

GOULD ECOLOGY

Ecological Consultants

Proposed New Housing on

**Land adjacent to 'The Beeches'
Spring Gardens
Whitland
Carmarthenshire
SA34 0HP**

Preliminary Ecological Appraisal

January 2021

(Version 2 - Draft)



Document Information

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New Housing	Land adj. 'The Beeches', Spring Gardens, Whitland, Carmarthenshire SA34 0HP Grid Reference: SN 2059 1679	Owen and Owen Chartered Surveyors	Oct 2020

Fieldwork	Personnel	Date
Extended Phase 1 Habitat Survey	Richard Gould ACIEEM MA BSc	28 th Oct 2020

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Disclosure

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

Signed



Richard Gould

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Executive Summary

<p>Project Details: Proposed new housing on land adjacent to The Beeches, Spring Gardens, Whitland, Carmarthenshire SA34 0HP. Central Grid. Ref. SN 2058 1680.</p>	
<p>Site Description: The site was an agricultural grassland field crossed by a stream and with a patch of unmanaged marshy grassland. It lies on the edge of the town on Whitland.</p>	
<p>Survey Methods: Walkover / Extended phase 1 habitat survey conducted on the 28th October 2020</p>	
<p>Key Findings:</p> <ul style="list-style-type: none"> • Site boundaries on the eastern and western margins comprised continuous native tree line - <i>priority</i> habitat features; • The stream crossing the site connects with the Afon Gronw 150m to the west; • Approximately 3939m² marshy grassland habitat occurred within the site; • Boundary tree-lines had potential value to bats (roosting and commuting), and had some features indicating suitability for dormouse (sub-optimal / lower probability of occurrence). • Some habitats at the site also had potential value for nesting birds, hedgehog and occasional use by grass snake; • Badger and otter are likely to be active in the vicinity, and could potentially disperse through the site or forage in the area on an occasional basis. 	
<p>Appraisal</p> <p>In the absence of mitigation or impact avoidance measure, development at the site would have potential to cause adverse ecological impacts to the following ecological features:</p> <ul style="list-style-type: none"> • Continuous hedgerows (tree-lines), Stream connected to the River Gronw (<i>Priority habitats</i>), • Marshy grassland (<i>Habitat valued at the District Scale</i>), • Bats, Dormice and Otter (<i>Conservation of Species and Habitats Regulations, 2017</i>), • Nesting birds and Grass snake (<i>Wildlife and Countryside Act, 1981</i>), • Hedgehog (<i>Priority species</i>). <p>However, it would be possible to avoid, mitigate or compensate all potentially adverse impacts through construction methodologies which protect valuable ecological features, by retaining and protecting the most valuable habitat features (tree lines, stream corridor) and by designing a scheme of habitat creation and enhancement.</p>	
<p>Summary of Ecological Mitigation Recommendations</p>	
<p><i>Construction Phase</i></p>	<p><i>Medium - Long Term</i></p>
<ul style="list-style-type: none"> • Protection of tree lines and stream corridor from physical damage; • Pollution control measures implemented; • Pruning of trees to be undertaken under ecological method statement as required; • Site clearance methods to include measures to minimise the risk of disturbing nesting birds, hedgehog and reptiles; • Pre-commencement check for any new badger setts at the site. 	<ul style="list-style-type: none"> • Tree-lines on the eastern and western boundaries to be retained in the long term with habitat buffer; • Stream corridor to be retained in the long term with habitat buffer; • Mature oak trees on the northern boundary to be retained • Site drainage to be designed to avoid pollution risks to the watercourse; • Night-time illumination of tree lines on the eastern and western boundaries to be avoided; • A scheme of habitat creation and enhancement to be implemented to the north of the stream.

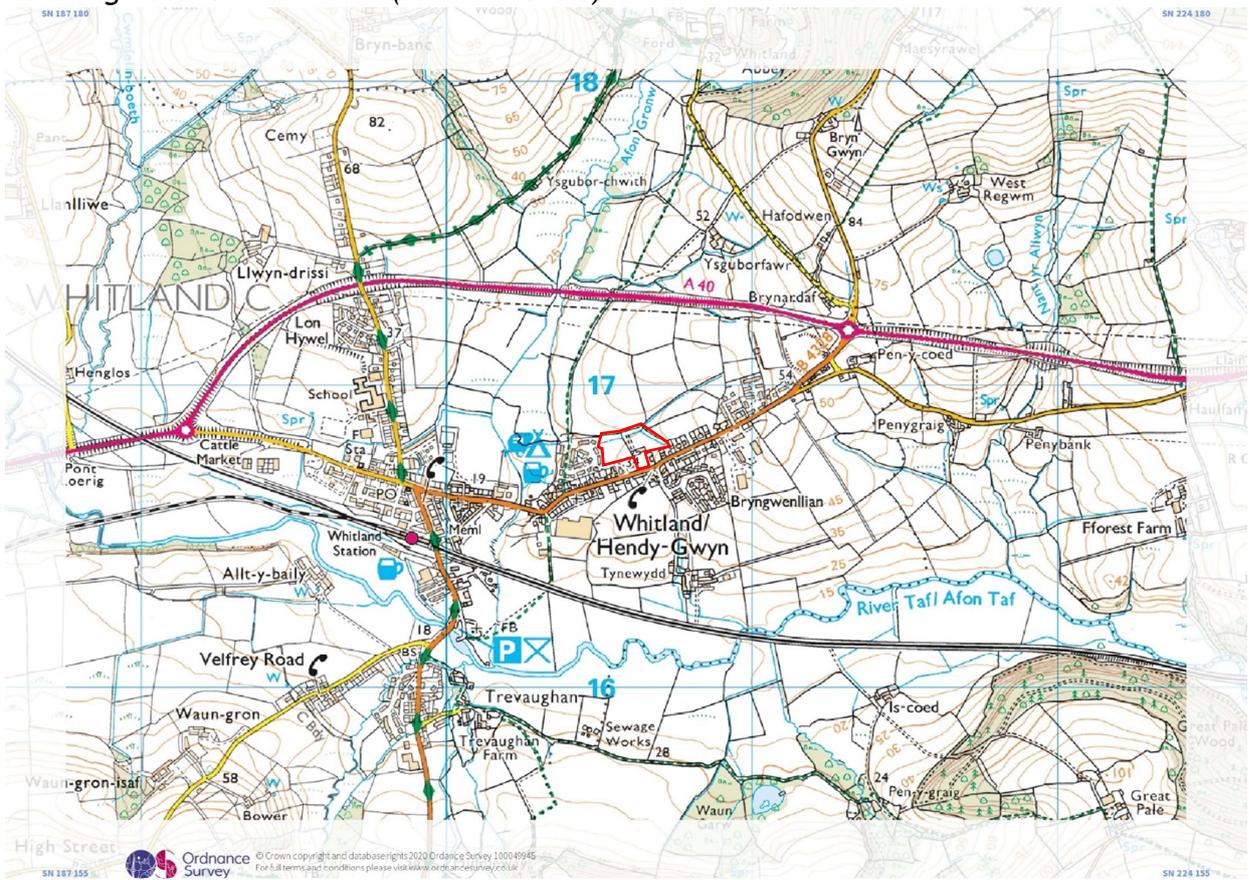
1 Introduction and background

- 1.1 This report is a Preliminary Ecological Appraisal (PEA) relating to the proposed development of new housing on land adjacent to The Beeches, Spring Gardens, Whitland, Carmarthenshire SA34 0HP. Central Grid. Ref. SN 2058 1680.
- 1.2 In October 2020, Gould Ecology were commissioned to undertake the study for the purpose of informing the project design and to accompany the planning application.

Site Location

- 1.3 The site was located to the north of the B4328, on the edge of the town of Whitland. It bordered residential development to the west and south, and open countryside to the east and north, as shown in Figure 1, below.

Figure 1: Site Location (1:25 000 Scale)



Report aims

1.4 The aims of this report were to:

- Identify and describe the habitats and ecological features within the site and immediate surrounding area;
- Identify any designated sites, priority habitats and protected or priority species which are present (or potentially present) within the zone of influence of the project and could be affected by the proposed works;
- Provide an appraisal of the significance and implications of any potential ecological impacts which may be caused by the project;
- Identify any further surveys or other work necessary to complete the impact assessment;
- Provide recommendations for delivering appropriate impact avoidance, mitigation and ecological enhancement strategies in line with legislative and planning requirements.

Key Terminology

1.5 The following Key Terms are used within this report:

- '*Ecological feature*' is the term used to denote any habitat, species or site under consideration within the ecological appraisal.
- '*Construction Zone*' - the area in which works are taking place - including those areas used for vehicle access and parking, materials storage, temporary buildings and compounds.
- '*Zone of Influence*' - the area in which ecological features may be affected by the proposed works. This may often extend beyond the construction zone, and will vary according to the feature described.
- '*Ecological impact*' is the term used to denote actions (associated with the project) resulting in changes to an ecological feature. For example - the action of removing a hedgerow.
- '*Effect*' - the outcome on an ecological feature from an impact. For example - the *effect* on dormouse populations of the removal of a hedgerow.

Personnel

1.6 The site visit and reporting were conducted by Richard Gould, ACIEEM MA BSc.

1.7 Richard is an ecological consultant with over 15 years' experience. He is an Associate member of the Chartered Institute for Ecology and Environmental Management and has extensive experience conducting Extended Phase 1 Habitat surveys, Phase 2 protected species surveys and Ecological Impact Assessments.

2 Legislative and Planning context

2.1 Wildlife and Biodiversity in Wales are protected to varying degrees through legal statute and planning policy.

2.2 The following key wildlife legislation is relevant to this project:

- The **EU Habitats Directive** and **EU Wild Birds Directive**;
- The **Conservation of Species and Habitats Regulations (2017)**, which enacts EU Directives into UK law. Species protected under this legislation are known as European Protected Species (EPS).
- The **Wildlife & Countryside Act (1981, as amended)**;
- The **Environment (Wales) Act (2016)**, in conjunction with the **Wellbeing of Future Generations (Wales) Act (2015)**, the **Nature Recovery Plan for Wales (2015)** and the **Planning (Wales) Act (2015)**;
- The **Protection of Badgers Act (1992)**.

2.3 A number of **Sites, Habitats and Species** are included within the legislation. The following paragraphs summarise the key aspects relating to each, with particular reference to those relevant to development proposals. A more detailed summary is provided in Appendix C, and for further clarification, it is recommended that the legislation is referred to directly, and (if necessary) legal advice is sought.

Designated Sites

2.4 ***Designated Sites*** are sites which are protected for their importance to biodiversity. These include:

- **Special Areas of Conservation (SACs), Special Protected Areas (SPAs) and Marine Protected Zones (MPZs)** - sites of international importance, protected under EU and UK legislation (*The Conservation of Habitats and Species Regulations 2017*);
- **Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs)** - sites of national importance, protected under UK legislation (*Wildlife and Countryside Act (1981)*).
- **Sites of Interest for Nature Conservation (SINCs) and Local Nature Reserves (LNRs)** are of importance at the regional or local level, and are protected within planning policy guidance.

Priority Habitats and Species

2.5 A number of ***Priority Habitats and Species*** are listed as being of principle importance to wildlife conservation in Wales within *Section 7 of the Environment (Wales) Act (2016)*. In general, projects which would cause adverse impacts to priority habitats or species would not be granted planning permission without appropriate mitigation.

2.6 The Section 7 lists of Priority Habitats and Species for Wales can be downloaded from <https://www.biodiversitywales.org.uk/Environment-Wales-Act>.

Protected Species

- 2.7 A range of **legally protected species** are included within different pieces of legislation, which offer varying forms of protection. Many protected species are also priority species, but also have specific legal protection from particular actions.
- 2.8 Commonly occurring examples of protected species include:
- **Bats** (*Conservation of Species and Habitats Regulations, 2017 and Wildlife and Countryside Act/WACA, 1981, as amended*);
 - **Dormice** (*Conservation of Species and Habitats Regulations 2017 & WACA*);
 - **Otter** (*Conservation of Habitats and Species Regulations 2017 & WACA*);
 - **Great crested newt** (*Conservation of Species and Habitats Regulations 2017 and WACA*);
 - **Water Vole** (*Wildlife and Countryside Act, 1981 - Full protection*)
 - **Marsh Fritillary Butterfly** (*Wildlife and Countryside Act, 1981 - Full Protection, Conservation of Species and Habitats Regulations 2017 - protection of core habit areas*);
 - **Reptiles** - slow worm, grass snake, common lizard and adder - (*Wildlife and Countryside Act, 1981 - Partial protection*). Rare and locally occurring species (Smooth snake, Sand Lizard) have additional protection under the *Conservation of Species and Habitats Regulations*.
 - **Badgers** (*The Protection of Badgers Act, 1992*). Includes protection of badger setts from digging or disturbance;
 - **Nesting Birds** (*Wildlife and Countryside Act, 1981*) Protected from disturbance when active, additional protection is given to certain rare or sensitive species listed in Section 1 of the Act).
 - **Certain rare plants and invertebrates** are also protected within the *Wildlife and Countryside Act, (1981)*.
- 2.9 This list is not exhaustive, and there are many more protected species which may occur within specific locations in the country and/or in particular habitats.

Licensing

- 2.10 Any action which might breach the legislation in relation to protected species would risk causing a criminal offence (e.g. destroying a bat roost). In some cases it is possible to gain a licence from Natural Resources Wales (NRW) to permit otherwise unlawful actions.
- 2.11 There are two main forms of licence (in the context of development) - a **survey licence** held by individuals to permit certain survey techniques for protected species and a **development or derogation licence** for a particular project (e.g. a development) which might cause an offence - (e.g. to disturb a bat roost). Projects requiring development licences must meet certain criteria, and applications must contain a detailed method statement prepared by an ecologist to ensure that effective mitigation measures are delivered.

Invasive Species

- 2.12 A number of **invasive plant species** are listed within the Wildlife and Countryside Act (Schedule 9, part II), which includes the commonly occurring **Japanese Knotweed**, as well as a number of other terrestrial and aquatic plants. In the context of development, these must not be caused to spread off site.

Planning Policy

- 2.13 Local planning policy is informed by National Planning Policy, which includes provision for protection of wildlife and biodiversity under Technical Advice Note (TAN) 5.
- 2.14 Specific policy guidance relating to biodiversity varies by local authority, and can be found within the appropriate Local Development Plan or Supplementary Planning Guidance. A summary of the relevant local policies is provided in Appendix C
- 2.15 In general, development projects with the potential to cause significant adverse ecological effects or to breach the legislation are required to submit sufficient information to ensure that such risks are assessed. This will be based on site surveys which describe the existing ‘baseline’ ecological conditions.
- 2.16 Where the risk of causing a legal offence or a significant adverse ecological effect has been identified, the project design must incorporate appropriate impact avoidance, mitigation or compensation measures, as required under UK legislation and planning policy.
- 2.17 Section 6 of the Environment (Wales) Act 2016 also places a ‘**Biodiversity and Resilience of Ecosystems Duty**’ on planning authorities to “maintain and enhance biodiversity” where it is within the proper exercise of their functions. In doing so, public authorities must also seek to “promote the resilience of ecosystems”.
- 2.18 Therefore, it is usually a requirement that development proposals can demonstrate that there will be no net loss to biodiversity caused by the proposals, and that appropriate ecological enhancements are integrated into the project design.

3 Methodology

Survey Scope

- 3.1 The survey area comprised the proposed site area and its boundaries, as shown in Figure 1, above and the Phase 1 Habitat Map provided in Appendix A
- 3.2 The appraisal included consideration of all those **designated sites, priority habitats, protected species and priority species** which occur, or potentially occur, within the *zone of influence* of the project.
- 3.3 In addition, habitats and species which have ecological value at the scale of the *site* or *district* were considered where relevant (for instance, in relation to the conservation of biodiversity at the site and the development of ecological enhancement strategies).
- 3.4 The *zone of influence* for the project was considered to be the proposed development site area, but also included consideration of potential ecological effects to adjacent habitats or sites, functionally connected habitats (e.g. those linked by watercourses or hydrology), or to mobile species occurring in the wider area.

Desk Study Methods

- 3.5 Aerial photographs (Google Earth Pro) and Ordnance Survey maps were used to gain an overview of the study area and surrounding habitat connectivity.
- 3.6 A data search from West Wales Biodiversity Records Centre was made, which included existing records of protected and priority species to 2km from the site.
- 3.7 Details of designated sites within 2km of the site were obtained using the Multi-Agency Geographic Information Centre (MAGIC) Interactive Map.

Field Survey Methods

Extended Phase 1 Habitat Survey

- 3.8 On the 28th October 2020, an extended Phase 1 Habitat Survey was conducted at the site by Richard Gould.
- 3.9 The distribution of habitats and features within the survey area was recorded based upon the JNCC guidelines for Phase 1 Habitat Survey (2010).
- 3.10 The site and wider area was assessed for its potential to support any protected or priority species of flora or fauna, as well as any invasive species. This included:
 - *Bats* - an assessment of the presence and value of potential roost features and an assessment of the value of habitats for foraging and commuting;
 - *Dormice* - an assessment of the value of features on site and adjacent habitats to dormice;
 - *Water vole and otter* - an assessment of the value of habitats within the zone of influence of the project to these species - notably watercourses which may contain breeding sites or resting places;

- *Badger* - a search for signs of presence including holes, trails, feeding remains and latrines. Identification of the presence of any setts and characterisation of the use of setts where applicable;
- *Reptiles* - assessment of the value of habitats and features to reptiles within the zone of influence of the project;
- *Amphibians* - assessment of the value of habitats on site and in the surrounding area to amphibians. Risk assessment of the potential presence of great crested newt based upon known geographical distribution, existing records habitat on site and presence of nearby ponds;
- *Birds* - identification of any habitat of potential value to nesting birds. Assessment of the risk of disturbance to any Schedule 1 bird species likely to occur on site or in the wider area.
- *Invertebrates* - assessment of the value of habitats on site to invertebrates based upon geographical distribution, field identification (where applicable) and existing records.
- *Protected or priority plants* - positive identification or risk assessment of occurrence based upon habitats field recording and existing records.
- *Invasive Species* - Identification of the presence of Schedule 9 and other invasive species on site or in the immediate vicinity.

Value criteria

3.11 In order to inform the significance of any ecological impact, ecological features within the survey area were valued according to their importance on a geographic scale. Determination of value was based on a range of criteria, discussed within CIEEM (2018) '*Guidelines for Ecological Impact Assessment in the United Kingdom*'. The following paragraphs describe the terminology used for valuation, with an indicative guide to their application:

- *Negligible* - Negligible ecological value at any scale - e.g. areas of hardstanding, bare ground, road surfaces etc.
- *Site/ Zone of influence only* - Features which contribute to the biodiversity of the site or immediate surrounding area - e.g. habitats supporting commonly occurring or non-priority species.
- *'District'* - Habitats and species of importance to the district, but not the County or Region. May include local wildlife sites or habitats containing non-priority species assemblages which are distinctive or notable at the local level.
- *'Regional'* - Habitats and species of importance at the county or the regional level, which may include features listed on Local Biodiversity Action Plans and Section 7 lists, as well as SINCS and County Wildlife Sites.
- *National* - Habitats and species of national importance - this may include SSSIs and National Nature Reserves, as well as sites of importance to priority or protected species or species assemblages.
- *International* - Sites containing habitats or species of international importance, including those covered by international legislation, such as Special Areas of Conservation or Special Protected Areas, Biosphere Reserves or Marine Protected Areas, as well as sites supporting populations of priority species of international importance.

- 3.12 Determination of value was then used to assess the likely significance of any ecological effects which may be caused by the proposed works. Assessment of significance is broadly based upon the *sensitivity* of the resource affected and the *magnitude* of the impact.
- 3.13 Where project actions have potential to cause *significant* effects, further survey work or impact avoidance or mitigation strategies are required. It should be noted that within a Preliminary Ecological Appraisal (PEA), it may only be possible to provide an indicative assessment of likely value until further work has been conducted.

4 Results - Baseline Conditions

Site Overview and Setting

- 4.1 The site was an area of land adjacent to existing residential development within the town of Whitland. Habitats in the surrounding area comprised agricultural grassland with a network of native tree-lines and hedgerows, residential and commercial development, and two rivers (the Afon Taf to the south and the Afon Gronw to the west).

Figure 2: Overhead plan showing the site in relation to surrounding habitats.



Designated sites

- 4.2 There were no statutory designated sites found to occur within 2km of the development site, nor any bat related SACs and SSSIs within 10km.

Habitats

- 4.3 The following paragraphs describe the habitats and features which were identified within the survey area. A phase 1 habitat map is provided within Appendix A, photographs are provided within Appendix B
- 4.4 Flora and fauna are referred to by their common names only within the text. Species names and abundance for each habitat type are provided within Appendix C. Species abundance was described using the DAFOR scale: 'Dominant', 'Abundant', 'Frequent', 'Occasional' or 'Rare'.

Poor Semi-Improved Grassland

- 4.5 The main area of site comprised *poor semi-improved* grassland, the majority of which had recently been managed by cutting for silage. A small section of grassland between the stream and the northern margin of the site had not been cut, and supported a denser, tussocky sward.
- 4.6 The habitat was characterized as *poor semi-improved* grassland as the plant diversity was relatively limited and dominated by species indicative of nutrient enrichment for agriculture.
- 4.7 Yorkshire fog was the dominant grass species. Creeping buttercup, white clover, cocksfoot, dandelion and dock species were also frequent. Patches of locally abundant soft rush occurred occasionally.
- 4.8 Grassland which is regularly mown for silage supports relatively few species, and many grasses and herbs are not able to flower. The *poor semi-improved* grassland habitat was considered to have ecological value at the scale of the *Site*.

Marshy Grassland

- 4.9 A patch of marshy grassland occurred on the western side of the site, and also extended along the sides of the stream corridor. The marshy grassland habitat was unmanaged at the time of survey, and had a dense, tussocky sward.
- 4.10 The habitat was dominated by soft rush, with abundant wild angelica, frequent meadowsweet, Yorkshire fog, greater bird's foot trefoil and common marsh bedstraw, occasional sharp-flowered rush, greater plantain, ribwort plantain, docks, cock's foot, marsh thistle and marsh willowherb. Willow saplings, dog rose and bramble occurred rarely
- 4.11 The habitat type was classified as *Marshy Grassland* according to Phase 1 Habitat terminology, and the species composition was indicative of the National Vegetation Classification (NVC) M23 *Juncus effusus/ acutiflorus-Galium palustre Rush Pasture*.
- 4.12 The *Wildlife Site Guidance for Wales* document states that species-rich examples of M23 Rush Pasture (as well as other species-rich marshy grassland habitat types (M22 - M27) meet the criteria for selection as a 'Local Wildlife Site'. In addition, species rich examples of this habitat type would potentially fall within the Section 7 Priority Habitat definition for *Purple Moor Grass and Rush Pasture*.
- 4.13 The *Wildlife Sites Guidance for Wales* document provides a list of indicator species for this habitat type, of which 8 were noted during the survey visit. This indicates a

moderate diversity of species (taking into account that the survey visit was conducted outside of the main botanical survey season, and some species were likely to have been missed).

- 4.14 The marshy grassland was not considered to be species rich, and hence was not considered to fall within the *Priority* habitat classification.
- 4.15 Nevertheless, the habitat would be likely to support a range of invertebrates, amphibians and small mammals, and was considered to have value at the scale of the *District*.

Running Water

- 4.16 A small stream flowed from east to west across the northern part of the site, which connected with tree-lined stream corridors on each side of the site. Typically, the stream was relatively shallow (10 - 20cm) and less than 1m in width.
- 4.17 The habitat strip either side of the stream comprised marshy grassland with stands of bramble scrub. Further species noted within the stream or its banks, included fool's water cress, brooklime and hemlock water dropwort.
- 4.18 Tree-lined wet ditches also occurred on the western and eastern margins of the site, which flowed north to connect with the stream.
- 4.19 The stream corridor connected with the Afon Gronw 250m to the west, both hydrologically and by habitat linkage. Therefore, the stream was considered to have ecological value at the *Regional* scale, as it was functionally connected with the Afon Gronw ('near natural' Rivers are a *Priority* habitat).

Tree Lines and Hedgerows

Western and Eastern Margins

- 4.20 Continuous, native tree lines occurred on the western and eastern margins of the site. These included mature or semi-mature oak, ash, sycamore and grey willow trees, with hawthorn, hazel and holly in the understorey.
- 4.21 The tree lines are likely to provide value to a range of species, including birds, invertebrates, small mammals and amphibians. A small number of potential bat roost features (PRFs) were noted, which included cracks, knot holes and a woodpecker hole. The locations of trees containing PRFs are shown in Appendix A (Target Notes 3 - 6).
- 4.22 The continuous tree lines on the western and eastern fall within the Biodiversity Action Plan habitat description for *Priority* hedgerows, which includes the following definition:
- 4.23 "A hedgerow is defined as any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less than 20m wide (Bickmore, 2002)... All hedgerows consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are covered by this priority habitat."

- 4.24 Therefore, the tree-lines on the western and eastern margins were valued at the *Regional* scale.

Northern Margin - Mature trees (discontinuous)

- 4.25 There was no continuous demarcation of the northern margin of the site, which was continuous with the adjacent grassland field to the north (which had recently been cut for silage). However, a line of six mature oak trees occurred on the eastern side of the northern boundary (which may have formed part of a historical field boundary).
- 4.26 The mature oak trees did not represent a continuous hedge, but are likely to provide value to birds, invertebrates and small mammals. Several potential bat roost features were noted, included knot holes, a woodpecker hole and crevices at the base (potentially leading to larger cavities within the trunks).
- 4.27 In addition, a mature ash, oak and holly tree occurred on the western side of the northern margin. Further potential bat roost features were noted (notably, small hollows at the base of the oak).
- 4.28 The mature oak trees were considered to have ecological value at the *District* scale.

Southern margin (Native hedgerow)

- 4.29 A small section of native hedgerow (approx. 15m) occurred on the southern margin, adjacent to the road entrance. The hedgerow was trimmed to around 2.5m in height and was dominated by hawthorn, with occasional ash and dog rose. Ivy and bramble were also frequent.
- 4.30 The hedgerow is likely to provide a small area of habitat of value to birds, invertebrates and small mammals at the scale of the *site*, although it did not meet the criteria for inclusion within the priority habitat description for hedgerows due to its length (less than 20m - refer to Section 4.21).

Fences and Walls

- 4.31 The majority of the southern margins comprised timber or chain link fences which bordered residential gardens.
- 4.32 A concrete block wall bordered the adjacent property to the east, and brick and block walls surrounded the courtyard and gardens of the buildings within the survey area.
- 4.33 All walls were in good condition, with negligible suitability for bat roosting or other crevice dwelling animals.
- 4.34 The walls and fences were considered to have *negligible* ecological value.

Disturbed ground / hard surfaces

- 4.35 A compacted gravel access track led from the road to the buildings on site, and a hardstanding courtyard surrounded the buildings.

- 4.36 Paths around the buildings were paved. The gravel area and to a parts of the hardstanding had been colonized by pioneering and ephemeral species such as groundsel, sow thistle, ragwort, willowherbs, bittercress, thistles and plantains.
- 4.37 All areas of disturbed ground and hard surfaces were considered to have *negligible* ecological value.

Buildings

- 4.38 Two unoccupied residential dwellings occurred within the survey area. These were of brick construction with slate roofs and PVC fascias. Their potential value to bats and nesting birds was assessed.
- 4.39 Generally, the buildings were in good condition - there were no cracks or crevices suitable for bat roosting or bird nesting within the walls, and the soffits and fascias were well sealed.
- 4.40 The roofs were also in good condition. However, gaps large enough to admit crevice dwelling bats were noted between the tile-edges and fascias of the gables on the eastern building. In addition, small gaps were noted beneath some ridge tiles on both buildings, and it could not be confirmed from the ground whether these provided potential bat access to the under-tile space.
- 4.41 An internal inspection of the buildings was not carried out, as it was understood that the buildings would not be directly affected by the proposed development.

Habitats in the Wider Area

- 4.42 Residential dwellings with gardens lay adjacent to the site to the west and south. An agricultural grassland field adjoined the site to the north, and further agricultural grassland occurred to the east.
- 4.43 The stream passing through the site connects directly with the Afon Gronw approximately 250m to the west, which in turn connects with the Afon Taf, approximately 500m to the south.

Protected and Priority Species

Bats

Existing Records

- 4.44 The following paragraphs summarise the existing records for bats provided by WWBIC within 2km of the site:
- Common pipistrelle, soprano pipistrelle, brown long-eared and noctule bats have been recorded within 1km of the site (the nearest record for each of these species was 638m to the west in 2012).
 - In addition to the bat species listed above, greater horseshoe and Natterer's bats have been recorded within 2km and lesser horseshoe and Daubenton's bats have been recorded just over 2km from the site.

- 4.45 The total number of bat records within 2km of the site was 21, with no records closer than 638m.

Roosting

- 4.46 Several trees with potential bat roost features were noted on the eastern, western and northern site margins, which included knot holes, woodpecker holes, basal cavities and cracks (Locations of the trees are shown in Appendix A).
- 4.47 The buildings within the survey area also had potential for bat roosting - notably gaps at tiles edges and beneath ridge tiles, as described in the *Buildings* description, above.

Foraging and commuting habitat

- 4.48 The continuous tree lines on the western and eastern margins are likely to provide good quality commuting and foraging habitat for local bats. These features connect with hedgerows and vegetated water-courses in the surrounding area.

Dormouse

Existing Records

- 4.49 No existing records for dormouse were found within the search area.

Habitat Potential

- 4.50 The tree lines on the western and eastern site boundaries offered habitat of some potential value to dormice, as follows:
- 4.51 The tree lines provide continuous vegetation which links with tree lines and hedges in the wider area. Species present included pedunculate oak, hazel and bramble (considered key species for dormice).
- 4.52 However, the tree-lines were dominated by mature, closed canopy trees with very limited shrub cover. Bramble, and hazel were relatively infrequent.
- 4.53 Furthermore, the area of the habitat was limited, (each tree-line was around 100m in length). Larger blocks of higher quality habitat (e.g. semi-natural woodland) were rare in the surrounding area.
- 4.54 These factors, combined with the absence of records for the species within 2km of the site, indicate that the likelihood of dormouse occurring within the tree lines on the site margins is *very low*.
- 4.55 The small stretch of hedgerow on the southern boundary of the site is isolated from other suitable habitats and was considered very unlikely to support dormice.

Otter and Water Vole

Existing Records

- 4.56 WWBIC held eight records for otter within 2km of the site, although only two were within ten years (both 2010). The records were mainly within with the Afon Gronw and the Afon Taf.
- 4.57 There were no records for water vole within the search area.

Habitat Potential

- 4.58 It is possible that otter disperse along the stream corridor running through the site on an occasional basis, but the stream banks were not of sufficient size to support a holt, nor to provide regular foraging habitat.
- 4.59 The stream was too shallow, narrow and fast-flowing to be suitable for water vole, and no signs of their presence were found.

Badger

Existing records

- 4.60 WWBIC held seven records for badger within the search area, and only one record from within 10 years. The nearest record was 703m to the east of the site (1985). The most recent record was 1km to the north-west of the site, bordering the A40 (2010).

Field Signs

- 4.61 No setts, latrines, foraging marks or distinctive, well-worn trails were noted within the site or in adjacent areas. Indistinct mammal trails were noted throughout the site. However, these were more characteristic of fox than badger.
- 4.62 Badger probably occur in the vicinity and may forage within the site, but there was evidence of significant use.

Hedgehog

Existing Records

- 4.63 WWBIC held eleven records for hedgehog within the search area. Of these, five were from within the last ten years. The nearest and most recent record occurred at a property immediately to the south of the site, beyond the B4328 (2019).
- 4.64 Further records for the species have been made within the town of Whitland.

Habitat Potential

- 4.65 Grassland within the site could be used for foraging by hedgehog, and the tree-lined boundaries on the margins could be used for refuge and dispersal. Two brash piles

occurred on the site (Appendix A, Target Notes 1 and 2), which could be used for refuge or hibernation.

Birds

Existing Records

- 4.66 Priority bird species recorded within 1km of the site include: redwing, starling, house sparrow, bullfinch, brambling, linnets, kingfisher, dunnock, red kite, song thrush and fieldfare.

Habitat Potential

- 4.67 The trees and hedges on the site boundaries, areas of scrub and the brash piles (shown on the habitat map in Appendix A) had potential to be used by nesting birds.
- 4.68 The marshy grassland habitat could potentially be used by ground nesting birds. However, there have been no recent records for ground-nesting species in the near vicinity (meadow pipit and skylark were recorded 1.7km from the site in the early 1980s), and the habitat area was relatively small. Therefore, this was considered relatively low risk
- 4.69 No large nests indicative of red kite or other raptors were noted.

Reptiles and Amphibians

Existing Records

- 4.70 The only reptile record held by WWBIC within search area was for an adder, 1.9km from the site (2002).
- 4.71 Common frog, common toad and palmate newt have been recorded infrequently within the search area, and all records were over 1km from the site.

Habitat Potential

- 4.72 The grassland habitats on site would have relatively low value to reptiles when grazed or cut for silage, but could be used by common amphibian species for dispersal and foraging when the sward height is long.
- 4.73 The marshy grassland habitat is likely to be used by common amphibian species for foraging and dispersal. Grass snake may occasionally forage within this habitat, and may also use the stream corridor and tree-lines for dispersal.
- 4.74 Other reptile species (slow worm, common lizard and adder) were considered unlikely to occur due at the site to the lower suitability of the habitats for these species and the lack of connectivity with habitats of higher value.

- 4.75 Agricultural grassland managed by intensive grazing and/or mowing for silage is generally of low value to reptile species, and the tree-lines on the margins had an extensive, continuous canopy which would have shaded the ground in these areas.

Invertebrates

Existing Records

- 4.76 WWBIC held no records for priority insect species within 1km of the site, nor were there any records for European protected insect species within 2km (other than the historical records discussed in Section 4.75, below).
- 4.77 Two historical records for the freshwater pearl mussel occur within the Afon Taf (1915 and 1922). The species is fully protected under the Wildlife and Countryside Act (1981), and the Conservation of Species and Habitats Regulations (2017). However, there were no recent records for the species.
- 4.78 Marshy grassland habitats can support the Marsh Fritillary Butterfly. However, there were no records for Marsh Fritillary Butterfly within 2km of the site, the habitat area was relatively small and not well connected to other suitable habitats, and the main caterpillar food plants were not noted at the site (Devil's bit Scabious). Therefore, the likelihood of the species occurring at the site was considered to be *very low*.
- 4.79 The site lay within a '*B-line*' area. '*B-lines*' are large scale areas of land which have been identified by the charity 'Buglife' for promoting habitat connectivity for pollinators at the landscape scale. A B-line is not a statutory designation, but represents an opportunity to contribute to the project for the benefit of pollinators.

Priority plant species

- 4.80 There were no records for protected or priority plant species within the site or its immediate vicinity.

Invasive plant species

Existing Records

- 4.81 Montbretia and wall cotoneaster (invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act) have been recorded within the gardens of adjacent residential properties. However, these were not considered to represent a risk to development of to the site.
- 4.82 Himalayan Balsam has been recorded within the Afon Gronw, 250m to the west of the site.
- 4.83 No evidence of exotic, invasive plant species was found within the site. (Refer to Sections 5.6 - 5.9 for limitations of this assessment).

Summary of Key Results

Designated Sites

4.84 No statutory designated sites occurred within the zone of influence of the project.

Habitats

4.85 The eastern and western boundary **tree lines** were *priority* habitat features of ecological value at the *Regional* scale.

4.86 The stream on site connected with the **Afon Gronw** 250m to the west and was considered to form part of the *priority* river habitat of value at the *Regional* scale.

4.87 The **marshy grassland** habitat was considered to have value at the *District* scale.

4.88 **Mature oak trees** on the northern boundary were considered to have value at the *District* scale.

Protected and Notable Species

4.89 A number of trees on the site margins were found to contain **potential roost features**. The tree lines are likely to have value to **bats** for foraging and commuting.

4.90 Badger and otter may occur on site occasionally (primarily for foraging, and whilst dispersing), but were not expected to have a significant presence at the site.

4.91 **Trees, hedgerows, scrub** and **brash** piles were considered likely to be used by **nesting birds** during the breeding season. It was also considered possible that the **marshy grassland** habitat could be used by ground nesting birds.

4.92 **Brash piles** could be used for hibernation by hedgehog or grass snake.

4.93 **Common amphibian species** were considered likely to occur within the marshy grassland habitats (as well as other grassland with a long sward height). **Grass snake** may also occur within the marshy grassland and stream corridor on an occasional basis. Slow worm lizard and adder were considered unlikely to occur at the site.

Invasive Species

4.94 No evidence of exotic, invasive species was noted within the site.

5 Survey Limitations

General

- 5.1 The survey was based on Extended Phase 1 Habitat Survey. This survey method provides an assessment of the broad habitat types in the area, along with an appraisal of the habitat suitability, and presence of field signs, for protected or notable species.
- 5.2 Various species of flora and fauna may only be apparent at certain times of year and, in some cases, may not be apparent every year. Zero observation of a species during a single site visit cannot therefore confirm absence. The Extended Phase 1 Habitat survey can only provide an indication of habitat suitability for the species assessed, and to inform further survey requirements.

Season

- 5.3 The information provided within this report is based on a walkover survey conducted in late October 2020. The season was therefore sub-optimal for botanical survey and not all plant species would have been detected. Several species were only identifiable from the presence of dead stems.
- 5.4 Nevertheless, the species recorded were considered sufficient to identify Phase 1 habitat types for the purposes of the appraisal.

Data Search

- 5.5 Data from the local biological records centre provides evidence of historical records within the search area. Absence of records in an area does not necessarily indicate absence of a species, but could reflect a paucity of recording effort.

Invasive species

- 5.6 Japanese knotweed is usually likely to be detected during a walkover survey, if present. However, under some circumstances the plant (or other invasive species) may not be detected.
- 5.7 Japanese knotweed is dormant during the winter, and only begins to emerge above the ground in spring. Whilst it is usual for larger stands of Japanese knotweed to be evident during the winter (due to the presence of dead stems and bare ground), it is possible for the presence of Japanese knotweed to be concealed by management practices (such as regular cutting and removal of stems). Himalayan balsam is an annual plant which may not be detected during the winter or spring - particularly if it occurs in low abundance.
- 5.8 In some cases, Japanese knotweed rhizomes may extend underground for up to 7m from the visible part of a plant, and may remain undetected beneath the soil until triggered to grow in areas where it has previously not done so through changes to management practices (e.g. cutting/spraying).
- 5.9 Therefore a Preliminary Ecological Appraisal alone should not be used to confirm absence of Japanese knotweed. A targeted survey, conducted at an appropriate time of year would be required for this purpose.

6 Ecological Appraisal

- 6.1 This section contains an appraisal of the potential ecological impacts which may be caused by the development of new housing at the site, both during the construction phase and during operation (in the medium to long term).
- 6.2 Approximate dimensions for each habitat are provided, which were measured using Google-Earth Pro.

Impacts to Designated Sites

- 6.3 Due to the distance of the project site from any designated sites, the risk of adverse impacts to these features was considered to be *very low*.

Impacts to Habitats

Poor semi-improved grassland

- 6.4 The proposals would be likely to cause the loss of all (or the majority) of the poor semi-improved grassland (12565m²) within the site.
- 6.5 The significance of this impact would be at the scale of the *Site*.

Marshy Grassland

- 6.6 The proposals would be likely to cause the loss of 3290 m² of marshy grassland habitat valued at the *District* scale.
- 6.7 Even if this habitat area were retained within the development, without grazing or other management, it would transition to scrub and wet woodland over time.
- 6.8 Loss of this habitat area would cause an adverse ecological impact of significance at the *District* scale, and (without compensation) would cause a net loss to biodiversity at the site.

Stream corridor

- 6.9 The proposals could potentially affect the stream corridor crossing the site (approx. 150m length) in the following ways:
 - Pollution to the watercourse caused during the construction phase - potentially of significance to habitats valued at the *Regional* scale;
 - Loss of the stream as a habitat corridor used by dispersing wildlife across the site;
 - Pollution of the stream (and downstream watercourses) caused by changes to site drainage in the long term) - potentially significant at the *Regional* scale.

Hedgerows, tree-lines and mature trees

- 6.10 It is anticipated that the tree-lines on the western and eastern margins (205m total), as well as existing mature trees on the northern margin (9 trees, totalling approx. 65m length in canopy cover) would be retained within any development of the site.
- 6.11 However, there would potentially be a risk of damage to trees and hedges caused by excavations or compaction of soil in the vicinity of these features (affecting the root systems).
- 6.12 The 15m section of native hedgerow on the southern boundary of the site may need to be removed wholly or in part in order to facilitate access and visibility. If so, this would cause a minor loss of hedgerow habitat of significance at the scale of the *Site*.

Scrub

- 6.13 The proposals would potentially cause the loss of approximately 180m² bramble dominated scrub, of significance at the *Site* scale.

Disturbed Ground

- 6.14 Loss or disturbance to the areas of disturbed ground and hard surfaces (730m²) would have a *negligible* ecological impact.

Buildings

- 6.15 It is anticipated that the buildings (236m²) within the survey area will be retained and unaffected by the proposals. Therefore, no adverse ecological impacts to these features are anticipated.

*Impacts to Species**Bats**Roosting*

- 6.16 No bat roosts would be directly affected by the proposals, provided that the trees containing potential roost features, as well as the existing buildings, are retained.
- 6.17 However, pruning or removal of any trees containing potential roost features would risk disturbing bats or destroying a bat roost.
- 6.18 In addition, night-time illumination of the boundary tree-lines could deter bats from using any roosts within the area affected.

Foraging and Commuting

- 6.19 Provided that tree lines and mature trees are retained, features of potential value to bats for commuting and foraging shall not be directly affected by development at the site.
- 6.20 However, night time illumination of boundary trees would potentially deter some bat species from those areas, and could cause a severance of flight lines.

- 6.21 Species which are considered 'light averse' (i.e. at higher risk of adverse impacts associated with night time lighting) have been recorded within the wider area, and include brown long-eared, greater and lesser horseshoe and myotis species bats.
- 6.22 Therefore, night-time illumination of boundary trees and hedgerows could potentially cause a significant adverse impacts to local bat populations.

Dormouse

Construction Phase

- 6.23 Provided that the tree lines on the western and eastern site margins are protected during the construction phase and retained, there would be no direct disturbance of habitats potentially suitable for dormice.

Medium - Long Term

- 6.24 Residential development can potentially put pressure on any dormouse populations in adjacent hedgerows due to increased human disturbance. However, the probability of dormouse occurrence within the tree-lines was considered to be *very low* and the implementation of a suitable buffer zone between the residential development and boundary tree-lines would minimize this risk.

Otter

Construction Phase

- 6.25 Risks to otter during the construction phase would be *negligible* as the species would be very unlikely to be present when works are being carried out.

Medium - Long Term

- 6.26 Loss of the stream corridor and associated habitat could potentially affect the movement of otter across the landscape. However, this impact can be avoided by retaining habitat connectivity along the stream corridor.

Hedgehog

Construction Phase

- 6.27 The grassland habitats within the site are only of value to hedgehog for night-time foraging, and site clearance works would present minimal risks to the species.
- 6.28 However, the two brash piles at the site could potentially be used by hedgehog for refuge and hibernation, and removal of these features could potentially harm any individuals using them for this purpose.

Medium - Long Term

- 6.29 Development of the site area could potentially could cause the loss of foraging habitat, and potentially affect dispersal of the species throughout the area. However, this could be avoided by retaining habitat connectivity around and throughout the site.

Birds*Construction Phase*

- 6.30 Disturbance or removal of any trees, hedgerow, scrub, brash piles or marshy grassland habitat within the site would have potential to disturb nesting birds if conducted during the breeding season.

Medium - Long term

- 6.31 Development at the site would be very unlikely to cause significant adverse impacts to bird populations in the longer term.

Reptiles and Amphibians*Construction Phase*

- 6.32 Habitat suitability for reptiles at the site was considered to be *low*, and probably limited to occasional use of the stream corridor and marshy grassland by grass snake whilst foraging and dispersing. The brash piles could potentially be used for hibernation by grass snake over the winter period.
- 6.33 Site clearance works therefore carry a low risk of harming reptiles (notably grass snake).
- 6.34 Common amphibian species are likely to be present with the marshy grassland habitat, and clearance works could potentially harm individuals, but would be unlikely to cause significant impacts to amphibian populations.

Medium - Long term

- 6.35 Development at the site would cause a loss of marshy grassland habitat of potential value to common amphibian species and occasional foraging habitat of value to grass snake. The significance of this impact would be relatively minor and limited to the scale of the *site*.

Invertebrates

- 6.36 The proposals would be unlikely to cause significant impacts to invertebrate populations at the site.
- 6.37 However, any pollution of the watercourse could potentially affect invertebrates associated with the down-stream river systems (which potentially include priority species).
- 6.38 The site lies within a *B-Line* - a zone targeted for increasing habitat connectivity of value to pollinators. There would be potential for the project design to contribute towards this goal.

Invasive Plant Species

- 6.39 No evidence of invasive exotic plant species which could potentially cause risks to developing the site were detected during the survey.
- 6.40 However, the site visit was conducted in October. Evidence of species such as Japanese knotweed or Himalayan balsam can usually be detected at this time of year (i.e. dead stems or areas of bare ground). A further check conducted between May - September would be required to confirm presence / absence of these species.

7 Recommendations

Further Survey

- 7.1 Although no evidence of badger was found during the site visit, it is recommended that a pre-construction check for new badger setts is conducted prior to commencing works on site (due to the mobility of the species).
- 7.2 If any boundary trees are to be removed or significantly pruned, this shall be conducted following a check for potential roost features (and further inspection or survey of any features affected as required).
- 7.3 Although no evidence of invasive plant species was detected during the survey visit, it is recommended that a targeted survey for Japanese knotweed or any other invasive species is conducted prior to commencing works on site (between May - September).

Mitigation

- 7.4 This section provides outline mitigation recommendations which address the identified ecological impacts described in Section 6.

Habitats

Marshy Grassland

- 7.5 A significant proportion of the marshy grassland habitat at the site would be lost to the development, potentially causing adverse ecological impacts at the scale of the *district*.
- 7.6 These adverse impacts could be minimized by retaining as much of the marshy grassland habitat on site as possible, and compensated by habitat creation and enhancement on site.
- 7.7 If it has not been possible to adequately compensate for habitat loss on-site, it may be necessary to secure a financial contribution to the conservation of marshy grassland habitats off-site (such as local nature reserves or designated sites). Options for habitat creation and enhancement measures are discussed in Section 7.31 below.

Stream Corridor / Rivers

- 7.8 During construction, the stream corridor shall be protected from pollution or from incidental damage or disturbance.

- 7.9 Construction methods shall include measures to avoid pollution of the watercourse (and the consequent pollution of downstream rivers).
- 7.10 In order to protect the stream corridor in the long term (and the associated habitat connectivity), it is recommended that the stream corridor is retained with a 7m wide habitat buffer on each side.
- 7.11 Site drainage must be designed to avoid the risk of pollution of to the watercourse.

Tree Lines and Mature Trees

- 7.12 It is recommended that the eastern and western tree lines and the mature trees on the northern boundary are retained within the development in the long term.
- 7.13 During construction, the root protection zones of these features shall be protected by suitable fencing.
- 7.14 In order to minimize the risk of disturbance to wildlife associated with the boundary tree lines in the long term, it is recommended that a habitat buffer of minimum 2m be retained between residential development and these features.

Species

Bats

- 7.15 All trees containing potential bat roost features shall be retained where possible
- 7.16 If any tree which must be pruned or removed, it shall be assessed for the presence of potential bat roost features (PRFs). If any PRFs will be affected by the proposed works, the feature shall be subject to bat survey or inspection prior to proceeding, and any necessary mitigation and licensing measures implemented.
- 7.17 The lighting design shall ensure that the trees on the eastern, western and northern boundaries shall not be subject to excessive night time illumination in order to ensure that bats are not deterred from using these features. Methods for minimizing light spill onto ecological features are provided within the BCT/ILP Guidance Note 08-18 *Bats and Artificial Lighting in the UK*.

Dormouse

- 7.18 Dormice are considered very unlikely to occur within the boundary tree lines. Even if they are present in the area, dormice would not be at risk of direct disturbance during construction provided that the boundary tree-lines are retained.
- 7.19 Should any trees require pruning or lopping, it is anticipated that this could be conducted with *negligible* risks to dormice under a precautionary method statement.

Otter

- 7.20 Habitat connectivity for otter shall be retained by ensuring that the stream corridor and associated habitat is protected and retained in the long term.

Badger

- 7.21 Evidence of badger was not found during the survey visit, but a follow-up check for setts should be made prior to any works commencing at the site.
- 7.22 Construction methods should include consideration for the welfare of badgers by ensuring that any trenches or excavations left open overnight include a method of escape to avoid badgers from becoming trapped, and that construction materials shall be stored safely, so as not to pose a hazard to badgers.

Hedgehog

- 7.23 In order to minimize risks to hedgehog during construction, the brash piles shall be removed between 31st August and 1st October (outside of the hibernation season and after the bird nesting season).
- 7.24 In the long term, consideration shall be made within the project design for retaining habitat connectivity across and around the site.

Nesting Birds

- 7.25 Clearance of any trees, hedgerow, scrub, brash piles or marshy grassland habitat shall be undertaken outside of the bird breeding season (1st March - 31st August).
- 7.26 If it is necessary to work within the breeding season, all areas of suitable nesting habitat shall be checked by an ecologist and confirmed clear of nests before commencing. Any nests found shall be protected by a suitable buffer zone (established by the ecologist) until chicks have fledged.

Reptiles

- 7.27 Clearance of any areas of grassland with a sward above 15cm shall be conducted under a method statement which includes the implementation of a sequential vegetation cut to gradually minimize its suitability to grass snake (and other fauna).
- 7.28 Removal of brash piles shall be conducted between 31st August and 1st October (as for hedgehog)
- 7.29 The stream corridor and boundary hedgerows shall be protected during works and in the long term in order to retain habitat connectivity for reptiles.

Habitat Creation and Ecological Enhancement

- 7.30 The following paragraphs outline opportunities for habitat creation and enhancement which could be used to compensate for any habitat losses caused by the project, and potentially to enhance the site for wildlife.
- 7.31 Recommended measures for habitat creation and enhancement include:
- Retention and enhancement of a 7m wide habitat buffer along the stream corridor;
 - Creation of marshy grassland habitat within suitable areas to the north of the stream, and enhancement of existing marshy grassland habitat along the stream

corridor where possible - potentially through translocation of marshy grassland habitat at the site;

- Planting of native trees along the northern boundary of the site (and retention of existing mature trees within this feature);
- Utilisation of SUDs areas for marshy grassland/ wetland habitat creation
- Creation of native hedgerows between plot boundaries and use of wildlife friendly species within landscaped areas;
- Creation of wildflower areas within the landscape design, using species of benefit to pollinators (hence contributing to the 'B-line' initiative);
- Installation of bird and/or bat boxes within boundary trees and/or within the elevations of houses adjacent to boundary features;
- Financial contribution to the conservation of marshy grassland habitats within Carmarthenshire (to offset any residual habitat losses as required).

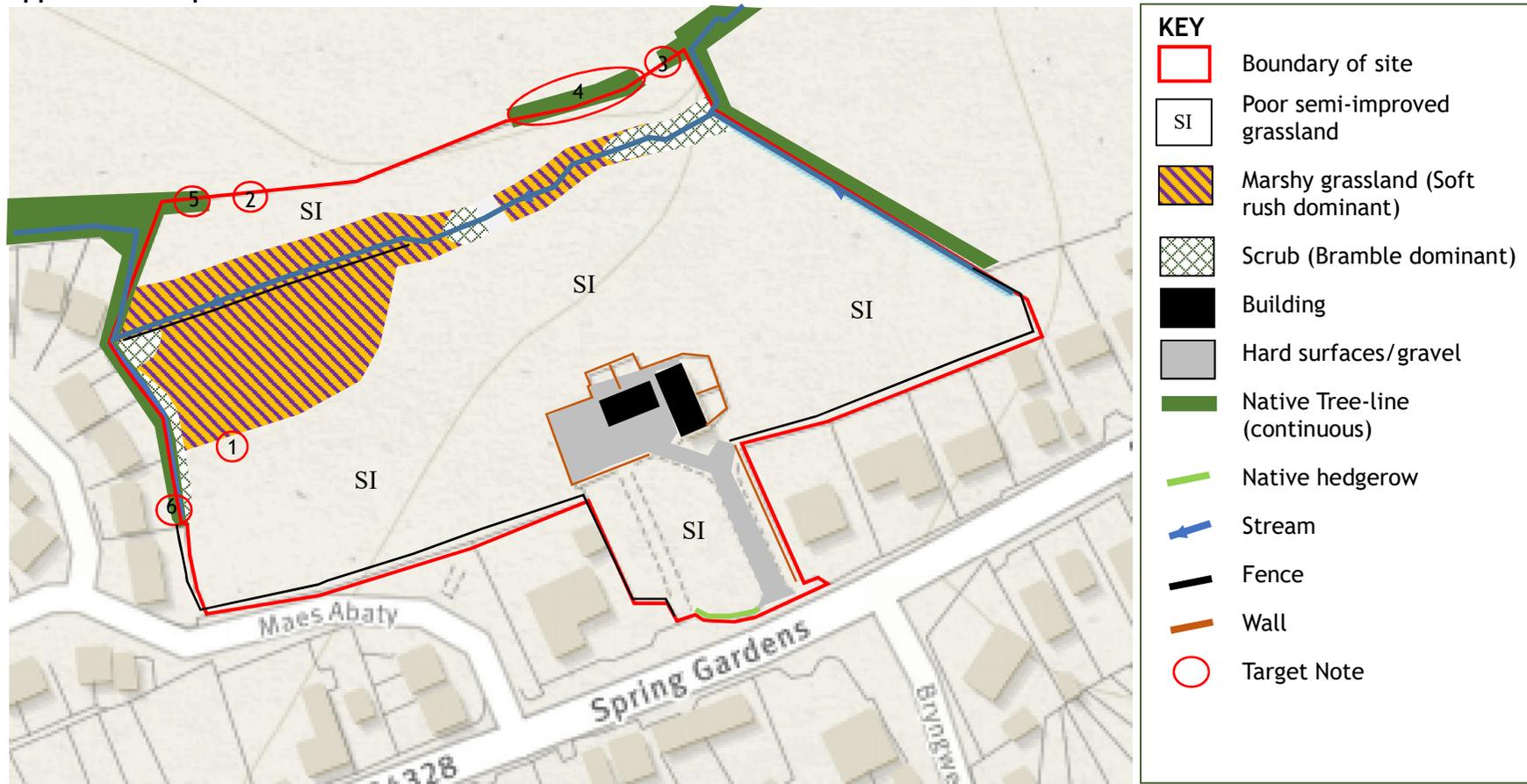
8 Conclusions

- 8.1 Provided that all of the measures outlined within Section 7 of this report are developed and fully implemented within the scheme, the potentially adverse ecological impacts could be avoided or suitably mitigated.

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<http://www.biodiversitywales.org.uk/>

Appendix A: Map of Habitats and Features



KEY	
	Boundary of site
	Poor semi-improved grassland
	Marshy grassland (Soft rush dominant)
	Scrub (Bramble dominant)
	Building
	Hard surfaces/gravel
	Native Tree-line (continuous)
	Native hedgerow
	Stream
	Fence
	Wall
	Target Note

TARGET NOTES
 1, 2 - Brash piles
 3, 4, 5, 6 - Tree(s) with potential bat roost features

Appendix B - Photographs

Image 1: Improved grassland habitat - looking west across site (note tree-lines, marshy grassland and buildings in background)



Image 2: Improved grassland at the south of the site, looking north-west



Image 3: Improved grassland - looking east across site



Image 4: Marshy grassland habitat



Image 5: Marshy grassland habitat and brush pile (looking west to site boundary)



Image 6: Stream corridor (to west of site)



Image 7: Stream corridor (to east of site)



Image 8: Line of beech trees (south-eastern site margin)- just outside boundary



Image 9: Tree-line and wet ditch on the eastern boundary (looking north)



Image 10: Row of mature oak trees on the northern boundary (TPO 2806)



Image 11: Tree-line on western boundary



Image 12: Road access and hedge on southern boundary



Image 13: View of road access on southern boundary



Image 14: Bramble scrub habitat



Image 15: Potential bat roost features in trees on northern boundary include holes at base (leading to larger cavity within tree), knot holes and woodpecker holes



Image 16: Potential bat roost features in trees on the western boundary



Image 17: Buildings



Image 18: Garden areas to rear of buildings



Image 19: Habitats between stream and northern site boundary (looking west)



Image 20: Habitats between stream and northern site boundary (looking east)



Appendix C: Plant Species Recorded and Frequency within each Habitat Type

NB. Frequency is recorded according to the DAFOR Scale (Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R). Where species occurrence is localized to one or more areas within the habitat type, but not widespread, the prefix (L) is used, for instance LA = locally abundant.

Species	Common Name	Abundance by habitat type (DAFOR Scale)				
		Poor Semi-Improved Grassland	Marshy Grassland	Stream Corridor	Tree Lines and Hedges	Disturbed Ground
Ash	<i>Fraxinus excelsior</i>				O	
Beech	<i>Fagus sylvatica</i>				O	
Bittersweet	<i>Solanum dulcemara</i>		R			
Bramble	<i>Rubus fruticosus</i>		R	O	F	
Broad-leaved willow-herb	<i>Epilobium montanum</i>				O	F
Brooklime	<i>Veronica beccabunga</i>			LA		
Cock's Foot	<i>Dactylis glomerata</i>	F	O			
Common marsh bedstraw	<i>Galium palustre</i>		F			
Common sorrel	<i>Rumex acetosa</i>	O				
Cow Parsley	<i>Anthriscus sylvestris</i>					
Creeping buttercup	<i>Ranunculus repens</i>		O		O	
Dandelion	<i>Taraxacum officinale</i>	F				O
Docks	<i>Rumex sp.</i>	F	O			O
Dog rose	<i>Rosa canina</i>		R		O	
Elder	<i>Sambucus nigra</i>				R	
Fleabane	<i>Pulicaria dysenteria</i>					O
Fool's Watercress	<i>Apium nodiflorum</i>			LA		
Greater bird's foot trefoil	<i>Lotus pedunculatus</i>		F	F		
Greater plantain	<i>Plantago major</i>	O	O			O
Grey willow	<i>Salix cinerea</i>		R(Saplings)	O (Saplings)	F	
Groundsel	<i>Senecio vulgaris</i>					LF
Hawthorn	<i>Crataegus monogyna</i>				F	
Hazel	<i>Corylus avellana</i>				F	
Hedge Cranesbill	<i>Geranium pyrenaicum</i>				F	
Hemlock water dropwort	<i>Oenanthe crocata</i>				F	

Species	Common Name	Abundance by habitat type (DAFOR scale)				
		Improved Grassland	Marshy Grassland	Stream Corridor	Tree Lines and Hedges	Disturbed Ground
Honeysuckle	<i>Lonicera perclymenum</i>				R	
Ivy	<i>Hedera helix</i>				A	
Marsh thistle	<i>Cirsium pratense</i>		O	LA		
Marsh willowherb	<i>Epilobium palustre</i>		O	LF	LF	
Meadow buttercup	<i>Ranunculus acris</i>		O	R		
Meadowsweet	<i>Filipendula ulmaria</i>		F	LF		
Perennial Rye Grass	<i>Lolium perenne</i>	O				
Pedunculate Oak	<i>Quercus petrea</i>				F	
Ragwort	<i>Jacobaea vulgaris</i>	O				O
Red campion	<i>Silene dioica</i>				F	
Red Clover	<i>Trifolium repens</i>	O				
Ribwort plantain	<i>Plantago lanceolata</i>	F	O			O
Sharp flowered rush	<i>Juncus acutiflorus</i>		O			
Silverweed	<i>Argentina anserina</i>	LF	LF	LF		
Smooth sow thistle	<i>Sonchus oleraceus</i>					LF
Soft rush	<i>Juncus effusus</i>	LA	D	F		
Spear thistle	<i>Cirsium vulgare</i>	O			O	
Stinging nettle	<i>Urtica dioica</i>				F	
Sycamore	<i>Acer pseudoplatanus</i>				O	
Wavy bittercress	<i>Cardamine flexuosa</i>					O
White clover	<i>Trifolium repens</i>	F				
Wild Angelica	<i>Angelica sylvestris</i>		A	F		
Yorkshire Fog	<i>Holcus lanata</i>	D	F			

Appendix D: Habitat Creation - Recommended Species

Small - Medium sized Tree and Shrubs for Hedgerow or Habitat Plots

- Hawthorn (*Crataegus monogyna*)
- Blackthorn (*Prunus spinosa*)
- Willow (e.g. *Salix cinerea*)
- Rowan (*Sorbus aucuparia*)
- Holly (*Ilex aquifolia*)

- Hazel (*Corylus avellana*)
- Dogwood (*Cornus sanguinea*)
- Guelder rose (*Viburnum opulus*)
- Elder (*Sambucus nigra*),
- Crab apple / eating apple (*Malus spp.*)
- Buckthorn (*Rhamnus cathartica*)
- Juneberry (*Amelanchier Canadensis/ laevis*)
- Plum / Damson / (*Prunus spp.*)

Climbers

- Dog rose (*Rosa canina*)
- Field rose (*Rosa arvensis*)
- Wild honeysuckle (*Lonicera periclymenum*)
- Wild clematis (*Clematis vitalba*)

Perennial or self-seeding herbs for Habitat Plots

- Yarrow (*Achillea millefolium*)
- Michaelmas daisy (*Aster novi-belgii*)
- Ox-eye daisy (*Leucanthemum vulgare*)
- St John's wort (*Hypericum perforata*)
- Chives (*Allium schoenoprasum*)
- Foxglove (*Digitalis purpurea*)
- Lavender (*Lavandula officinalis*)
- Rosemary (*Rosemarinus officinalis*)
- Marigold (*Calendula officinalis*)
- Marjoram / Oregano (*Oreganum spp.*)
- Honesty (*Launaria annua*)
- Thyme (*Thymus spp.*)
- Borage (*Borago officinalis*)
- Vervain / Verbena species
- Welsh poppy (*Meconopsis cambrica*)
- Mints (*Mentha spp.*)
- Lungwort (*Pulmonaria officinalis*)
- Orpine *Sedum telephium*
- Comfrey *Symphytum officinale*
- *Echinacea purpurea*
- Snowdrop *Galanthus spp.*,
- Native bluebell *Hyacinthoides non-scriptus*
- Autumn & Spring flowering Crocus