. Anecdotal evidence suggests Water Voles have been present in this area; additionally, as previously mentioned within this report the site and ditch/stream does wall within an area listed a potential suitable habitat for Water Vole. No evidence of Otter was observed.

7.6 Herptiles

Great Crested Newt (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 identified records of GCN within 2.0km to the site,
- No habitat suitable for GCN as per the DataMapWales map within 1.0km,
- No ponds on site or within 250m; one pond located within 500m of the application site.

7.6.3 The habitat present within the site boundary is considered somewhat for GCN, with the scrub and woodland providing cover from exposure or predation; however, given the distance of the nearest pond to the application site and the unsuitable nature of the open agricultural land separating the pond from the application site and taking into account the absence of any evidence of GCN in the wider area, the presence of this species at the application site is highly unlikely and GCN are not a material consideration for this proposed development. Nonetheless, a further risk assessment of the risk of impacts upon GCN was undertaken. The main hypothetical impacts to consider include potential for terrestrial habitat loss (up to 1.26 ha within 250-500m of a potential breeding pond. The results of the Rapid Risk Assessment below, as extracted from the Natural England 'Template for Method Statement' (Table 7.6.1 and Table 7.6.2).

Table 7.6.1 – Rapid Risk Assessment in relation to loss of habitat

Component	**Likely effect** (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	1 - 5 ha lost or damaged	0.04
Individual great crested newts	No effect	0
	Maximum:	0.04
Rapid risk assessment result:	**GREEN: OFFENCE HIGHLY UNLIKELY**	

Table 7.6.2 – Rapid Risk Assessment in relation to individual newts

Component	**Likely effect** (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	No effect	0
Individual great crested newts	Killing or injuring newts	0.8
	Maximum:	0.8
Rapid risk assessment result:	**RED: OFFENCE HIGHLY LIKELY**	

7.6.4 Based on the above risk assessments, the potential to cause injury or mortality to individual GCN is the key consideration regarding this species, with loss of any terrestrial habitat unlikely to cause any significant impact. Recommendations have been provided within section 8.0.

N.B. *The risk assessment tool is a general guide only, and as such is simplistic and is not intended to replace a site-specific risk assessment informed by a field survey. A number of factors are not included for simplicities sake: population size, terrestrial habitat quality, presence of dispersal barriers, timing and duration of works, detailed layout of development in relation to new resting and dispersal, and a number of factors could also increase or decreased the risk of offence.*

Other Herptiles

7.6.4 Given the habitat occurring within the boundary as described, it is possible that more common robust amphibians such as Common Frog (*Rana temporaria*) and Common Toad (*Bufo bufo*) will utilise the site occasionally for commuting and foraging.

7.6.6 In respect to reptiles, the site is absent of habitat mosaics typically favoured this taxon, with all habitats with discrete boundaries and limited opportunities for basking, foraging and shelter.

7.7 Invertebrates

7.7.1 An assessment of habitats and features on site found an extremely limited array of ecotones present at the intersection of scrub, grassland, and hardstanding, 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 also unlikely to be present.

8.0 Conclusions & Recommendations

Habitats & Vegetation

8.1 No botanical species of conservation interest WCA were identified within the accessible areas of the application site. One habitat of conservation importance was identified across the majority of the application site in the form of the UKBAP habitat 'mixed deciduous woodland'.

8.2 At present the exact details of the proposals are not known however it is understood that proposals entail significant site clearance which would result in the loss of areas of woodland. It is therefore recommended to compensate for the loss of woodland trees that the planting of UK native trees such as Pedunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*) or other native tree species such as those listed in the "Native Planting and/or Landscaping" table in Appendix III be planted at a ratio of 2:1 to compensate and enhance the woodland following the loss of individual trees proposed to be felled.

8.3 Two species listed as invasive under Schedule 9 of the WCA was identified in the form of Variegated Yellow Archangel and Montbretia. Whilst it is not an offence for this species to be present on a site, it is an offence to spread or allow it to spread; to prevent incidental spread of this species during the proposed works it is recommended that control methods are taken as described below.

Control Methods

8.4 Montbretia spreads by rhizome, only rarely by seed. Whilst Variegated Yellow Archangel spreads by seed and by long runners. It is recommended that Montbretia and Variegate Yellow Archangel are eradicated from site prior to any development - they can be treated by mechanical means or by chemical control. Following eradication, a grass and forb mix should be used to prevent colonisation of any newly exposed bare areas. Treatment tips are provided below; a licenced invasive species contractor may be required to carry out the works.

Control Methods:

Mechanical Control:

- Plants can be dug out, but it is essential that all the plant material and corms (bulbs) of Montbretia are removed. If corms are broken up or accidentally left, they can produce new plants potentially making the problem worse.,
- Excavated material should be treated as controlled waste and removed from site to a licensed landfill or dealt with on site in waste management areas or buried.

Chemical Control:

- Infestations can be effectively treated with herbicide whilst the plants are actively growing.

8.5 To provide an opportunity for Biodiversity Net Gain and 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).

8.6 To provide an opportunity for NBB and 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

8.7 There are no buildings present within the site boundary; however, the majority of trees on site could not be assessed in relation to roost potential for bats due to the impenetrable nature of the site. Therefore, before any works take place, access should be provided to the ecologist to undergo a thorough inspection of mature trees on site. Following the provision of access to the full site a thorough assessment of all trees would be undertaken and recommendations provided as required.

8.8 Regardless of roosting potential, all taller trees and boundary features provide valuable commuting and foraging habitat for bats. 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.

Appropriate luminaire specifications
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

8.9 No impacts are applicable in relation to specially protected bird species such as Barn owl, and no further recommendations need be applied in relation to WCA Schedule 1 protected species.

8.10 Evidence of nesting birds was identified within the application site in the form of several species of birds observed utilising the scrub and demonstrating alarm calling and territorial behaviour during the site visit. The site offers multiple nesting platform opportunities in the form of scrub, dense vegetation and trees, and is therefore considered to be confirmed bird breeding site.

8.11 To avoid disturbing nesting birds, it is recommended that any clearance works should be undertaken outside of the breeding birds' season of March-August due to the density of the scrub on site. Alternatively, due to the density of the scrub, breeding bird surveys could be undertaken by a suitably qualified ecologist to identify specific locations being utilised by breeding birds within 48 hours prior to clearing works commencing. Areas identified would be clearly demarcated by the ecologist and left until the end of the breeding birds' season or until such a time as the nest has been abandoned naturally.

8.12 Point 3.24 of the British Standards Publication 42020:2013 defines a professional ecologist as "*a person who has, through relevant education, training or experience, gained recognised qualifications and expertise in the field of ecology and environmental management.*"

NB: *All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected from destruction, damage and disturbance under the Wildlife & Countryside Act 1981* (*as amended*)*. It is a punishable offence to interfere in any way with an active nest.*

8.13 Once the breeding birds' season is complete or alternatively on the completion of suitable breeding birds' surveys, access to the site should be provided by clearing a path though the scrub to allow for a PRA of the mature trees on site and to fully assess the site for any other key ecological constraints; an updated PEA would then be provided detailing any necessary further survey work or recommendations. It is recommended that a working Method Statement detailing Reasonable Avoidance Measures (RAMs) to include a pre-commencement check should be drawn up by a suitably experienced ecologist as a precaution for nesting birds and other species such as Hedgehogs, which would be strictly adhered to during the clearance of the path.

Terrestrial Mammals

Mammals

8.14 Field signs were located to suggest the presence of mammals thus confirming their presence.

8.15 In relation to Hedgehog, habitats present offer suitability for discrete foraging, territory marking, rest, shelter and hibernation, Hedgehogs and the presence of this species in the site boundary is possible. It is therefore recommended that if Hedgehogs are encountered during working operations, particularly if there is a risk of danger to the animals, they should be carefully placed in like-for-like habitat away from the working area. Low-angled, sloping boards of approximately 300mm width should be placed within any excavations at the end of each working day to facilitate a means of escape for small mammals. In addition, enhancement for Hedgehog as per Appendix III should be included in landscaping proposals for the site.

Water Vole

8.16 Suitability for Water Vole was identified to the north of the application site, such habitat has potential to be impacted post-development in the form of increased groundwater run off from the application site due to the proposed creation of housing and hardstanding habitats. Such ground water run-off has the potential to alter the habitat suitable for Water Vole with a risk of making the habitat un-suitable.

8.17 Owing to the high suitability of the ditch/stream and potential post-development impacts, surveys for Water Vole should be undertaken. Ideally one survey should be undertaken in the first half of the season (between mid-April/early May and the end of June) and one in the second half of the season (between July and September); the visits should ideally be undertaken at least two months apart, circumstances in which only a single visit is likely to be necessary are set out in Box 2 (See Figure 8.2, extracted from the Water Vole Mitigation Handbook 2016).

Box 2: Field sign surveys – one site visit or two?

The water vole is a mobile species that responds to habitat changes over the course of the breeding season: a single visit can therefore be insufficient to confirm likely absence in many cases. In addition, where water voles are present, survey data based on two visits will allow a more robust assessment of the impacts of the project, particularly where water voles use different parts of a site during different parts of the breeding season. This can also be important in determining the most appropriate approach to mitigation. These guidelines therefore recommend that two field survey visits are routinely undertaken. However, it is recognised that the second visit may not be required in some cases, and it may therefore be possible to make a case for an assessment based on one visit. Examples of scenarios where a single visit (before submitting a planning application) may be sufficient are as follows:

i) *Water vole presence is confirmed during the first survey visit*

A second visit may not be needed where the assessment of effects on water voles can be made on a precautionary basis (i.e. water voles are present throughout the site at the maximum density that the habitat could support), **and** the approach to mitigating incidental mortality (displacement, relocation by trapping, off-site translocation, etc.) can be determined from the first visit alone.

The assessment of the quality of the habitat, and therefore the likely maximum density of water voles, will need to consider changes to the habitat in different parts of the breeding season as a result of natural processes (e.g. changes to water level) and management activities. This can be a difficult assessment to make for many sites.

8.18 In the absence of mitigation development of the site has potential to cause Water Vole to abandon their burrows through disturbance, has the potential to damage/destroy burrows and has the potential to injure/kill Water voles and thus would be at risk of causing an offence under current legislation; Water vole burrows can extend up to 5.0 metres into the bank, and this species is susceptible to vibration/noise and reckless destruction.

8.19 The relevant Water vole legislation implications at the application site under Section 9 of the Wildlife and Countryside Act 1981(as amended) (W&CA) state it is illegal to:-

- *Intentionally or recklessly damage or destroy, any structure or place which any wild water vole uses for shelter or protection. 9(4)(a)*
- *Intentionally or recklessly disturb any such animal while it is occupying a structure or place which it uses for that purpose. 9(4)(b)*
- *Intentionally or recklessly obstruct access to any structure or place which any wild water vole uses for shelter or protection. 9(4)(c)*

8.20 The outcome of these surveys will be used to confirm presence/absence of the species and therefore be utilised to inform a Reasonable Avoidance Measures (RAM's) for the site. These will be drawn up by a drafted up by a suitably qualified ecologist/ecological clerk of works (EcOW) and should provide a detailed audit trail that includes significant dates, outlines sufficient timing schedule, and provides a signing in sheet for contractors who should comply with a toolbox talk.

Herptiles

8.21 Taking into account the absence of connectivity between the application site and nearby pond networks, and the unfavourable nature of the habitats separating the application site from the nearest potential breeding pond, the presence of Great Crested Newt is highly unlikely and there are no further recommendations in relation to this species.

8.18 There is a reasonable likelihood of Common Frog and Common Toad being present on site. Due to general declines in most British amphibian species in recent years, many local authorities require amphibian surveys as a planning condition, or as part of environmental information submitted as part of a planning application, even where the presence of EPS is ruled out.

8.19 If in the event any amphibians are encountered during any stage of site operations, and they are at risk of harm, site personnel are advised that using wet gloves they should be removed from harm by being carefully handled and removed off the construction site to be placed in nearby like-for-like habitat.

The applicant and all contractors should be aware that in the extremely unlikely event that if at any stage GCN are encountered during works, or at any other stage of the work programme, works would be required to immediately cease and an Ecologist made aware as to provide further guidance in this situation. In the event that GCN or their habitat would be directly impacted upon, including disturbance, an EPSML to legally proceed with the development may be required following detailed further presence/absence surveys.

8.20 The site is unlikely to host a population of any reptile species and there are no further recommendations in relation to these taxa.

Invertebrates

8.21 Enhancement measures for invertebrates will be provided within Appendix III which may help the proposed development to achieve its biodiversity net benefit aims.

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Appendix I: Site Photographs

Plate 1: Overview of the application site as viewed from the south.

Plate 2: Further character of the application site as viewed from the south.

Plate 3: Piled materials that could act as hibernacula/refugia

Plate 4: Montbretia identified at the southern boundary of the application site.

Plate 5: Character of the dense scrub throughout the application site.

Plate 6: Character of the north of the site

Plate 7: Priority hedgerow at the southern border of the application site.

Plate 8: Presence of horsetails at the southeast of the application site.

Plate 9: Character of the application site as viewed from within, at the southeast of the site.

Plate 10: Character of the grassland located at the northwest of the application site.

Plate 11: Character of the pond located within 500m of the application 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	Notes
Anthophyta (Flowering plants)	Annual Meadow Grass	*Poa annua*		
	Bramble	*Rubus fruticosus agg.*	D	
	Cleavers	*Gallium aparine*	D	
	Common Daisy	*Ilex aquifolium*	R	
	Common Ivy	*Hedera helix*	A	
	Common Nettles	*Urtica dioica*	A	
	Common Ragwort	*Senecio jacobaea*	O	
	Elder	*Sambucus nigra*	O	
	Great Horsetail	*Equisetum telmateia*	LA	
	Hawthorn	*Crataegus monogyna*	F	
	Hedge Woundwort	*Stachys sylvatica*	O	
	Hedge bindweed	*Calystegia sepium*	F	
	Common Hogweed	*Heracleum sphondylium*	O	
	Holly	*Ilex aquifolium*	F	
	Lords and Ladies	*Arum maculatum*	O	
	Mallow	*Malva sylvestris*	O	
	Montbretia	*Crocosmia x crocosmiiflora*	O	INNS
	Pedunculate Oak	*Quercus robur*	O	
	Perennial Rye Grass	*Lolium perenne*	O	
	Periwinkle	*Vinca minor*	R	
	Petty Spurge	*Euphorbia peplus*	R	
	Privet	*Ligustrum vulgare*	R	
	Purple Toadflax	*Linaria purpurea*	R	
	Ribwort Plantain	*Plantago lanceolata*	O	
	Sessile Oak	*Quercus petraea*	R	
	Sycamore	*Acer pseudoplatanus mn*	F	

	Variegated Yellow Archangel	*Lamiastrum galeobdolon subsp. argentatum*	O	INNS

Appendix III: Biodiversity Enhancement

Native Planting and/or Landscaping - recommended species

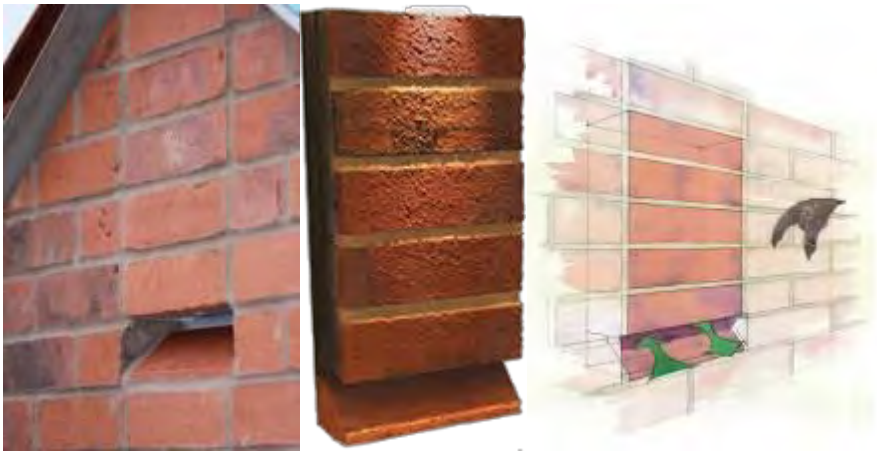
The below species have been assessed against the local soil and habitat types and are deemed suitable for the site.
All plant material should comply with the minimum requirements in BS 3936-1: 1992 Specification for trees and shrubs and BS 3936-4: 2007 Specification for forest trees and BS 8545: 2014 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

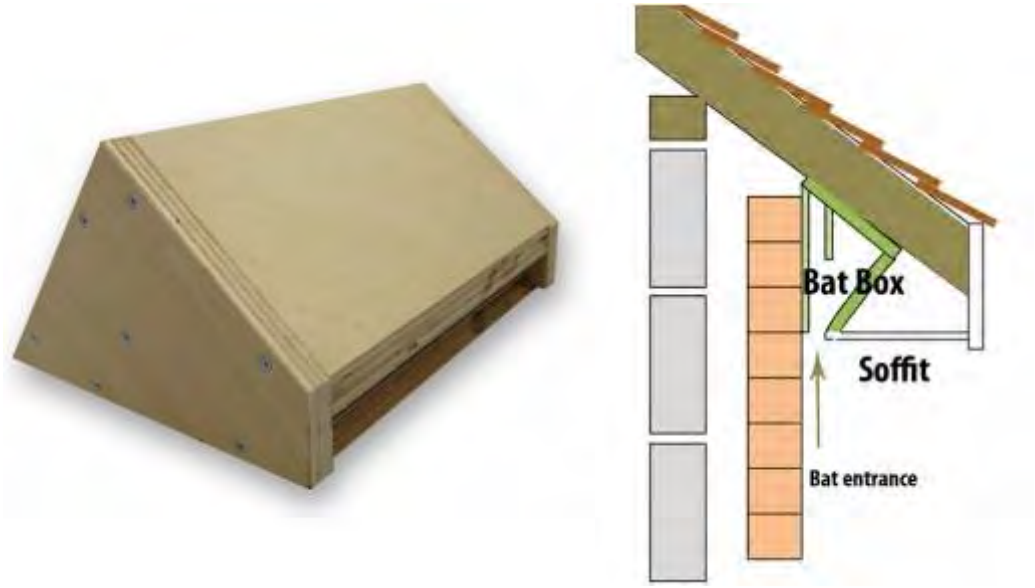
Integrated bat box

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.



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 Greenwoods Ecostyrocrete Bat Box.

See - https://www.greenwoodsecohabitats.co.uk/shop

Ridge access

Where appropriate, 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.

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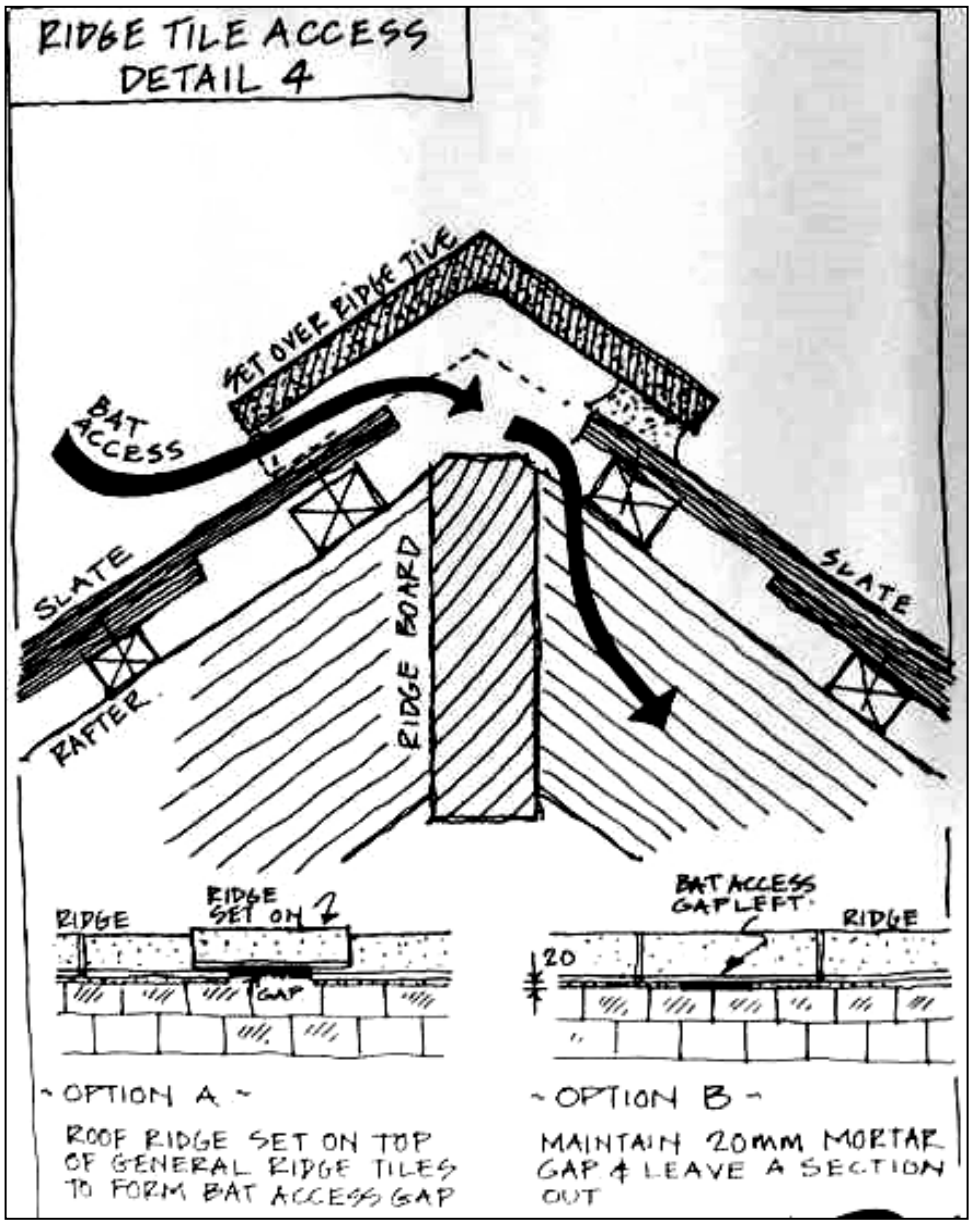

RIDGE TILE ACCESS DETAIL 4
SET OVER RIDGE TILE
BAT ACCESS
SLATE
RAFTER
RIDGE BOARD
SLATE
RIDGE
RIDGE SET ON
GAP
BAT ACCESS GAP LEFT
RIDGE
20
~ OPTION A ~
ROOF RIDGE SET ON TOP OF GENERAL RIDGE TILES TO FORM BAT ACCESS GAP
~ OPTION B ~
MAINTAIN 20mm MORTAR GAP & LEAVE A SECTION OUT

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

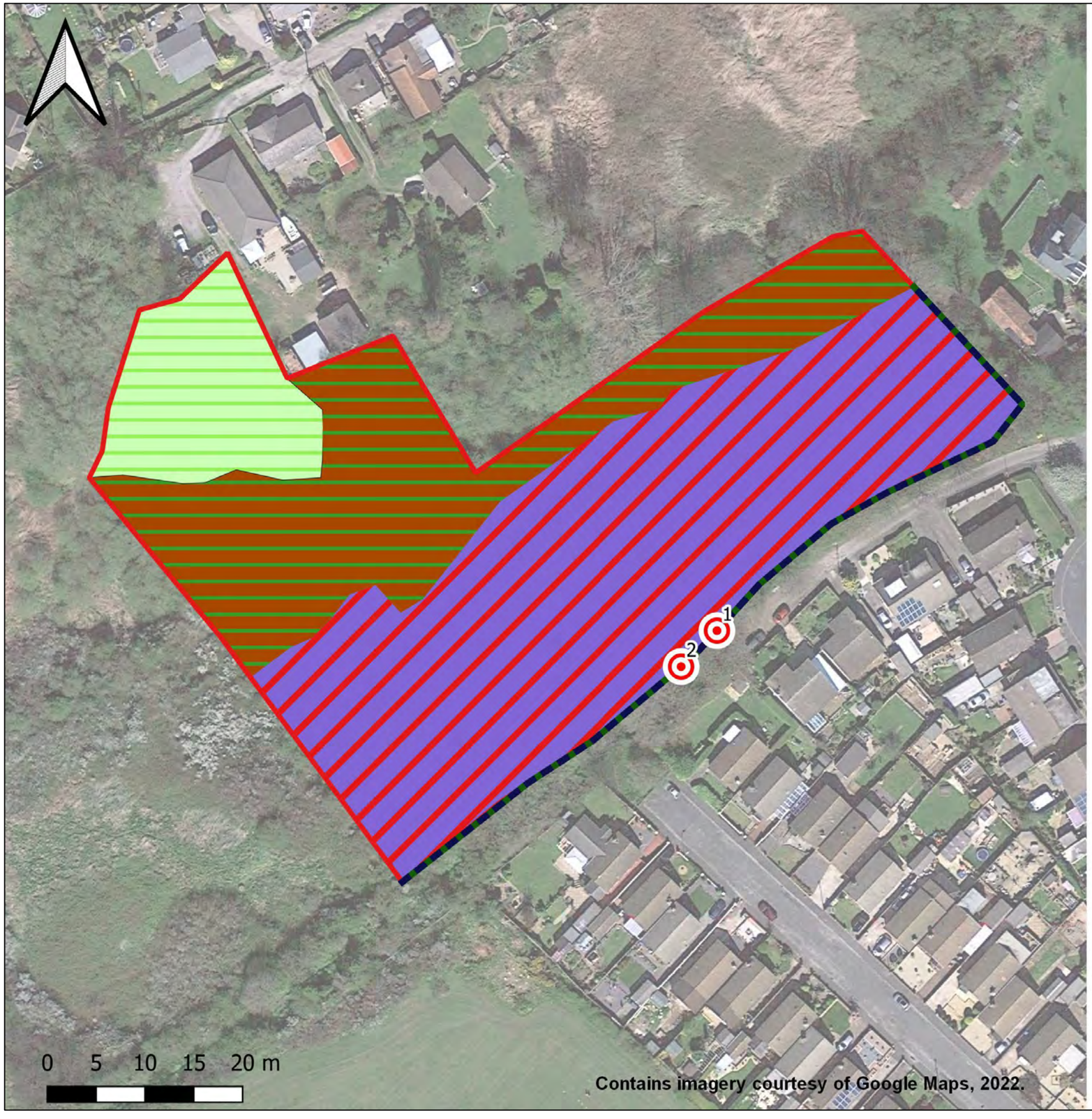
Hedgehog numbers have dramatically declined in recent years. Research suggests that this is partly because it is becoming harder for hedgehogs to move freely due to an increase in the number of solid walls and fences being erected around gardens. This reduces the available foraging area and so restricts 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

UKHabs Map Legend

- w1g6 - LINE OF TREES
- g3c 64 - OTHER NEUTRAL GRASSLAND
  64 mown
- h3 11 78 - DENSE SCRUB
  11 scattered trees, 78 abandoned
- w1f - LOWLAND MIXED DECIDUOUS WOODLAND
- Target Note
  1 - Location of Variegated Yellow Archangel (INNS)
  2 - Location of Montbretia (INNS)
- Boundary

Land to the rear of Maes Muriog

Survey Date: 24/06/2022
Drawn: Miss. K. Judson
Date Drawn: 01/07/2022
Checked & Approved: Mrs. K. Wilding
Size: A3
Scale: 1:1800

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