



**Land North of Llewellyn Road,
Penllergaer**

Ecological Impact Assessment Report

April 2021

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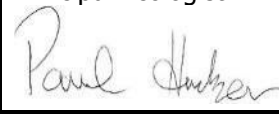
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Document Verification Table

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Revision	Date	Prepared by	Checked by	Verified by
2.1	15 April 2021	Jenny Smith Graduate Ecologist 	Alastair Krzyzosiak Ecologist 	Paul Hudson MCIEEM Principal Ecologist 

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Summary

Brief and Site Location	<p>Acer Ecology Ltd was commissioned by Barratt Homes to conduct an ecological assessment of land north of Llewellyn Road, located at Penllergaer, SA4 9BA, within the boundary of Swansea City and County Council (Ordnance Survey Grid Reference centred at: SS 61031 99040).</p>
Development Proposals	<p>Development proposals involve clearance of the site to facilitate residential development, including the construction of 180 new residential dwellings of both private market and affordable housing; establishment of formal and informal open space, green space and structural landscaping; new and improved highway infrastructure through Mount Crescent; and draining attenuation and infrastructure. The hedgerows surrounding the boundary of the site are predicted to be kept, however, sections of the central hedgerow splitting the two fields will be fragmented by the development proposals.</p>
Statutory and Non-Statutory Nature Designations	<p>No statutory or non-statutory designated sites are anticipated to be affected by the works.</p>
Impacts on Habitats of Value	<p>The species-rich hedgerows in the eastern most field (Field 1) (H1, H3 and H4), and hedgerows with trees that border westernmost field (Field 2) and the southern boundary of Field 1, will be retained. The central hedgerow with trees (H5) that divides Fields 1 and 2, will be breached in places. Consequentially, ecological connectivity between the north and south of the site is anticipated to be reduced. Recommendations to avoid and mitigate impacts are presented in Section 5 of this report.</p> <p>No other Section 7 (Environment Wales Act, 2016), LBAP or SINC habitats will be impacted by the proposed works.</p>
Impacts on Protected and Notable Species	<p>The proposed development could potentially have adverse impacts of varying degrees on a range of legally protected species, including common reptiles, nesting birds, badgers, hedgehogs, and foraging, commuting and roosting bats.</p> <p>It is considered necessary, therefore, that appropriate mitigation measures are set in place to avoid or minimise impacts to these species (see Section 5).</p> <p>Further surveys are in progress to establish presence/likely absence of dormice and reptiles and bat activity.</p>
Invasive Non-native Species	<p>None recorded.</p>
Ongoing Survey	<p>The following additional surveys are required:</p> <ul style="list-style-type: none"> • Reptile surveys are in progress in the grassland-hedgerow interfaces across the whole site and are being carried out between April and September – ideally in April, May, June or September. • Dormouse surveys: Nest tubes will be positioned across the site's hedgerows at 10-20m intervals, as well as on adjoining suitable habitat. These will be monitored over the course of the survey season (April-August/September). If 100 dormouse tubes are installed the survey will need to continue until August to be sufficiently robust, or until September if 50 dormouse tubes are installed on site. • Bat transect and static detector surveys: The habitats on the site are assessed as having 'moderate suitability for bats'. This assessment would normally dictate that surveys are undertaken once a month between April and October in appropriate weather conditions for bats. However,

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	<p>surveys have been undertaken in the summer and autumn months, and if coupled with a spring survey and a sensitive lighting scheme further surveys may not be necessary;</p> <ul style="list-style-type: none"> • Update ground level bat assessment of trees proposed for removal; and • Bat surveys (i.e. dusk emergence and dawn re-entry surveys) prior to any works to trees with moderate or high bat roosting potential. Currently it is assumed that no work is proposed on these trees.
Licensing Requirements	Protected species licences may be required upon completion of further surveys.
Recommendations	<p>The following provisional recommendations have been developed based on the development proposals available at the time of writing:</p> <ul style="list-style-type: none"> • Further surveys for reptiles, dormouse and bats. These are currently in progress; • Retaining the habitats type on the site; • Precautionary measures, including hedgerow and tree protection, appropriate timing of vegetation clearance, species sensitive construction practices; noise control and pollution prevention measures. • Sensitive lighting strategy for bats and dormice; and • Compensatory and enhancement measures, including appropriate landscaping and provisions of bird boxes. <p>It should be noted that they may be subject to change upon receipt of the final design and on completion of further surveys outlined in Section 5.</p>

1. Introduction

1.1. Brief

Acer Ecology Ltd was commissioned by Barratt Homes to conduct an ecological assessment of land north of Llewellyn Road, located at Penllergaer, SA4 9BA, within the boundary of Swansea City and County Council (Ordnance Survey Grid Reference centred at: SS 61031 99040¹). The purpose of the assessment was to document the baseline ecological condition of two fields as illustrated by the red line boundary shown in Plan 1. This included identification of any designated sites or habitats that could be affected by the proposed works, and identification of or potential for, protected and/or otherwise notable species of conservation interest that could be affected. Potential ecological constraints were identified, and subsequent recommendations developed.

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

1.2. Site Description

The site proposed for development comprises two fields managed as pasture, and are committed within Swansea County Council's adopted Local Development Plan for residential development. The combined area of both fields measures approximately 6.1ha and comprises improved grassland and hedgerow boundaries surrounding each field.

The site is situated in Penllergaer and lies immediately to the north of an urban area of residential housing. Immediately to the north and west of the site lies pastoral fields surrounded by hedgerows. The Manse Luxury Holiday Home lies immediately to the west of the site too. Approximately 0.3km to the east of the site lies an urban area of Penllergaer.

An expanse of pastoral and arable fields lies to the north and west of the site and the M4 motorway is approximately 0.4km to the north-east of the fields. The towns of Gorseinon and Penyrheol lie approximately 1.3km to the east of the site.

1.3. Proposed Works

Development proposals involve clearance of the site to facilitate residential development of 180 new residential dwellings; establishment of formal and informal open space, green infrastructure and structural landscaping; new and improved highway infrastructure through Mount Crescent; and draining attenuation and infrastructure. The hedgerows surrounding the boundary of the site are predicted to be kept, however, sections of the central hedgerow will be fragmented by the development proposals. Proposed plans can be found in Appendix 1: Development Proposals.

¹ Latitude and Longitude: 51.672894, -4.0111098

1.4. Scope of the Study

The study comprised the following:

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

1.5. Reporting

This report aims to:

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

2. Methods

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

2.1. Desk Study

2.1.1. Protected Sites, Habitats and Species

Information on designated sites (Table 1) and protected species was obtained from the following sources. The legislation and policy relating to statutory and non-statutory designated sites can be found in Appendix 2. Plans 2 - 5 show the protected sites in relation to the proposed development site.

Table 1: Summary of Designated Sites and Other Abbreviations

Abbreviations	
Special Areas of Conservation	SAC
Special Protected Area	SPA
Site of Special Scientific Interest	SSSI
National Nature Reserve	NNR
Local Nature Reserve	LNR
Site of Importance for Nature Conservation	SINC
Ancient Semi-Natural Woodland	ASNW
Restored Ancient Woodland Site	RAWS
Plantation on Ancient Woodland Site	PAWS
South East Wales Biological Records Centre	SEWBRcC
Natural Resources Wales	NRW

Table 2: Sources of Data

Source	Data	Radius of Search
NRW Geographical Information Systems (GIS) Layers	Statutory and non-statutory nature conservation designated sites	Ramsar/SACs/SPAs/SSSIs/NNRs)/LNRs – 2km ² . SACs (designated for bats) - 10km.
	ASNW, RAWS and PAWS	2km.
SEWBRcC	Protected species records (SEWBRcC Ref No. 0201-458)	1km.
	SINCS	1km.

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

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

2.1.2. Landscape Context

The site and wider landscape were assessed and characterised using aerial images, Ordnance Survey maps and SEWBRc Phase 1 Habitat maps dating from the 1990s. The presence of off-site features and habitats, which add to the ecological value within the wider area (for example, ponds within 0.5km of the site) were identified. Where appropriate, such features were scoped into the detailed assessment of impacts presented in Section 4 below.

2.1.3. Ancient Woodland

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

2.1.4. Planning Authority

The Swansea City and Council Planning Portal³ was consulted to determine if any previous survey information was available for the site, or immediate surroundings.

An internet-based search of the Swansea Local Biodiversity Action Plan (LBAP)⁴ was undertaken.

Numerous attempts were made to engage in pre-application discussions with the county ecologist about the survey effort required. Unfortunately, no response was received.

2.2. Field Study

2.2.1. Personnel

The field survey was undertaken in good weather on the 14th October 2020 by Jenny Smith⁵. The bat survey work was undertaken by Paul Hudson MCIEEM⁶.

2.2.2. Vegetation and Habitats

The vegetation and habitat types present within the survey area were categorised and mapped in accordance with the standard⁷ Phase 1 Habitat assessment methodology (Joint Nature Conservation Committee, 2010), dominant and conspicuous plant species were recorded for each habitat. Target notes (TN) were used to record information on features of ecological interest, such as evidence of, or habitats with potential to support protected species. Following the completion of the survey, a colour-coded habitat plan was digitised using QGIS to show the extent and distribution of the different habitat types present within the site (see Plan 6).

³ <http://www.swansea.gov.uk/planningsearch>

⁴ <http://www.swansea.gov.uk/article/10113/Swansea-Local-Biodiversity-Action-Plan>

⁵ Jenny graduated from Cardiff University with a First-Class degree in Biological Sciences in 2020, during which she studied modules on biodiversity, ecology and conservation. She is in her first season of working as a Graduate Ecologist and is undergoing training with Acer Ecology in Phase 1 Habitat surveys.

⁶ Paul graduated with a degree in Environmental Biology from Reading University and a Postgraduate Diploma in Conservation Management from the University of East Anglia. He has worked within ecological consultancy since 2000 and has been involved in bat work since 2001. He holds licences to disturb bats in both Wales (S088190/1 valid until June 2022) and England (2018-36707-CLS-CLS valid until 2028). Further details of his qualifications and experience can be found at <http://linkd.in/19aGTf4>.

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

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

The presence of invasive plant species listed on Schedule 9⁸ of the Wildlife and Countryside Act 1981 (as amended), such as Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*) and Japanese knotweed (*Fallopia japonica*) were also noted during the survey, if present.

2.2.3. Protected and Notable Species

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

- Listed under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species and Planning (various amendments) (England and Wales) Regulations 2018, until and unless superseded by The Conservation of Habitats and Species (Amendment) (EU Exit) [‘CHSAEU’] Regulations 2019;
- Listed under Section 7 of the Environment (Wales) Act 2016 as being of principal importance for maintaining and enhancing biodiversity in Wales;
- Listed as a local priority for conservation, for example in the Swansea Local Biodiversity Action Plan (LBAP);
- Red Listed using International Union for the Conservation of Nature (IUCN) criteria (e.g. in one of the UK Species Status Project⁹ reviews, in the Species of Conservation Concern Red, Amber or Near Threatened List¹⁰, Birds of Conservation Concern in Wales¹¹, or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
- Listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a Nationally Notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/or
- Endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

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

Birds

Any birds observed during the field survey were recorded, in addition to features capable of supporting nesting birds (e.g. trees, hedgerows, buildings, bramble, ruderal vegetation and rough grassland etc.). The

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

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

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

¹¹ Johnstone, I. and Bladwell, S. (2016) Birds of Conservation Concern in Wales 3: the population status of birds in Wales. *Birds in Wales* 13 (1).

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site was also assessed for its actual and potential suitability to support Wildlife and Countryside Act 1981 (as amended) Schedule 1 species.

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

Bats

Preliminary Ground-level Roost Assessment

A preliminary ground-level roost assessment of the trees within the survey area was undertaken looking for features that bats could use for roosting (Potential Roost Features¹² (PRF) and evidence of bats (i.e. droppings in, around or below a PRF; odour emanating from a PRF; audible squeaking at dusk or during warm weather; or staining below the PRF). A systematic inspection was carried out around all accessible aspects of the tree, from both close to the trunk and further away. The location of the trees is shown on Plan 6.

The trees were assessed for their suitability to support roosting and hibernating bats in accordance with Table 4.1 of the Bat Conservation Trusts Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) (see Appendix 3). Binoculars were used as appropriate during the survey.

Buildings Assessment

There are no buildings present within the survey area therefore a building assessment was not carried out.

Terrestrial Habitat Assessment

A preliminary assessment of the value of the site for bats (and any potential roost sites therein) was made in accordance with Table 4.1 of the Bat Surveys for Professional Ecologists (Collins, 2016). The assessment was based on the relative abundance and quality of habitat features within the site, and surrounding landscape, suitable for roosting, foraging and commuting bats.

Transect Surveys

Two separate bat activity transect surveys were undertaken: on 27th August 2020 and on the 25 October 2020 by Paul Hudson MCIEEM on both occasions.

The surveys commenced at sunset and continued until 120 minutes after sunset. In accordance with best practice guidance, the transect surveys were undertaken during nights with a minimum sunset temperature above 10°C.

The transects were walked at a slow pace along a set route as shown on Plans 1 and 2. Five-minute sample periods were undertaken at monitoring points and all bat species encountered were recorded. General bat activity was recorded whilst walking between each monitoring point. The bat detectors were set using the

¹² Potential Roost Features that bats may use identified by Andrews include: woodpecker-holes; squirrel-holes; knot-holes; pruning-cuts; tear-outs; wounds; cankers; compression-forks; butt-rots; lightning strikes; hazard-beams; subsidence-cracks; shearing cracks; transverse cracks; welds; lifting bark; frost-cracks; fluting and ivy.

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PARS editor software so that the longest recording was twenty seconds. A bat being recorded continuously for 21 seconds would register as two different recordings.

In addition, two Anabat Express static detectors were deployed in the locations shown on Plan 6C. The detectors were set to record for a period of 5 nights from 27th August until 1st September and from 26th October to 31st October. Bat activity between dusk and dawn was recorded. Analysis of the bat survey data was made using the Anlook analysis software to determine the number of bat passes recorded¹³. The detectors were positioned in the hedgerow and scrub habitats of the site, where it was anticipated that bat activity would be concentrated.

Two static detectors were deployed on both occasions.

Dormice

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

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

Great Crested Newts

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

Ordnance Survey maps and aerial images of the land surrounding the site were consulted to determine if any water bodies were present within the site or within 0.5km of it.

There do not appear to be any suitable water bodies present within 0.5km of the site, however, the study area is immediately north of an expanse of residential dwellings, therefore, garden ponds could be present. If present, these were not assessed.

Badgers

Earth embankments, wooded copses, hedgerows and dense bramble beds are habitat features that often contain evidence of badger (*Meles meles*). Where present on-site these and other suitable habitat features

¹³ A bat pass is defined as a single sound file containing a species' echolocation call. Where multiple species are recorded on the sound file, the calls by each species was tallied.

were searched for such evidence. Where present, the location of badger signs such as setts, runs, dung pits or latrines, prints, hair and foraging snuffle holes were recorded.

Reptiles

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

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

Marsh Fritillary & Small Pearl-Bordered Fritillary

The survey included a search for the larval food plant of the marsh fritillary butterfly (*Euphydryas aurinia*), devil's bit scabious (*Succisa pratensis*).

Other Species

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

2.2.4. Assessment of Ecological Value

The value of the habitats and features of the site have been provisionally evaluated and graded in accordance with a geographical frame of reference as detailed in Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2018). The level of value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, district, local and, lastly, within the immediate zone of influence of the site only. Brief descriptions of how Acer Ecology interprets these categories are set out in Appendix 4.

2.2.5. Constraints and Limitations

General Temporal Constraints

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

Seasonality of Survey

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The present survey was undertaken outside of the optimal survey period for certain species of flora and fauna, with many species having died back or having become inconspicuous at the time of the survey. The survey can be considered as providing a reasonable, though not exhaustive or full, plant list. The survey noted the habitat types present on site and the dominant vegetation at the time of the survey, which is likely to be constant and a fair reflection of the habitat quality present.

Incomplete Survey Information

Full surveys for the protected species listed previously have not yet been carried out. For some species of fauna for which evidence has been found or which are considered likely to occur on site, further targeted survey is advisable at a more appropriate time of year (see Section 5).

3. Results

3.1. Desk Study

3.1.1. Statutory Nature Conservation Designated Sites

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

The proposed development site lies within 10km of two SSSIs that have been specifically designated for bats:

- Parkmill Woodlands and Llethrid Valley SSSI lies approximately 10km to the south-west of the study area. Several of the caves within the woodlands are known hibernation sites for greater and lesser horseshoe (*Rhinolophus hipposideros*) bats. The hibernation sites are also used by whiskered (*Myotis mystacinus*) and natterer's (*Myotis nattereri*) bats; and
- Rose Cottage SSSI lies at the head of an extensive wooded valley and comprises an important maternity roost for lesser horseshoe bats. It lies approximately 10km to the south-west of the survey site.

SACs within 2km of Site

There are no SACs designated for their conservation value within a 2km search radius of the site.

SSSIs within 2km of Site

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

- Penllergaer Railway Cutting SSSI measures approximately 3.49ha and is located approximately 1km to the north-east of the study area. This SSSI is designated for geological features, however, notable habitats and species are not included in the citation. The SSSI lies within broadleaf woodland however, and therefore, the site could have high ecological value for numerous species of conservation concern, including bats, birds and mammals;
- The Nant Y Crimp SSSI measures approximately 65.49 ha and is located approximately 1.5km to the north-east of the study area. This site was Site designated for its wet pastures, species-rich neutral grasslands and semi-natural woodland including wet woodland, now a scarce habitat in south Wales, along with associated scrub, which are host to a number of notable plant species including petty whin (*Genista anglica*), narrow buckler fern (*Dryopteris carthusiana*) and whorled caraway (*Carum verticillatum*). In addition, a colony of marsh fritillary (*Euphydryas aurinia*) butterfly is present on the site, which is a declining species confined in South Wales mainly to unimproved wet pastures where its food plant devil's-bit scabious (*Succisa pratensis*) grows in abundance; and

- The Penplas Grasslands SSSI which measures approximately 29.49 ha, is located approximately 2km to the south-east of the study area. The site comprises a series of low-lying pastures which have largely been managed using traditional farming methods and represent one of the largest and most diverse examples of agriculturally unimproved land within the lowland part of West Glamorgan. Such grasslands were once commonplace in Wales but lowland sites are now becoming scarce. Eight different grassland types have been identified on the site, including three types of rhos (purple moor-grass) pasture, two of rush pasture, fen meadow, acid grassland and damp heath. Notable plant species recorded at Penplas include whorled caraway, petty whin and royal fern (*Osmunda regalis*)¹⁴.

3.1.2. Non-statutory Nature Conservation Designated Sites

SINCs

Six SINCs were recorded within 1km of the study area (see Plan 4). These were:

- Llys nini SINC is located approximately 139m to the north of the development. The SINC is designated as it supports comprises grassland, wet grassland, improved and unimproved grassland, deciduous ancient woodland, streams, ponds, scrub on a former industrial tip, reclaimed opencast mine and coppiced woodland;
- Mynydd Garn Goch SINC is located approximately 0.3km to the south of the development. The SINC is designated as it supports *Molinia* grassland, marshy grassland, scrub, bracken, neutral grassland, acid grassland, lichen/bryophyte heath and ponds;
- The M4 corridor SINC is located approximately 0.4km to the east of the site. No designation information was provided, however, a lot of broadleaf woodland can be seen using aerial imagery, which could act as important ecological corridors for various species including foraging and commuting bats, nesting birds and various mammals;
- The Upper Mynydd Garn Goch SINC is located approximately 0.5km to the west of the development site. No designation information was provided, however, a lot of grassland and hedgerow and broadleaf woodland can be seen using aerial imagery, which could act as important ecological corridors for various species including foraging and commuting bats, nesting birds, reptiles, invertebrates and various mammals. Additionally, the single record of marsh fritillary within 1km of the development site was found within this SINC, and as a consequence, populations of devil's bit scabious are likely to be present, which is an indicator species of neutral grassland;
- The "Lougher to the Penllergaer Railway Line" SINC is approximately 0.7km to the north-east of the site. No designation information was provided, however, a lot of broadleaf woodland and some possible grassland habitat can be seen using aerial imagery, which could act as

¹⁴ https://naturalresources.wales/media/649359/SSSI_0688_Citation_EN001896b.pdf

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important ecological corridors for various species including foraging and commuting bats, nesting birds, reptiles, invertebrates and various mammals; and

- Penllergaer Valley Wood SINC lies approximately 0.8km to the east of the development site. The site was historically a Victorian estate that is now designated for its various wildflowers and bird species. Additionally, the site includes expanses of broadleaf woodland, various waterbodies including the Afon Llan river which intercepts the site, and a lake with an area of approximately 0.9ha.

None of these sites are within or lie adjacent to the site.

Ancient Woodland

There are over 30 areas of ASNW located within 2km of the study site, the nearest of which lies 0.7km to the north-east of the site. In addition, 18 Planted Areas on Ancient Woodland Sites (PAWS), 23 Restored Ancient Woodland Site (RAWS) and six Ancient Woodland Sites of Unknown Category are present within the same search radius.

None of these woodlands are anticipated to be affected by the proposed works. They are therefore not mentioned further in this report.

3.1.3. Site History

Phase 1 Habitat Maps

A Phase 1 habitat survey map of the site was provided by SEWBReC which is based upon surveys undertaken by the former Nature Conservancy Council (NCC) during the period 1992-96 and NRW Remote sensing data gathered during 2003 until 2006. This recorded "poor-semi improved grassland (B6)" in the north-eastern corner of the site where a mast currently stands, and intact hedgerows (J2.1) surrounding the site and running through the centre of the site.

Reporting

A previous relevant report exists for the site, namely the "Environmental Statements Volumes 1-3: Non-Technical Summary" (2014) written by Boyer Planning. This statement reports:

- "Neutral" long-term ecological impacts of the development;
- Mitigation methods for reptiles recommended by RSK Carter Ecological Ltd. (October 2010), involving reptile deterrence methods, hedgerow removal using hand-tools only, destructive searches of hedgerow bases by a qualified ecologist, timing of works, toolbox talks);
- Results of the "Penllergaer Bat Activity and Ground Level Tree Surveys Report" conducted by RSK Carter Ecological Ltd. in October of 2010, which categorised nine on-site trees as having roost potential, and recorded "low activity" of commuting and foraging bats, and the recommendation of dark corridors, erection of bat boxes on new dwellings on the edge of the development;

- Results of the “Coedwig-Hywel Ground Level Tree and Initial Bat Survey Report” (RSK Carter Ecological Ltd., October 2010) which recommended further dawn and dusk surveys on farmyard buildings immediately south of the site should they become impacted by development.; and
- Results of the “Penllergaer Breeding and Passage Bird Survey Report” (RSK Carter Ecological Ltd., July 2010), which recorded 14 bird species on site, with between 10 and 15 breeding pairs in the hedgerows and none ground-nesting within the grassland.

3.2. Field Survey

3.2.1. Habitats and Vegetation

The results of the general survey of habitats and vegetation are shown on Plan 4. A botanical species list is provided in Appendix 5.

3.2.2. Summary of Habitats Present within the Site

The site consists of nine elements which are described in detail below. These comprise:

- Improved Grassland (B4);
- Semi-improved Neutral Grassland -Rush-dominated Grassland (B2.2)
- Tall Ruderal Vegetation (C3.1);
- Running Water (G.2);
- Intact Species-rich Hedgerow (J2.1.1);
- Defunct Species-poor Hedgerow (J.2.2.2);
- Species-poor Hedgerow with Trees (J.2.3.2);
- Fence (J3.4); and
- Bare Ground (J.4).

3.3. Habitat Descriptions

The DAFOS scale has been used when categorising species abundance (D = Dominant; A = Abundant, F = Frequent, O = Occasional, S = Scarce).

In the descriptions below “Field 1” refers to the easternmost field whilst “Field 2” is the westernmost field.

3.3.1. Improved Grassland (B4)

The improved grassland in Fields 1 and 2 maintained a sward height of approximately 10-15cm and had been recently grazed by cattle. In the south-eastern corner of Field 1 lies two tractor trailers next to the gateway (Photo 1). The majority of the grassland supports perennial rye grass (*Lolium perenne*) (D), annual meadow-grass (*Poa annua*) (F), rough meadow-grass (*Poa trivialis*) (F), Yorkshire fog (*Holcus lanatus*) (F), cock’s foot (*Dactylis glomerata*) (F), soft rush (*Juncus effusus*) (F), meadow fescue (*Schedonorus pratensis*) (*Festuca pratensis*) (F), creeping bent (*Agrostis stolonifera*) (F), meadow foxtail (*Alopecurus pratensis*) (O) and Timothy grass (*Phleum pratense*) (O). Herbaceous species found within the grassland include white clover (*Trifolium repens*) (A), red clover (*Trifolium pratense*) (A), creeping buttercup

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(*Ranunculus repens*) (F), daisy (*Bellis perennis*) (O), meadow buttercup (*Ranunculus acris*) (O), dandelion (*Taraxacum officinale agg.*) (O), common mouse-ear (*Cerastium fontanum*) (O), ribwort plantain (*Plantago lanceolata*) (O), greater plantain (*Plantago major*) (O), self-heal (*Prunella vulgaris*) (S) and broad-leaved dock (*Rumex obtusifolius*) (S).

The grassland surrounding the bails in the south-eastern corner of Field 1 (TN01; Photo 2) is slightly more species diverse within the fence, including barren brome (*Anisantha sterilis*) (O), *Carex* species (O), tufted vetch (*Vicia cracca*) (O), creeping thistle (*Cirsium arvense*) (O), common fleabane (*Pulicaria dysenterica*) (O) and broad-leaved willowherb (*Epilobium montanum*) (O).

Marsh cudweed (*Gnaphalium uliginosum*) (S) and cuckooflower (*Cardamine pratensis*) (S) are also present in the grassland along the eastern boundary of Field 1.

The southern boundaries and centres of each field were particularly wet, with small puddles of standing water. Additionally, the north-east corner of Field 1 (Photo 3) also has areas of standing water.

Photo 1: Trailers in South-East Corner of Field 1



Photo 2: Bails and Fence in South-Eastern corner of Field 1



Photo 3: North-Eastern Corner of Field 1 and H1



3.3.2. Semi-improved Neutral Grassland – Soft Rush Dominant (B2.2)

Within approximately the centre and southern boundaries of both Field 1 and Field 2 (Photos 4-7) lies particularly wet soils which are dominated by soft rush.

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Yorkshire fog (*Holcus lanatus*) and creeping bent (*Agrostis stolonifera*) are the most frequent grasses. Broadleaved herbs are relatively scarce, although creeping buttercup and meadow buttercup are both abundant, with smaller amounts of cuckooflower (*Cardamine pratensis*), white clover common sorrel (*Rumex acetosa*), ribwort plantain and common mouse-ear (*Cerastium fontanum*).

Towards the southern boundary of Field 2 sharp-flowered rush (*Juncus acutiflorus*) is also supported along with soft rush. Another area of rush-dominated grassland is present in Field 2 in the north-west corner where hedgerow H7 connects with H8.

Photo 4: View of Field 1 from North-western Corner as well as Rush-dominated Grassland



Photo 5: Rush-dominated Grassland in Centre, Facing South of Field 1, With Abundant Soft Rush



Photo 6: Rush-dominated Grassland in Centre of Field 1



Photo 7: Rush-dominated Grassland in Centre of Field 2



3.3.3. Tall Ruderal Vegetation (C3.1)

Along the southern boundary of Field 1, immediately north of the hedgerow (H6), lies a stretch of tall ruderal vegetation that is particularly dominated by common nettle (*Urtica dioica*), as well as supporting creeping thistle (O) and marsh thistle (*Cirsium palustre*) (O) (Photo 8).

Photo 8: Tall Ruderal Vegetation Along Southern Boundary of Field 1



3.3.4. Running Water (G.2)

Ditches flow along the northern (H7) and western (H8) boundary hedgerows of Field 2, the latter of which flows in a southerly direction (see Photo 9). Additionally, a ditch is present immediately to the south of the Field 1's southern boundary hedgerow (H6). In some areas, the water flows across rocky, pebbly substrate, whereas in other, the substrate appears to be very muddy. Aquatic vegetation was not present, however, it was difficult to access the ditches as hedgerows prevent access.

Various species were supported on the banks of the ditches, including hemlock water-dropwort (*Oenanthe crocata*) (A), redshank (*Persicaria maculosa*) (F), willowherb species (F), soft rush (O) and red fescue (*Festuca rubra*) (O).

Photo 9: Ditch Along H8 in Field 2, Flowing Southwards



3.3.5. Intact Species-Rich Hedgerow (J2.1.1)

The hedgerows below are numbers according to Plan 7.

The three hedgerows extending along the eastern boundary (H1, which extends approximately 120m, see Photo 3) and northern boundary (H3, which extends approximately 50m, and H4, which extends approximately 75m) of Field 1 are dense, species rich hedgerows (see Photos 10 and 11). The shrub layer of these hedgerows support common hawthorn (*Crataegus monogyna*) (D), bramble (*Rubus fruticosus*

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agg.) (D), holly (*Ilex aquifolium*) (F), dog-rose (*Rosa canina agg*) (F), field rose (*Rosa arvensis agg*) (O) and immature sycamore (O).

Additionally, H3 and H4 also supports blackthorn (*Prunus spinosa*) (O), honeysuckle (*Lonicera periclymenum*) (O), immature oak (*Quercus* spp.) (O) and yew (*Taxus baccata*) (R). H4 has one gap (TN04; Photo 12) within it but is broadly dense and intact otherwise.

The understories of both hedgerows similarly support ivy (*Hedera helix*) (A), common nettle (A), soft-rush (A), marsh thistle (F), creeping thistle (F), *Carex* species (F), rough meadow grass (F), bracken (*Pteridium aquilinum*) (O), common mouse-ear (O), hart's-tongue fern (*Asplenium scolopendrium*) and creeping cinquefoil (*Potentilla reptans*) (R).

Towards the north-east of the site there is dead grasses and soft rush at the base of H1 (see Photo 3).

Photo 10: H3 and H4 of Field 1



Photo 11: Gate between H3 and H4 in Field 1



Photo 12: Gap in H4 of Field 1



3.3.6. Defunct Species-Poor Hedgerow (J2.2.2)

A very thin hedge grows around the wooden fence that surrounds the mast located outside the north-east corner of the site (H2). This sparse hedgerow supports bramble (D) grey willow (*Salix cinerea*) (F), willowherb spp. (*Epilobium* sp.) (F), a very young pedunculate oak (*Quercus robur*; TN02) (R), a single common gorse (*Ulex europaeus*) shrub situated to the left of the fence line (Photo 14), Hart's-tongue fern (O), soft rush (F), thistle species (F) and rough meadow grass (F).

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Photo 13: Defunct Species-Poor Hedgerow H2 of Field 1



Photo 14: Bare Ground, Trough and Fence Between H2 and H3, and Gorse Shrub Behind



3.3.7. Species-Poor Hedgerow with Trees (J2.3.1)

The western (H5) and southern (H6) hedgerows of Field 1 and the northern (H7), western (H8) and southern (H9) hedgerows of Field 2 support the same species as H1, H3 and H4 (with the exception of yew). Descriptions of the trees within these hedgerows are found in section "3.5.3 Bats".

H5 is particularly thin with numerous gaps and is dominated by bramble and holly (see Photos 15 and 16). The gaps are particularly noticeable between the oak trees TN07 and TN08, but becomes denser further south of TN08. Immediately north of the oak tree TN09, there are numerous gaps and breaks in the hedge which continues to be sparse further south of the oak tree TN10.

H6 extends approximately 200m along the southern boundary of Field 1 (see Photo 17). This is also dominated by bramble and supports a frequent population of bracken in the understory. Immediately north of H6 lies a large amount of flattened soft rush, presumably from mechanical means. A gate is present in H6 near a large building with corrugated metal walls and roof, and a rusting metal frame is discarded in the hedgerow next to this gateway (see Photo 18).

The hedgerow lining the northern boundary of Field 2 (H7) is approximately 125m in length and contains numerous gaps around the oak trees TN12-TN15 (Photo 19), where bramble and holly dominates (see Photo 20). Unlike the hedgerows in Field 1 (H1 - H4), H7 supports beech (*Fagus sylvatica*) (O), field maple (*Acer campestre*) (O) and willow species (R) too. Hawthorn occurs frequently amongst dominant bramble around the oak tree TN16. Bramble becomes more dominant on the western side of the hedgerow (Photo 21).

H8 extends approximately 183m along the western boundary of Field 2 and is dominated by holly. Many young sycamore trees are also dominant in the northerly half of the hedge. Further south towards TN40 the hedgerow is dominated by holly, along with hazel (F) and oak (F). Along the majority of H8 lies dead and flattened bramble (see Photo 22), presumably from previous vegetation removal. The southern portion of H8 lies at the back of the gardens of The Manse Luxury Holiday Home (Photo 23). Photo 24 shows the extent of the majority of H8.

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The southern hedgerow of Field 2 (H9) extends for approximately 240m. This hedgerow is especially low (approximately 1.25m tall), thin and full of gaps, and is dominated by bramble. The ground surrounding H8 within the field is very wet (see Photo 25). In places, the bramble is tall, especially along the wooden fence the demarcates residential gardens (see Photo 26 and 27). Towards the centre of H9 the bramble hedgerow becomes very sparse and is overgrown in places by tall ruderal vegetation near the wooden fences of residential houses that lie immediately south of Field 2 (Photo 28).

Photo 15: Gaps in H5 between Field 1 and 2



Photo 16: Gaps in H5 North of Oak Tree TN10



Photo 17: H6 of Field 1 (Southern Boundary)



Photo 18: Gate within H6 of Field 1



Photo 19: Gaps in H7 of Field 2 Between Trees TN12-15



Photo 20: H7 and H8 of Field 2



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Photo 21: H7 and Rush-dominated Grassland in North-West Corner of Field 2



Photo 22: Dead Bramble Along H8 in Field 2



Photo 23: Trees Within H8 at the Rear of a Holiday Home (Field 2)



Photo 24: Trees within H8 of Field 2



Photo 25: Western Portion of H9 and Wet Ground (Field 2)



Photo 26: Bramble Dominant H9 Near Residential Gardens (Field 2)



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Photo 27: H9 of South of Field 2



Photo 28: H9 and Tall Ruderal Vegetation



3.3.8. Fence (J3.4)

A wooden fence surrounds the mast at the north-east corner of the site. Barbed wire fences line some of the hedgerows including H5 and H9. Along the wooden fence at the southern boundary of Field 2, lies some *Nasturtium* that have presumably escaped from the residential gardens on the other side of the fence.

Photo 29: *Nasturtium* Escapee in Field 2



3.3.9. Bare Ground (J.4)

The ground near gateways is particularly well-trodden by cattle and therefore devoid of vegetation (see Photos 11 and 14).

3.4. Off-site Habitats

Six oak trees and one silver birch tree lies outside of the site boundary in the north-west corner of Field 2 (Photo 30). Immediately north of the site lies more agricultural fields that appear to have similar vegetation communities.

Photo 30: Off-site Trees at North-West Corner of Field 2



3.5. Protected and Notable Species

3.5.1. Notable Plant Species

Data Trawl Results

SEWBReC recorded protected plant species and species of principal importance listed under the Environment (Wales) Act 2016 from within 1km of the site proposed for development. None of the records provided, however, relate to the proposed development site.

Field Survey Results

No regionally uncommon plant species have been recorded from the site to date. No species from Swansea's LBAP or the UK BAP were recorded on site.

3.5.2. Birds

Desk Study Results

SEWBReC provided numerous records for birds within 1km of the site. The following table shows nesting birds associated with the habitats present on-site and their conservation status:

Table 3: Desk Study Records of Birds

Species		Schedule 1	Section 7 list – Environment Act Wales	UK BAP	Red list ¹⁵	Amber list ¹⁶
House martin	<i>Delichron urbica</i>					Yes
House sparrow	<i>Passer domesticus</i>		Yes	Yes	Yes	
Swallow	<i>Hirundo rustica</i>					

¹⁵ Bird species of high conservation concern, such as those whose population or range is rapidly declining, recently or historically, and those of global conservation concern.

¹⁶ Bird species of medium conservation concern, such as those whose population is in moderate decline, rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.

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Field Survey Results

A low number of birds were recorded on site during the field survey, including those listed in Table 4.

Table 4: Field Study Records of Birds

Species		Schedule 1 - Wildlife and Countryside Act 1981	Section 7 list – Environment Act Wales	UK BAP	Red list ¹⁷	Amber list ¹⁸
Blackbird	<i>Turdus merula</i>					
Blue tit	<i>Cyanistes caeruleus</i>					
Carrion Crow	<i>Corvus corone</i>					
Grey wagtail	<i>Motacilla cinerea</i>				yes	
Herring gull	<i>Larus argentatus</i>		Yes		Yes	
House sparrow	<i>Passer domesticus</i>		Yes	Yes	Yes	
Robin	<i>Erithacus rubecula</i>					
Skylark	<i>Alauda arvensis</i>		Yes	Yes	Yes	
Starling	<i>Sturnus vulgaris</i>		Yes	Yes	Yes	
Swallow	<i>Hirundo rustica</i>					
Woodpigeon	<i>Columba palumbus</i>					

A defunct nest was recorded in an oak tree (TN30), as shown in Photo 31.

Photo 31: Defunct Nest in Oak Tree (TN30)



3.5.3. Bats

Desk Study Results

No bat records were received from within the development site boundary, however, the data search returned two records of bat roosts within 1km of the site:

¹⁷ Bird species of high conservation concern, such as those whose population or range is rapidly declining, recently or historically, and those of global conservation concern.

¹⁸ Bird species of medium conservation concern, such as those whose population is in moderate decline, rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.

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- A *Pipistrellus* roost of 40 individuals located approximately 0.7km to the south-west of the site, recorded in 1993; and
- A common pipistrelle roost of at least two individuals located approximately 0.9km to the east of the site.

In addition to the roost records, SEWBReC returned many records of bats foraging or commuting within 1km of the site. These included unknown *Myotis* species, soprano pipistrelles, noctules, serotines and whiskered bats.

Field Survey Results

Trees

An assessment was made of the potential of the mature and semi-mature broadleaved trees within the survey area for use by roosting bats. They are described briefly in the table below, together with any evidence of bat occupation observed, and an assessment of their likely use by roosting bats. The trees are shown as target notes on Plan 6. No evidence of bats was detected in or around any of the trees. Photos of each tree is shown in Appendix 6. For detailed descriptions of the trees, see "Tree Survey at Llewellyn Road, Penllergaer, Swansea" that was carried out by Treescene Arboricultural Consultants on the 14th October, 2020.

All of the trees within the survey area were assessed for their suitability to support roosting bats. The majority of trees within the hedgerows were semi-mature and mature in age with various PRFs.

Table 5: Trees Assessed for Bat Potential

Target Note (TN) Number	Description	Potential Roosting Features	Bat Potential
Field 1			
2	Very young sessile oak	None	Negligible
5	Oak spp. Approximately 6-8m tall and a DBH of 76cm. Thin branches.	Dense ivy coverage	Low
6	Oak spp. Approximately 6-8m tall and a DBH of 100cm. Thin branches.	Dense ivy coverage near the trunk base.	Low
7	Oak spp. Approximately 6-8m tall. Thin branches.	Some ivy coverage and gaps in a broken branch.	Moderate
8	Oak spp. Approximately 6-8m tall. Thin branches.	Dense ivy coverage.	Low
9	Oak spp. Approximately 6-8m tall. Thin branches.	Dense ivy coverage.	Low
10	Young oak spp. Approximately 5m tall and a DBH of 50cm. Located in a gappy hedge. Very thin, exposed branches.	Some ivy coverage on thin branches.	Negligible

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11	Coppiced hazel scrub approximately 4-5m tall with numerous thin branches. Next to a hawthorn tree approximately 4m tall with thin branches. Possible badger hole in hedge below.	None	Negligible
Field 2			
12	Semi-mature oak spp. Approximately 6-8m tall. Thin branches and no ivy coverage. Located in a gappy hedge.	None observed	Low
13	Oak spp. Young. Approximately 5m tall with DBH of 100cm. Thin branches and no ivy coverage. Located in a gappy hedge. Small young ash tree growing next to it.	None observed.	Negligible
14	Oak spp. Young. Approximately 4m tall with DBH of 70cm. Thin branches and holly at base. Located in a gappy hedge.	Woodpecker-like hole in main trunk.	Low
15	Oak spp. Young. Approximately 4m tall with DBH of 70cm. Thin branches and holly and bramble at base. Located in a gappy hedge.	None	Negligible
16	Mature oak spp. Approximately 8-10m tall with DBH of 150cm. Located in a gappy hedge.	Many snapped branches with various gaps. Ivy covering main trunk.	Moderate
17	Young oak spp. Approximately 6m tall with a DBH of 76cm.	Sparse ivy coverage with a broken branch offering gaps.	Low
18	Young oak spp. Approximately 6m tall with a DBH of 76cm. Located in the field immediately north of Field 2.	Gnarled branched with some gaps.	Low
19	Very young oak spp. Approximately 5m tall and a DBH of 40-50cm. Located in a gappy hedge. Two very thin branches coming off main trunk.	A lot of ivy coverage.	Negligible
20	Very young oak spp. Approximately 5m tall and a DBH of 40-50cm. Located in a gappy hedge. Very thin branches coming off main trunk.	A lot of ivy coverage	Negligible
21	Young oak spp. Approximately 5m tall and a DBH of 70cm. Located in a gappy hedge. Thin branches.	Dense ivy coverage creeping up majority of the tree.	Low
22	Semi-mature oak spp. Approximately 7m tall. Many bare branches with little foliage. Surrounded by young sycamore trees in hedgerow.	Ivy covering main trunk.	Low
23	Mature oak spp. Approximately 11m tall with DBH of 110cm.	Some exposed branches where bark is missing.	Moderate

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24	Mature ash tree with thin branches and no foliage. Sparse ivy coverage on main trunk approximately 2m above ground level.	None	Negligible
26	Mature oak spp. Approximately 10m tall with DBH of 80cm.	Numerous branches overlapping to create gaps. Gaps under lifted bark. Hole in main trunk.	High
27	Semi-mature sycamore stood 1m in front of hedgerow. Approximately 7-8m tall.	Some holes in main trunk and broken branches.	Moderate
28	Semi-mature oak spp. Within hedgerow. Approximately 8m tall with DBH of 90cm.	Gaps between overlapping, thick branches.	Moderate
29	Mature oak spp. Stood 1m in front of hedgerow. Approximately 10m tall with DBH of 150cm.	Many gaps in broken branches and holes, and lifted bark.	High
30	Semi-mature oak spp. Approximately 8m tall. Defunct nest between branches.	Within hedgerow so couldn't observe all characteristics easily.	Negligible
31	Mature sycamore within hedgerow. Approximately 8-10m tall.	Some ivy coverage and various holes.	Moderate
32	Semi-mature oak spp. Approximately 8-10m tall.	Some gaps amongst ivy and broken branches.	Moderate
33	Semi-mature oak spp. Approximately 8-10m tall.	Some gaps amongst ivy and broken branches.	Moderate
34	Cluster of young-semi-mature willow trees and one silver birch tree. All with very thin branches and no obvious gaps.	None	Negligible
35	Mature oak spp. Approximately 8m tall with a DBH of 110cm. Next to the back garden of the holiday home.	Some ivy coverage and gaps in broken branches.	Moderate
36	Very young silver birch tree. Approximately 5-6m tall with a DBH of 20-30cm.	None	Negligible
37	Mature oak spp. Approximately 10m tall with DBH of 150cm.	None observed	Low
38	Cluster of young oak spp. beneath TN37.	None	Negligible
39	A semi-mature fruit tree species with thin branches.	None	Negligible
40	Cluster of young silver birch trees with thin branches, heights of approximately 8m and DBHs of 40cm.	None	Negligible
42	Five fruit-bearing trees in southern hedge of Field 2. Thin branches.	None	Negligible
43	Young silver birch approximately 3m tall with a DBH of approximately 15cm.	None	Negligible

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44	Young silver birch approximately 3m tall with a DBH of approximately 15cm.	None	Negligible
45	Young silver birch approximately 3m tall with a DBH of approximately 15cm.	None	Negligible
46	Young oak spp. approximately 3m tall with a DBH of approximately 40cm.	None	Negligible
48	Mature ash tree in a residential garden overhanging into field 2. Approximately 8m tall with a DBH of 80 cm. No obvious PRFs were observed.	Within a garden so couldn't observe characteristics easily, no PRFs seen.	Low
49 (Appears to be Tree 39 of arboricultural report)	Mature oak spp. Approximately 8-10m tall with a DBH of 200cm.	Various holes and gaps under broken branches.	Moderate
50	No description available		
51 (Appears to be Tree 36 and 37 of Arboricultural report)	Two ash trees behind the fence bordering the site. Approximately 6-7m tall with DBHs of 120cm.	Couldn't observe characteristics easily, no PRFs seen.	Low
52	Mature oak spp. Measuring approximately 10m tall.	Covered in very dense ivy along the length of the trunk.	Low
53	Mature female holly tree measuring approximately 6m tall. Next to TN52. Thin branches.	None	Negligible
54	Young female holly tree, measuring approximately 3-4m tall with a DBH of approximately 20-30cm.		Negligible
55	Semi-mature oak spp. Stands approximately 7m tall with a DBH of 100cm.	None	Low

Bat Habitat Suitability

The site is collectively considered to provide moderate quality foraging and commuting habitat for bats. There are lines of trees and hedgerows that form a continuous habitat on the site that is connected to the wider landscape that could be used by bats for commuting. Additionally, two bat roosts have been recorded within less than 1km of the site.

Bat Activity Transect Surveys

A summary of the results of the bat activity transect is provided in the table below.

Table 6: Summary of Bat Activity Transects

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Date	Sunset/ Start Time	End Time	Wind ¹⁹	Air Temp. (°C)	Cloud cover (%)	Rain
28 th August 2020	20:12	22:12	1	16	2/8	0
Low levels of bat activity comprising common pipistrelle (48 passes), soprano pipistrelle (12 passes) Myotis species (5 passes), noctule (10 passes) and long-eared bats (8 passes) and 8 (long-eared bat passes).						
26 th October 2020	16:58	18:58	1	11	8/8	0
Moderate levels of bat activity comprising Common pipistrelle (111 passes), soprano pipistrelle (38 passes), Myotis species (13 passes), noctule (4 passes) and serotine (3 passes).						

Plans 6A and 6B show the results of the bat activity transects.

Static Detector Surveys

A summary of the results of the static detector surveys is provided in the tables and graphs below and overleaf.

Table 7: Static Detector Survey Dates

Survey period	Start Date	End Date	Total Nights
Summer	28/8/2020	2/9/2020	5
Autumn	26/10/2020	31/10/2020	5

Table 8: Total Number of Bat Passes for Each Species in August-September 2020

Species	Total Number of Bat Passes (August-September 2020)										Totals	Average Number of Calls Per Night/Per Detector
	Detector 1					Detector 2						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5		
Common pipistrelle	54	153	113	49	69	135	116	91	47	84	862	43.1
Soprano pipistrelle	4	8	2	6	2		2	3	2	6	35	1.75
<i>Myotis</i> spp.	2	4	2		1	7	4	4	2	1	27	1.35
Brown long-eared					1	2					3	0.15
Lesser horseshoe		1				1					2	0.1
Noctule	2			7						1	10	0.5

¹⁹ Estimated on site using the Beaufort scale.

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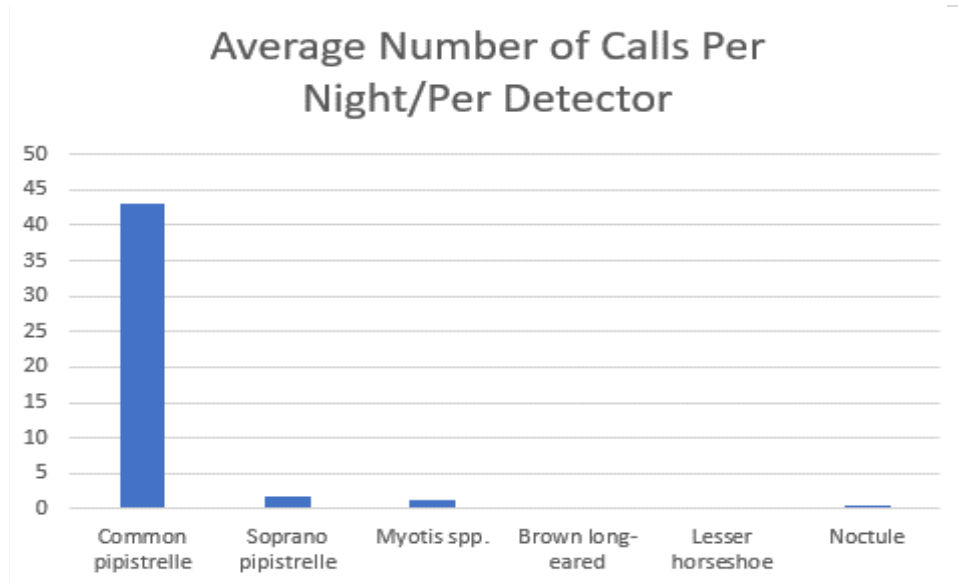
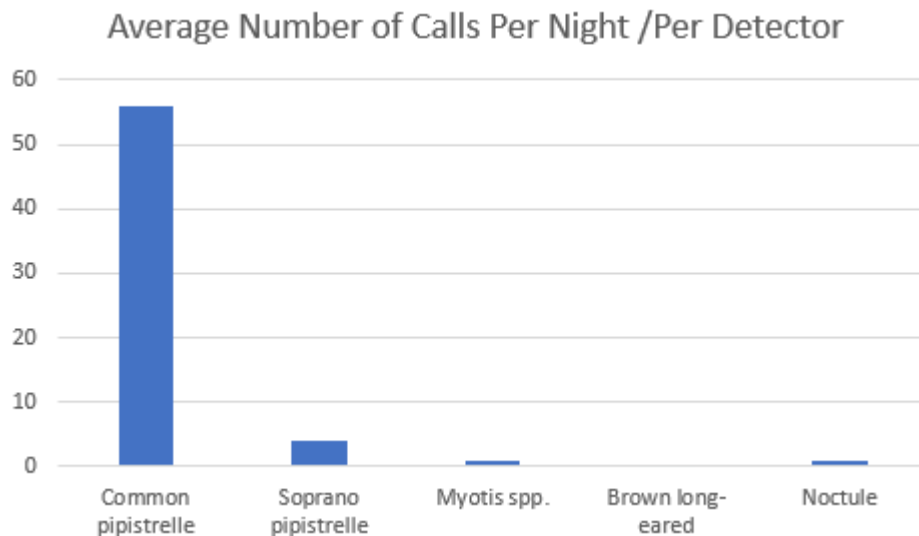


Table 9: Total Number of Bat Passes for Each Species in October 2020

Species	Total Number of Bat Passes (October 2020)										Totals	Average Number of Calls Per Night/Per Detector
	Detector 1					Detector 2						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5		
Common pipistrelle	119	111	84	63	78	115	132	184	122	108	1116	55.8
Soprano pipistrelle	3	2	8	14	6	24	8	4	6	5	80	4
<i>Myotis</i> spp.	4	1			3		3	8			19	0.95
Brown long-eared			2					1			3	0.15
Noctule		4		5			2			9	20	1



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However, the results of the summer and autumn activity transects and static detector surveys have demonstrated a moderate level of use by common pipistrelle bats and low levels of use of soprano pipistrelle (*Pipistrellus pygmaeus*), Myotis species, brown long-eared (*Plecotus auritus*), lesser horseshoe (*Rhinolophus hipposideros*) and noctule (*Nyctalus noctula*).

There did not appear to be a significant difference in activity between the two detectors.

3.5.4. Dormice

Desk Study Results

SEWBRc did not return any published records of dormice from within 1km of the site (SEWBRc data 2020).

Field Survey Results

No signs of dormouse were detected; however, the hedgerows present on the site have moderate suitability to support dormice. Some of the hedgerows are species rich (H1, H3 and H4) and all contain a variety of species which are important food resources for dormice including honeysuckle, field maple, bramble, hawthorn, hazel and oak. Additionally, these hedgerows are highly connected to the wider landscape of other agricultural fields surrounded by hedgerows (north of the site), which could allow arboreal movement throughout. The hedgerows, however, appear to be relatively well maintained in places, which slightly reduces the suitability for dormice.

3.5.5. Great Crested Newt

Desk Study Results

SEWBRc did not return any records of great crested newt from within 1km of the site.

There are records of other amphibians, comprising four records of common frog (*Rana temporaria*), one record of common toad (*Bufo bufo*), and one record of palmate newt (*Lissotriton helveticus*). The nearest record is of a common toad which was recorded approximately 800m to the south-east of the site.

Field Survey Results

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

There are no water bodies that are considered to be suitable for use by breeding newts within the site or within 500m of it.

Some of the hedgerows and more well-vegetated areas provide superficially suitable habitat for active terrestrial-phase great crested newts. However, there are no records of great crested newt within 500m of the site and no potential breeding sites lie within 500m of it. As a general rule, suitable habitats within 250m of a breeding pond are likely to be used most frequently by great crested newts (English Nature 2001). Therefore, when combined with the lack of records, the lack of direct evidence, and the fact the

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peripheral hedgerows will be retained, the likelihood of great crested newt being present on site and adversely affected by the development is considered to be very Low. This species is not discussed further in this report.

3.5.6. Badgers

Desk Study Results

The data search returned seven badger records within 1km of the site (SEWBReC data 2020). This included:

- Two outlier setts recorded approximately 850m to south-east of the site in 2009 and 2015; and
- An observation of a dead individual some 966m from the proposed development site.

The nearest record was a direct observation made in 2009, approximately 650m away towards the north-west of the site.

Field Survey Results

There was no evidence of badgers on site but there is a gap (TN57) in H6 to the west of the coppiced hazel shrub (TN11) that appears to have been made by a mammal; (see Photo 32). The lack of other signs of badger on site suggest that this is unlikely to be a result of the presence of badgers on site.

Photo 32: Hole in Hedgerow H6 (TN57)



3.5.7. Reptiles

Desk Study Results

The data search returned eight records of reptiles within 1km of the site (SEWBReC data 2020). These included one record of common lizard (*Zootoca vivipara*), four grass snake and two adder (*Vipera berus*). The nearest record is of a grass snake approximately 650m to the north-east of the site.

Field Survey Results

No reptiles were incidentally recorded during the survey, although a targeted reptile survey was not undertaken at that time. No evidence of reptiles such as sloughed skins was recorded.

Unlike some species, the precise floristic composition of habitats is often irrelevant to reptiles. Instead, the site's physical structure and thermal properties are more important (Edgar *et al.* 2011). The site supports hedgerow-grassland interfaces which could be suitable for basking behaviour, however, the grassland of the site is too damp to support large populations of reptiles. Additionally, the hedgerows are well connected to the surrounding landscape.

3.5.8. Marsh Fritillary and Small Pearl-Bordered Fritillary

Desk Study Results

SEWBRc returned one marsh fritillary record within 1km of the site (SEWBRc 2020). The nearest record was made in 1998, approximately 0.7km away towards the west of the site.

Field Survey Results

No direct evidence of marsh fritillary or small pearl bordered fritillary was recorded on site during the survey. Additionally, the larval foodplants of these species (devil's bit scabious and common dog violet respectively). The presence of these species being present on site is considered to be negligible and they are not mentioned further within this report.

3.5.9. Other Mammals

Desk Study Results

SEWBRc returned 27 records of other mammals within 1km of the site, comprising one invasive American mink (*Neovison vison*), one invasive grey squirrel (*Sciurus carolinensis*), 24 common hedgehog (*Erinaceus europaeus*) and one polecat (*Mustela putorius*). The nearest of which was a hedgehog record approximately 250m south of the site in 2011.

Field Survey Results

Evidence of molehills (*Talpa europaea*) were scattered throughout Field 2 (TN25, TN41 and TN47; see Photos 33-35) and a fox (*Vulpes vulpes*) was seen on site and it is likely that a range of other common small mammals are present on the site, including shrews, voles, mice, hedgehog etc, occurring either as resident species or whilst foraging and/or commuting.

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Photo 33: TN25 Mole Hills in North-West Corner of Field 2



Photo 34: TN41 Mole Hills in South-West Corner of Field 2



Photo 35: TN47 Mole Hills in South-East Corner of Field 2



3.5.10. Invertebrates

Desk Study Results

The data search returned no records of notable invertebrates from within the study area boundary itself. Numerous records within 1km were recorded, however, including of the carder bee (*Bombus humilis*), over 500m from site.

Field Survey Results

One red admiral (*Vanessa atalanta*) butterfly and two Carabidae beetles were observed on site.

4. Ecological Evaluation, Legislation and Impact Assessment

The ecological value of the *in-situ* habitats and the potential/actual presence of protected species are discussed in this section, along with a summary of relevant legislation and planning policies relating to habitats and species. Potential impacts on protected sites, *in-situ* habitats and protected or notable species arising from the proposed development, are identified including both direct and indirect impacts, and those associated with construction and operational stages.

4.1. Stepwise Approach to Maintaining Biodiversity

As part of the Future Wales: The National Plan 2040 and Planning Policy Wales (PPW) Edition 11 - 24th Feb 2021, planning authorities must follow a stepwise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for; enhancement must be secured wherever possible.

The first priority for planning authorities is 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 gain have been fully considered. This policy is mirrored within the Swansea Local Development Plan (2010-2025) - Policy ER9: Nature Conservation and Ecosystem Resilience Ecological Networks and Features of Importance for Biodiversity and the Development and Biodiversity Supplementary Planning Guidance Consultation Draft (Swansea City Council, 2021).

The process has been followed on site.

Avoidance – Avoidance has not been possible on site as the site owners do not own any alternative sites suitable for such a development. In addition, the site is allocated for residential development. The development proposals have been amended to allow the retention of as much of the central hedgerows as possible, although it is necessary to remove short sections of the hedgerow to facilitate the development of the site. This was accepted in principle by Swansea City Council in a November 2020 pre-application meeting, as well as the previous resolution to grant consent at the site in 2015. The hedgerow is largely being retained with only a small section being removed in the centre and in the south.

The arboricultural report proposes the removal of the following trees for arboricultural reasons: Trees T10, T14, T16, T34, T36, T37 and T39²⁰ due to poor quality (U category). The following trees are proposed for removal to facilitate the development: Trees G30 (part- for Plot 25 and associated highways works) and G48 (part- for internal roads) are proposed for removal to accommodate the development layout.

A step wise approach has been taken with G48 consisting of a group of category C trees whilst if the road had been moved further north, it would necessitate the removal of a category B tree, and if moved further south it would necessitate the removal of category C trees.

²⁰ The numbering of the trees in the arboricultural report is not consistent with the numbering of them within this report.

Mitigation – A comprehensive set of mitigation measures are provided within Section 5 of this report.

Compensation – Robust and comprehensive compensation measures are provided within Section 5 of this report.

4.2. Statutory Nature Conservation Designated Sites

There are no SACs within 2km of the site, and all three of the SSSIs that are present, are over 1km away from the site. Considering the distance between the site and the identified statutory conservation sites, no impacts are anticipated to arise from the development project. They are therefore not mentioned further in this report.

4.3. Non-Statutory Nature Conservation Designated Sites

4.3.1. Llys Nini SINC, Mynydd Garn Goch SINC and the M4 Corridor SINC

SINCs are considered to have substantive nature conservation value at the regional or district level. They are usually designated at the county borough level by the relevant local planning authority and are recognised as a planning constraint in the relevant statutory development plan.

Assessment of Ecological Value

These three SINCs are located within 400m of the development site and are all assessed as having regional and district ecological value by nature of their designation.

Assessment of Potential Development Impacts

The closest SINC to the development site is the Llys Nini SINC, which lies approximately 140m to the north of the development and is therefore the most at risk. The SINC supports comprises grassland, wet grassland, improved and unimproved grassland, deciduous ancient woodland, streams, ponds, scrub on a former industrial tip, reclaimed opencast mine and coppiced woodland. Whilst there could potentially be increased noise, light spill, human disturbance and disturbance from pets associated with the development site. Any such impacts could potentially have significance in the district context, but will be preventable through the implementation of suitable mitigation measures as detailed within Section 5.

4.4. Assessment of Ecological Value of On-site Section 7, LBAP and SINC Habitats

4.4.1. Hedgerows

Assessment of Ecological Value

All hedgerows are listed in the UK BAP and Section 7 as a 'habitats of principal importance for conservation of biological diversity in Wales' (Environment (Wales) Act 2016; Wales Biodiversity Partnership, 2016). Furthermore, species rich hedgerows (H1, H3 and H4) are listed in Swansea's LBAP as priority habitats. Overall, the hedgerows are therefore considered to have national, regional, and high local ecological value.

Assessment of Potential Development Impacts

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The species rich hedgerows in Field 1 (H1, H3 and H4), and hedgerows with trees that border Field 2 and the southern boundary of Field 1, will be retained. The central hedgerow with trees (H5) that divides Fields 1 and 2, will be breached in places. Consequentially, ecological connectivity between the north and south of the site is anticipated to be reduced. Recommendations to avoid and mitigate impacts are presented in Section 5 of this report.

No other Section 7 (Environment Wales Act, 2016), LBAP or SINC habitats will be impacted by the proposed works.

4.5. Assessment of Ecological Value of On-site Habitats Which Do Not Qualify as Section 7 LBAP and SINC Habitat

4.5.1. Mixture of Low-Grade Habitats

Assessment of Ecological Value

No particularly noteworthy plant species were recorded from the improved grassland, rush-dominated grassland, tall ruderal vegetation or running water habitats during the current survey, nor were they exceptional examples of their type. These habitats, however, undoubtedly will have local value for fauna such as nesting/foraging birds, foraging/commuting bats, small mammals and invertebrates, and they are therefore considered to be of local value to wildlife.

Assessment of Potential Development Impacts

The improved and rush-dominated grassland will be lost permanently and therefore the development will have negative impacts on the species that rely on the grasslands and reduce ecological connectivity. The tall ruderal vegetation and running water found near hedgerows may be retained along with the hedgerows. Therefore, it is anticipated that the direct impacts of the proposed developments on the latter habitat types and habitats outside of the site will include accidental damage to hedgerows and trees, potential pollution of the ditches found at the site's boundaries and habitats outside of the site. Appropriate mitigation is outlined in Section 5.

4.6. Protected and Notable Species

4.6.1. Birds

Assessment of Ecological Value of Site for Birds

The numerous broadleaved trees and hedgerows that support numerous woody and shrub species including hawthorn, hazel and bramble, provide numerous nesting and foraging opportunities for birds, including a range of UK BAP and Red List species such as bullfinch (*Pyrrhula pyrrhula*), dunnock (*Prunella modularis*), song thrush (*Turdus philomelos*) and starling which were recorded in the wider area (SEWBRc 2020). Additionally, Section 1 birds including barn owl (*Tyto alba*), have also been recorded within 1km of the site in seven different locations; the nearest record is 481m away and was recorded in 2008.

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The grasslands could provide valuable feeding areas for species that capture invertebrates on the wing, including swallows and house martins, which have been recorded on-site. It is unlikely that nesting birds would use the fields because the likelihood of trampling from livestock is high. The presence of ground nesting birds, however, cannot be ruled out. Additionally, the ruderal vegetation is also suitable for nesting by common nesting birds as well as priority species such as dunnock. It is anticipated that these habitats will also be valuable foraging sites for seed-eating and insectivorous birds.

Finally, the defunct nest present in an oak tree (TN30) shows that the site is of ecological value for nesting birds. Therefore, taking into account the overall evidence of nesting and food availability within the site, as well as the presence of protected and important species, and the strong connectivity to similar habitats, it is anticipated that the site has high local ecological value for a range of bird species.

Legislation

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

Impact Assessment of Proposed Development on Birds

The permanent loss of grassland habitats will negatively impact numerous bird species, especially those that forage for invertebrates. Additionally, the proposed development will result in the permanent loss of potential ground nesting sites within the grassland that could potentially be utilised during the breeding season (March to August inclusive). Additionally, the permanent loss of some of the central hedgerow (H5) may result in the accidental destruction or disturbance of nests, and therefore carries the risk of committing an offence. Any birds nesting within the peripheral hedgerows are assessed to remain unimpacted, assuming that these hedgerow habitats will be maintained. Any vegetation clearance undertaken during the bird breeding season, could potentially result in the direct killing or injuring of any birds nesting within the grasslands and H5. Therefore, the impact upon individual nesting birds has potential to be high at the site level. Recommendations to avoid destruction or disturbance of nests and for nesting enhancements to ensure that no net losses to nesting sites occur as a result of the works are included in Section 5.

4.6.2. Bats

Assessment of Ecological Value of Site for Bats

Potential Tree Roosts

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Two trees are assessed as having high potential for roosting bats whilst 10 are assessed as having moderate potential and 15 with low potential (see Table 5). The remaining broadleaved trees were assessed as having negligible potential for roosting bats.

Potential Foraging and Commuting Habitat

The site provides moderate-quality foraging and commuting habitat for bats. There are lines of trees and hedgerows that form a continuous habitat on the site that is connected to the wider landscape that could be used by bats for commuting. There are expanses of residential housing, however, to the south of the site which prevents the site from being assessed as high ecological value for bats. Additionally, two bat roosts have been recorded within less than 1km of the site and bats have been previously recorded foraging and commuting on the site during transect surveys conducted by RSK Carter Ecological Ltd. in 2010. In addition, two sets of transect and static detector surveys were undertaken by Acer Ecology Ltd in 2020, which are reported upon in a bat activity report.

Five species listed on Part 1, Section 7 of the Environment (Wales) Act 2016 as '*living organisms of principal importance for maintaining and enhancing biodiversity in relation to Wales*' were recorded on site: soprano pipistrelle, common pipistrelle, noctule; brown long-eared; and lesser horseshoe. Lesser horseshoe (30,900 individuals within Wales) are relatively uncommon, within Wales (Mammal Society 2020). Only a single contact of this species was recorded within the site.

Legislation

All species of bats and their roosting sites are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species and Planning (various amendments) (England and Wales) Regulations 2018. All species of UK bats are designated as 'European Protected Species'. Seven species of bat (soprano pipistrelle (*Pipistrellus pygmaeus*), barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), noctule (*Nyctalus noctula*), brown long-eared (*Plecotus auritus*), lesser horseshoe (*Rhinolophus hipposideros*) and greater horseshoe bats (*Rhinolophus ferrumequinum*)) are listed under Section 7 of the Environment (Wales) Act 2016 as being of principal importance for maintaining and enhancing biodiversity in Wales.

Impact Assessment of Proposed Development on Bats

The addition of artificial light to the site from residential homes could negatively reduce the ecological value of the remaining hedgerows and trees for commuting and foraging bats, especially particularly light-sensitive species such as lesser and greater horseshoes (although there is no evidence to suggest that these species are present on site). Therefore, an appropriate dark corridor should be implemented in the development to ensure that bats can continue to utilise the site.

Additionally, the permanent loss of the grassland habitats will most likely reduce the ecological value of the site for foraging bats.

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In the long term, the erection of approximately 180 houses could enhance the roosting opportunities available for bats assuming that appropriate enhancement measures are delivered (see Section 5).

Assessment of Proposed Development Against Bat Surveys for Professional Ecologists Guidance

The development proposal are of a type listed within Box 1 of section 1.2.3.2 (page 13) of Bat Surveys for Professional Ecologists (Collins, 2016) and consequently, it is considered that bat surveys should be undertaken on the site. Section 8.6 of the Bat Surveys for Professional Ecologists (Collins, 2016) states that the level of survey effort should be proportionate to the likely use of the site by bats and the potential effects of the proposed development on the species present. The following factors confirm the need for such surveys:

- Potential for felling, removal or lopping of woodland and hedgerows;
- The large scale of the potential development and the associated land-take;
- Potential for floodlighting during construction;
- Potential for streetlighting post-construction;
- Proposal on a site where bats are known (surveys are ongoing); and
- A change of use of the site.

Recommendations for further surveys are detailed Section 5.

4.6.3. Dormice

Assessment of Ecological Value of Site for Dormice

The species rich hedgerows in Field 1 and those where hazel (a favoured foodplant of dormice) is supported in Field 2 are particularly valuable for dormice. The hedgerows on the site are considered to provide moderate-quality dormouse habitat, however, because they are well-maintained, which could slightly deter dormice. The extent of any dormouse populations on site is unknown.

Legislation

Dormice are a 'European protected species' and afforded full protection under both UK and European legislation. Dormice are listed under Section 7 of the Environment (Wales) Act 2016 as being of principal importance for maintaining and enhancing biodiversity in Wales. Since 2000, the UK population has declined by over a half (51%), decreasing on average by 3.8% year (PTES, 2019). It is included in Swansea City and County Council Local Biodiversity Action Plan.

Impact Assessment of Proposed Development on Dormice

The clearance of portions of the central hedgerow (H5) on site could result in the permanent loss of moderate-quality dormouse habitat which could result in (limited) habitat fragmentation. If undertaken during the active season, works could result in the direct injury or mortality of individuals, and the potential loss of nest sites. If undertaken during the hibernation season for dormice, hibernating individuals within the works area could potentially be killed, injured, or disturbed.

During construction, the main temporary negative impacts to dormice are anticipated to be noise, accidental damage, and floodlighting all causing disturbance. Whereas post-construction main impacts are anticipated to include street lighting, human interference, and a significant increase in predation from domestic cats.

Further surveys are ongoing to determine their presence or likely absence more definitively, and to determine the extent of any populations on site. Full details of the further survey requirements are set out in Section 5.

4.6.4. Badgers

Assessment of Ecological Value of Site for Badgers

No other evidence of badgers was recorded across the survey area, although it is possible that they could on occasion pass through and forage on the site.

Legislation

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

Impact Assessment of Proposed Development on Badgers

The loss of the grassland habitats will permanently lose potential foraging and commuting habitat for badgers.

Badgers may pass through occasionally when foraging or commuting. As badgers are nocturnal, it is considered unlikely that any resident badgers will be encountered on site during works, however, appropriate mitigation is recommended in Section 5 should badgers enter the construction site.

4.6.5. Reptiles

Assessment of Ecological Value of Site for Reptiles

Common reptiles have been recorded within 1km from the site. The central parts of the site offer limited potential for reptiles where the short grassland offers limited cover. The interfaces between the grassland and hedgerow bases along all boundaries of the site offer sheltering and foraging opportunities. Furthermore, these areas extend over moderate lengths and could therefore feasibly support viable reptile populations

Legislation

With the exception of smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) (which are afforded greater protection), common reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are given so-called 'partial protection', which prohibits the

deliberate killing or injury of individuals. The habitats of common reptiles are not specifically protected. These species are, however, listed as priority species in Wales under Section 7 of the Environment (Wales) Act 2016.

Impact Assessment of Proposed Development on Reptiles

There is a risk that resident reptiles could be injured or killed when the works are carried out. The footprint of the works will affect the whole area of grasslands, and portions of the central hedgerow (H5) could be lost permanently. The proposed development will involve permanent loss of the grasslands, and therefore will lose potential foraging sites for reptiles. The development of a new attenuation basin in the south-west corner of Field 2 could however, enhance the ecological value of the site for grass snakes, which can hunt in water. Further surveys are ongoing to identify the presence/likely absence of reptile populations on the site before a final assessment can be made on the potential impacts to this species group (See Section 5).

4.6.6. Hedgehog

Assessment of Ecological Value of Site for Hedgehogs

Hedgehogs are considered likely to forage within the site and could potentially nest within the hedgerow habitats. Therefore, the site is considered to have local ecological value for hedgehogs.

Legislation

Hedgehogs are afforded partial protection under the Wildlife and Countryside Act (1981) and are listed as priority species under Section 7 of the Environment (Wales) Act 2016. Additionally, hedgehogs are listed a priority species listed under the UK Biodiversity Action Plan in light of dramatic population declines. The legislation afforded to hedgehogs in the Environment Wales Act (2016) all public bodies including Local Authorities to have regard for biodiversity conservation²¹ when carrying out their functions.

Impact Assessment of Proposed Development on Hedgehogs

The impact on potential hedgehog habitat on site is considered to be relatively low. Despite that the foraging grassland habitat will be permanently lost, other foraging habitats are immediately present in the surrounding agricultural fields. Additionally, the majority of hedgerows are being maintained surrounding the periphery of the site, of which are denser than H5.

If works are conducted during their hibernation period, individuals could be injured and killed. The permanent loss of the grassland could lead to negative impacts upon this species, if present, by reducing feeding opportunities. Mitigation measures are recommended to enable the requirements of the local planning authority to be met (See Section 5).

²¹ Biodiversity conservation in respect to hedgehogs is interpreted as a commitment to restoring or enhancing their population.

4.6.7. Invertebrates

Assessment of Ecological Value of Site for Invertebrates

While the site contains habitats that are suitable for a range of invertebrates (improved grassland, trees, hedgerows, and flowering plants etc.), these habitats are common and widespread in the surrounding landscape. Therefore, the site is assessed to have ecological value for invertebrates at the site level.

Legislation

Numerous invertebrates are listed under the Swansea County Borough, LBAP, national BAP, and Section 7 of the Environment for Wales Act (2016), including various species of bees (e.g. Brown-Banded Carder Bee (*Bombus humilis*)), ants, butterflies (e.g. marsh fritillary) and moths.

Assessment of Development Impacts of Proposed Development on Invertebrates

The proposed developments will involve the removal of all grassland areas, of which various invertebrates, including generalist butterfly species (Personal communication. Dr Deborah Sazer. 07.08.20), rely on for foraging and reproducing. Therefore, loss of larval food plants for butterflies in particular anticipated.

The provision of a an attenuation basin in the south-western corner of the site could, however, benefit invertebrate species including those that require freshwater to complete their lifecycles such as dragonflies. Whilst some grassland habitat loss will occur, this can be more than offset by enhancing the floristic habitats within the development that will benefit invertebrates using the compensation practices outlined in Section 5.

5. Required Actions

The following recommendations are likely to be secured through planning conditions. They have been developed based on the full application development proposals. The implementation of these recommendations will ensure compliance with the Environment (Wales) Act 2016 (including Sections 6 and 7), Planning Policy Wales version 11 (Welsh Government, 2021)²², TAN 5 *Nature Conservation and Planning* (2009), Future Wales: The National Plan 2040, The Conservation of Habitats and Species Regulations 2017 and the Biodiversity Supplementary Planning Guidance Consultation Draft (Swansea City Council, 2021), and help to avoid or minimise adverse impacts on the environment and protected species, mitigate and compensate for losses where damage is unavoidable and promote opportunities to enhance biodiversity.

There is a requirement that developments must provide net benefit for biodiversity.

5.1. Further Survey Work

Works in parts of the site which could affect protected species (i.e dormouse or reptiles) will not commence until the surveys below have been carried out. Results from these surveys will inform and allow for targeted recommendations for the avoidance (e.g. timing of works), future mitigation and compensation measures required as part of the development, and determine if any protected European Protected Species development licences are required.

5.1.1. Reptile Surveys

Surveys to determine the presence/likely absence of reptiles will be carried out between April and September – ideally in the months of April, May, June or September (Natural England²³ Technical Information Note TIN 102²⁴). The survey will need to follow the advice provided by the Herpetofauna Workers' Manual (Gent and Gibson, 2003), and comprise a 'direct search' and the monitoring of artificial and naturally occurring refugia placed in areas of the site assessed as being most attractive to reptiles (e.g. longer grass, hedgerow interfaces etc.).

A variety of different types of refugia will be used. Refugia will be set at grassland-hedgerow interfaces across the whole site. Refugia will comprise primarily of squares of roofing felt, carpet tiles, corrugated metal tins and corrugated bitumen-based roofing felt of varying sizes but at least 60cm x 60cm in size. Naturally occurring refugia including discarded logs, timber and large rocks etc. will also be checked. Where possible, artificial refugia will be laid in south-facing positions in areas deemed least likely to attract human interference. Refugia will be left undisturbed on site for two weeks, prior to commencement of the survey to allow the reptiles on the site sufficient time to find and start utilising them. The refugia will then be checked on at least seven separate occasions, non-consecutively, in suitable weather conditions (warm, overcast periods with low wind speeds) to record any reptile species beneath or basking upon them. As a

²² Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions ... and in so doing promote the resilience of ecosystems. Development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.

²³ Natural England guidance is referenced as no equivalent guidance has been produced by Natural Resources Wales.

²⁴ The reptile mitigation guidelines were withdrawn in 2011.

guideline, it is recommended that the optimal time to survey reptiles is between 08:30 and 11:00 or 16:00 and 18:30, and when the air temperature is between 9°C and 18°C²⁵ (Froglife, 1999). Heavy rain and wind are deemed unsuitable for surveying reptiles (Froglife, 1999). Ideally, the survey will be spread out across the survey season.

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

At the time of the Phase 1 Habitat Survey undertaken by RSK Carter Ecological in 2010 the County Ecologist of City and County of Swansea Council agreed that as the majority of the habitat on-site most suitable for reptiles is being retained (i.e habitats bordering the hedgerows) and additional habitat creation is being undertaken, a full reptile survey was unnecessary. It was agreed that the hedgerow sections that may be lost can be hand searched and cleared prior to and the grassland bordering the hedgerows subject to species deterrence and displacement measures. It may be possible for a similar approach to be taken instead of undertaking further surveys for reptiles. Such an approach would need to be agreed with the county ecologist.

5.1.2. Dormouse Surveys

A nest tube survey should be undertaken in order to determine the presence/ likely absence of dormice on site using the methodology outlined in The Dormouse Conservation Handbook 2nd Edition (Bright *et al.*, 2006).

Nest boxes will be positioned across the site's hedgerows at 10-20m intervals, as well as on adjoining suitable habitat. These will be monitored over the course of the survey season (April-November) to determine dormouse presence/ likely absence. It is recommended that nest tubes are checked once every month, as dormouse nests may degrade, especially when overtaken by wood mice, and can lose many of their unique characteristics.

Survey effort for dormice is based on the index of probability scoring system (Bright *et al.*, 2006), where different months have a different likelihood of dormice being detected. For example, 50 nest tubes installed in March and left in situ until the end of November would score 25 (the sum of probability index figures for each month) and 100 tubes for the same period would score 50, i.e. double the search effort (see Table 1 for details of the scoring system). Nest tubes are most frequently occupied in May, August and September and so these months score highest. At least 20 points need to be accrued to ensure sufficient survey effort has been undertaken to determine likely absence.

Table 10: Index of probability of finding dormice present in nest tubes throughout the year (Bright *et al.*, 2006).

²⁵ Natural England's Reptile Mitigation Guidelines recommend that the temperature is between 10-20°C.

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Month	Index of Probability (50 Tubes)	Factor of 2 (100 tubes deployed)
April	1	2
May	4	8
June	2	4
July	2	4
August	5	10
September	7	14
October	2	4
November	2	4
		Total

Twenty points will be achieved in September if 50 nest tubes are deployed, or in August if 100 tubes are deployed.

5.1.3. Bat Surveys

Habitat Suitability

The site was considered to have moderate suitability for foraging and commuting bats, with both livestock-grazed pasture and hedgerow habitats and mature broadleaf trees present. The site may be of value to the Annex II Habitats Directive bat species (lesser and greater horseshoe bats) that roost nearby in Parkmill Woodlands and Llethrid Valley SSSI and Rose Cottage SSSI. In addition, a number of potential roosting opportunities for crevice dwelling species (e.g. *Pipistrellus* species) occur within mature and semi-mature trees within the site.

Table 8.3 of the Bat Survey Guidelines (page 58; Collins, 2016) found in Appendix 7 of this report, states that habitats with any 'suitability for bats' should be subject to a transect and remote detector survey. In moderate suitability sites at least one survey visit per month (April to October) should be undertaken in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn surveys within one 24-hour period. In addition to the transect surveys, in at least two locations per transect, data should be collected using automated/static bat detector surveys whereby data is collected on five consecutive nights per month (April to October) in appropriate weather conditions for bats.

Acer Ecology Ltd. has already been commissioned to conduct transect bat surveys for the area, which took place in the summer and autumn of 2020. A further spring survey will be undertaken in 2021. Whilst a moderate suitability habitat would normally require monthly surveys to be undertaken, assuming that a sensitive lighting scheme is introduced the three surveys (i.e one per season) may be sufficient. This would need to be agreed with the county ecologist.

Works will not be carried out until the results are reported and the consequential mitigation methods are recommended. See the *Bat Survey Report* in preparation by Acer Ecology Ltd. (2020) for further details.

Trees and Roosting Potential

The arboricultural report proposes the removal of the following trees for arboricultural reasons: Trees²⁶ T10, T14, T16, T34, T36, T37 and T39 due to poor quality (U category). Tree 39 has provisionally been assessed as having Moderate bat roosting potential. The following trees are proposed for removal to facilitate the development: Trees G30 (part of- for Plot 25 and associated highways works) and G48 (part of- for internal roads) are proposed for removal to accommodate the development layout. Plan 8 shows the locations of the trees proposed for removal. In addition, other work is proposed on trees such as the removal of dead wood.

An update ground-level tree assessment should be undertaken of the trees proposed for removal and dusk emergence and dawn re-entry surveys undertaken of any trees with moderate or high roosting potential. Any works affecting any trees which are known to or found to contain roosting bats would require an appropriate licence from Natural Resources Wales issued under the Habitat Regulations 2017.

5.2. Precautionary Measures

5.2.1. Hedgerow and Tree Protection

The hedgerows and trees being retained will be protected and securely fenced-off with appropriate temporary fencing (e.g. 'Heras' fencing). The fences will be erected prior to the start of construction work. The temporary fences will be left in place and maintained until development of the site has been completed. For the duration of the construction and operational phases of the development, the retained hedgerows and trees will be protected in accordance with the specifications of BS5837: 2012 Trees in Relation to Design, Demolitions and Construction during the development.

5.2.2. Timing of Vegetation Clearance for Birds, Reptiles and UK BAP Mammals

Hedgehogs

Hedgehogs may feasibly be present within the hedgerow understoreys. Measures to prevent the direct harm of this species should concentrate primarily on minimising the risk of causing the death and injury of individuals during any hedgerow clearance to facilitate site access. This should be achieved through the use of 'species deterrence' measures in the run-up to the commencement of works on-site, possibly coupled with 'destructive searching' of any potential refugia that may be present at the time of site clearance.

If any interfaces between the hedgerows and the grassland are required for clearance to facilitate construction works, the clearance of the hedgerows should be undertaken by strimming or brush cutting to a height of approximately 300mm during April to August, to make the area less suitable for hedgehogs. Arisings should be removed immediately from site. This will be left for at least 48 hours and then cut down

²⁶ The numbering of the trees in the arboricultural report is not consistent with the numbering of them within this report.

to near ground level and left for another 48 hours prior to works commencing. This should make the areas more unattractive to hedgehogs prior to development and thus encourage them to leave the area. Mechanical clearance methods (e.g. gang-mowing, flail-cutting etc) will not be used.

Birds

Ideally, any vegetation clearance should occur outside of the bird besting season (1st March to 31st August inclusive).

Should clearance works fall within the bird nesting season, the hedgerows should be subject to a check for nesting birds by a suitably qualified ecologist immediately prior to removal of such habitats. If any active nests are found, these should be protected, along with an appropriate buffer zone of approximately 15m, until the nesting is complete, and the young have fledged.

Reptiles

No vegetation clearance shall take place until the completion of the further reptile surveys detailed in Section 5.1. These surveys are ongoing.

5.2.3. Species-Sensitive Construction

Good construction practice for badgers, hedgehogs and other mammals will be adopted. Specifically, any open trenches and excavations associated with the development will either be closed at night or a means of escape provided (e.g. plank at no greater angle than 45°) to help trapped animals escape.

5.2.4. Noise

The following noise avoidance measures will be followed during any ongoing or future works within the site. This will help to ensure that disturbance to wildlife (e.g. badgers and dormice) which may be present nearby is kept to an absolute minimum:

- Unnecessary revving of engines will be avoided, and equipment will be switched off when not required;
- Plant machinery will be properly maintained particularly the silencers and bearings;
- Working methods will be designed to avoid the use of particularly noisy plant machinery and vehicles;
- Plant machinery will be started sequentially rather than together;
- All plant machinery will be operated with noise control hoods closed; and
- Work on site will take place during daylight hours without the use of artificial lighting.

5.2.5. Sensitive Lighting Strategy

Artificial lighting during the construction phase could temporarily disturb light sensitive bat species (e.g. horseshoe bats), badgers and particularly dormice. Therefore, work will be restricted to daylight hours only and no artificial lighting during the night.

5.2.6. Pollution Control and Construction and Environmental Management Plan

Care should be taken to avoid pollution of the area surrounding the construction site and the ditches found bordering the fields, during the construction and post-construction phases.

The measures to be implemented are partly outlined in the Environment Agencies²⁷ guidance document 'Working at construction and demolition sites: PPG6 Pollution Prevention Guidelines²⁸ and 'Guidance for Pollution Prevention Works and maintenance in or near water: GPP 5' It is advisable that this is detailed within a Construction and Environmental Management Plan²⁹ (CEMP), conditioned as part of the planning consent.

5.3. Mitigation Measures

5.3.1. Lighting Plan

The artificial light levels post-construction will significantly increase from the 180 residential homes that are to be erected. A dark corridor will be required to ensure that bats can still utilise the hedgerows as foraging and commuting habitats, and the trees as roosting sites.

External Lighting

External lighting will be absent from the elevations of the residential houses that lie parallel with the hedgerows and trees, thus creating a 'dark corridor' to avoid causing disturbance to roosting bats that commute along the vegetation.

The lighting design for the site will be of a 'bat-friendly' specification, comply with the Institute for Lighting Professionals and Bat Conservation Trust's guidance (2018) and kept to the minimum level which meets the needs of security and health and safety. The unnecessary lighting of habitats which could potentially be used by foraging bats such as the nearby trees and hedgerows will be avoided.

External lighting will be minimised and installed at low-level only (i.e. no higher than eaves level and lower than 2.4m) and directed downward (i.e. below the horizontal plane with no upward tilt). Fully shielded lights with front and side hoods/shields or cowls will be installed to prevent upwards and horizontal light spill. Lighting will not be located in the vicinity of, or shine towards, the bat access points in trees or commuting routes and flight lines, thus maintaining a 'dark corridor' and avoiding/minimising disturbance to roosting bats. Any security lights used will operate off a passive infrared (PIR) motion sensor sensitive to large objects only, to avoid constant triggers by bat passes and with timers set on a short duration (i.e. a maximum 'on' time of one minute) reduce the amount of 'lit time'. The lights will either have an integrated LED light source or use LED bulbs. They will be low intensity (i.e. circa 11 watts) and have a warm white colour temperature of 3000K or less. White, blue and green lighting sources including mercury or metal

²⁷ Environment Agency guidelines are recommended as no equivalent guidance has been produced by Natural Resources Wales.

²⁸ Available online at <http://bit.ly/1K1117H>. Note these guidelines were withdrawn on the 14th December 2015 but are still considered relevant.

²⁹ The CEMP should consider the list of issues and activities listed within BS 42020:2013, Clause 10.

halide, CPO and CDO (ceramic discharge metal-halide) bulbs which have a significant effect on bats will be avoided.

Artificial and Semi-Natural Screening

Fencing could be installed, or semi-mature shrubs planted in the surrounding areas of the residential homes that will lie parallel with the hedgerows. By doing so, this could mitigate the amount of light spill reaching the hedgerow corridors, and therefore reduce the negative impacts on foraging and commuting behaviour.

5.4. Compensation and Enhancement Measures

5.4.1. Compensatory Planting and Vegetation Enhancement

Hedgerows and Trees

The hedgerows with gaps (H5 – H9) will be enhanced to increase their ecological value to nesting birds, dormice, invertebrates and therefore foraging birds, mammals (including bats, hedgehogs and badgers) and reptiles. The hedges will be bolstered with new stock of local provenance reflecting the species already present to fill the gaps and give a 2m minimum width of planting. Areas of the hedgerow dominated by bramble (e.g. H9) will be cut back to allow the plantings to succeed. Bramble will not be removed or controlled by weed killers as it has high value for dormice. It will only be controlled by cutting through the hedgerow establishment phase.

Breaches of the central hedgerow will be compensated by the creation of new hedgerows of similar type and species-composition elsewhere in appropriate locations.

Landscaping

Any new planting and landscaping in rear gardens of the properties and proposed green spaces will use native shrubs and trees which are of UK provenance.

Landscaping proposals for the site are shown in drawings 1898-URB-XX-XX-DR-L-90-0203-General Arrangement 1-8. The following seed mixes are proposed:

- Emorsgate Seeds EL1 Flowering Lawn Mixture;
- Emorsgate Seeds EM2 Standard General Purpose Meadow Mixture;
- Shade-tolerant wildflower mix;
- Emorsgate Seeds EM8 Meadow Mixture for Wetlands for attenuation basin base; and
- Emorsgate Seeds EM4 Meadow Mixture for Clay Soils.

The existing hedgerow bisecting the site will be enhanced with further native species planting and tree planting to create a wildlife corridor.

Native hedge planting, tree and shrub and ornamental hedge planting will be undertaken.

Avoidances

The following will be avoided during landscaping:

- The use of herbicides, pesticides and artificial fertilisers in the landscaped areas should generally be avoided, although pernicious weeds may need to be spot-treated with herbicide; and
- Peat-based products should not be used in the landscaping of the site.

5.4.2. Bat Roost Provisions

The proposed development will involve the installation of additional bat boxes on the site to enhance roosting potential of the site for bats. It is proposed that these will be installed in hedgerow trees surrounding the site. Any species-specific requirements will be identified in the recommended transect surveys. See *Bat Survey Report in preparation* (Acer Ecology Ltd., 2020) for specific bat compensation and enhancement measures.

5.4.3. Bird Nesting Provisions

In order to enhance bird nesting opportunities, artificial bird boxes should be erected. A variety of durable, woodcrete bird boxes, including maintenance free boxes suitable for trees, are available from Schwegler. See Appendices 9-11 for further details.

Bird boxes should be fitted to retained semi-mature and mature trees within the site boundary and upon 25% of the residential dwelling themselves. They should be located in secluded positions, ideally within dense cover and at a minimum height of 3 metres from ground level.

Specialised boxes that cater for specific bird species:

- Open fronted – Open fronted nest boxes cater for a range of bird species, including robin, dunnock, wren (*Troglodytes troglodytes*) and pied wagtail (*Motacilla alba*). Due to the more exposed nature of these nest boxes, it is especially important to ensure that they are located in dense cover in order to avoid the attention of potential predators. Suitable locations could be within ivy coverage of the broadleaved trees, or within dense areas of hedgerow; and
- Standard nest boxes – An entrance hole of 32mm will attract species such as great, blue and great tit and sparrows. These nest boxes can be sited in a wide range of locations throughout the site.

5.5. Longevity of Report

If development works do not begin within eighteen months to two years of the date of this report of this report, an update survey is likely to be required in accordance with guidance from Natural Resources Wales (NRW)³⁰ (CIEEM, 2019) and BS 42020:2013³¹, to determine if conditions have changed since those described in this report.

³⁰ As set out in Point 5 of the NRW *Bat Surveys - Frequently Asked Questions* and Point 4 of the guidance included within the NRW European Protected Species Development Application Form.

³¹ As set out in Section 6.2.1, point 7 which states that ecological information should not normally be more than two/three years old, or as stipulated in good practice guidance).

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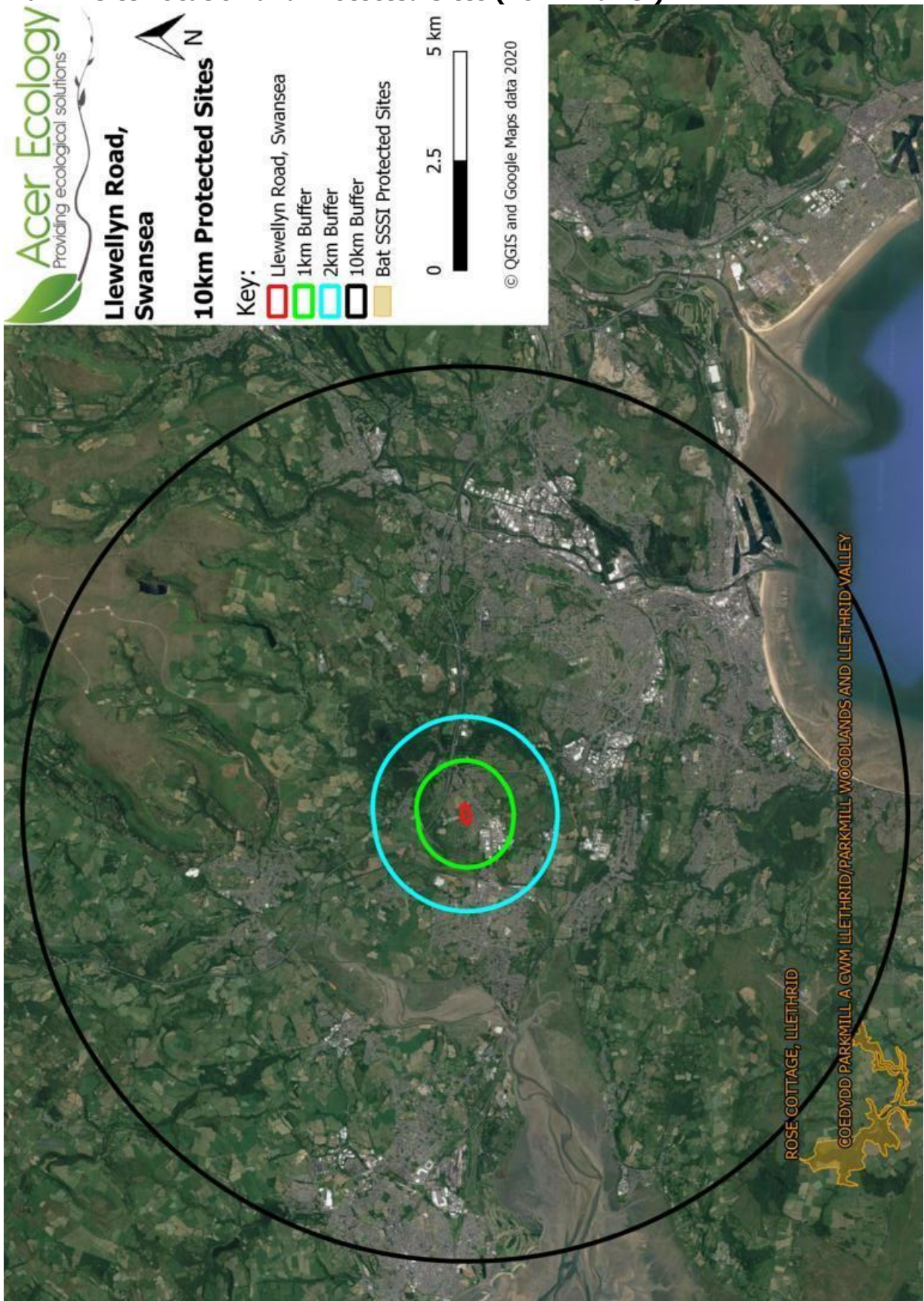
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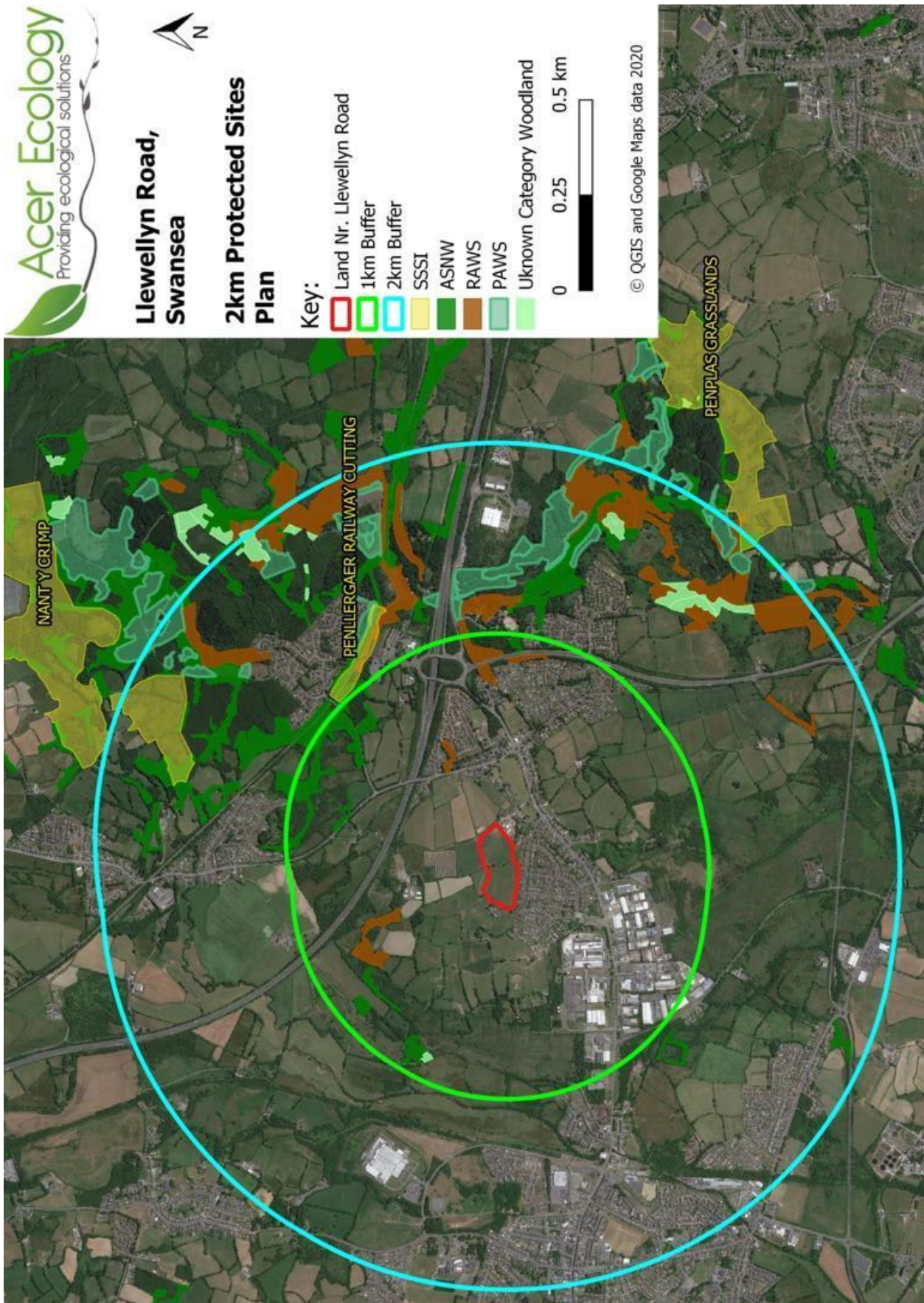
Plan 1: Site Location



Plan 2: Site Location and Protected Sites (10km Buffer)

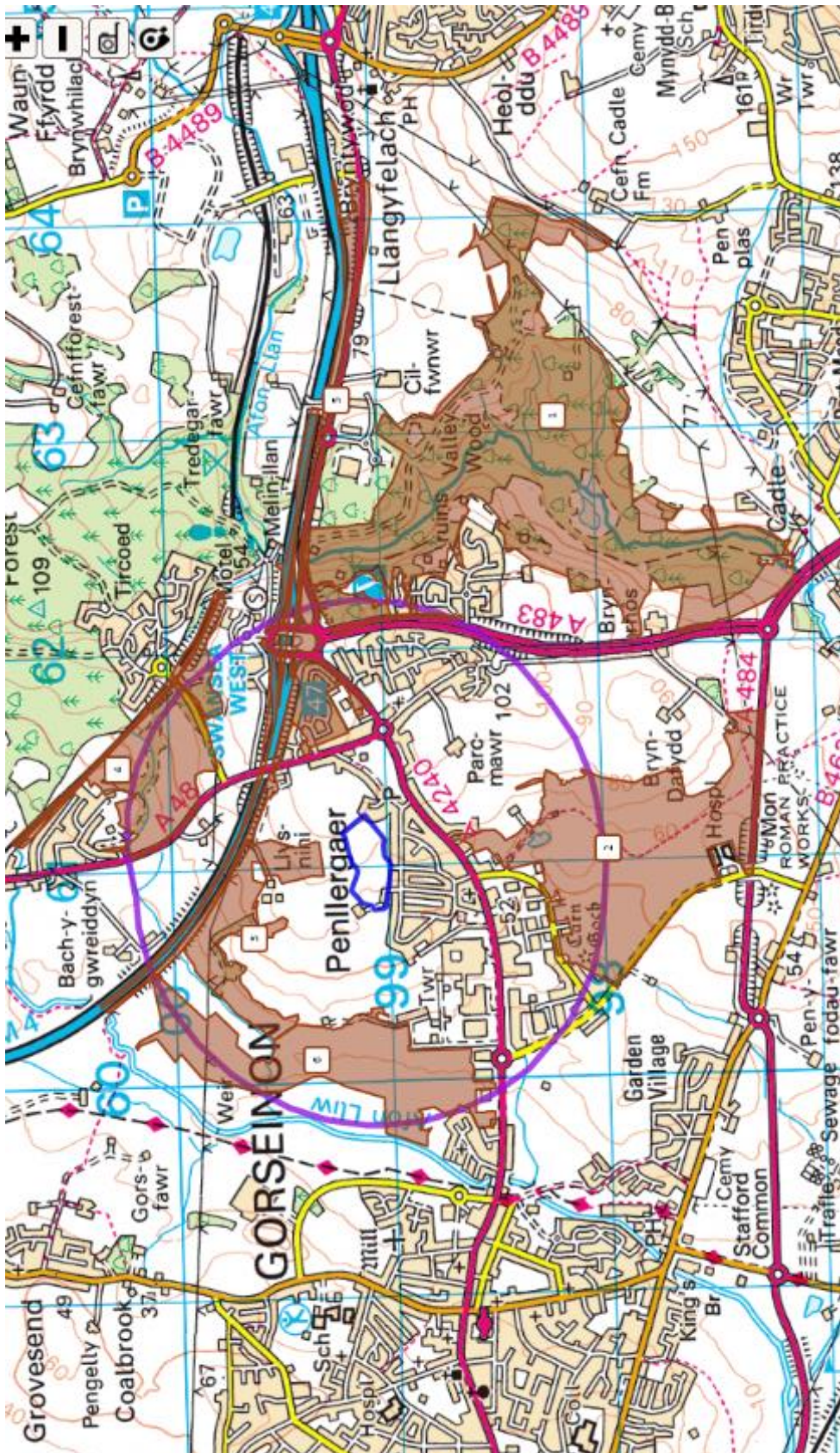


Plan 3: Site Location and Protected Sites (2km Buffer)



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Plan 4: SINC's (1km Buffer)

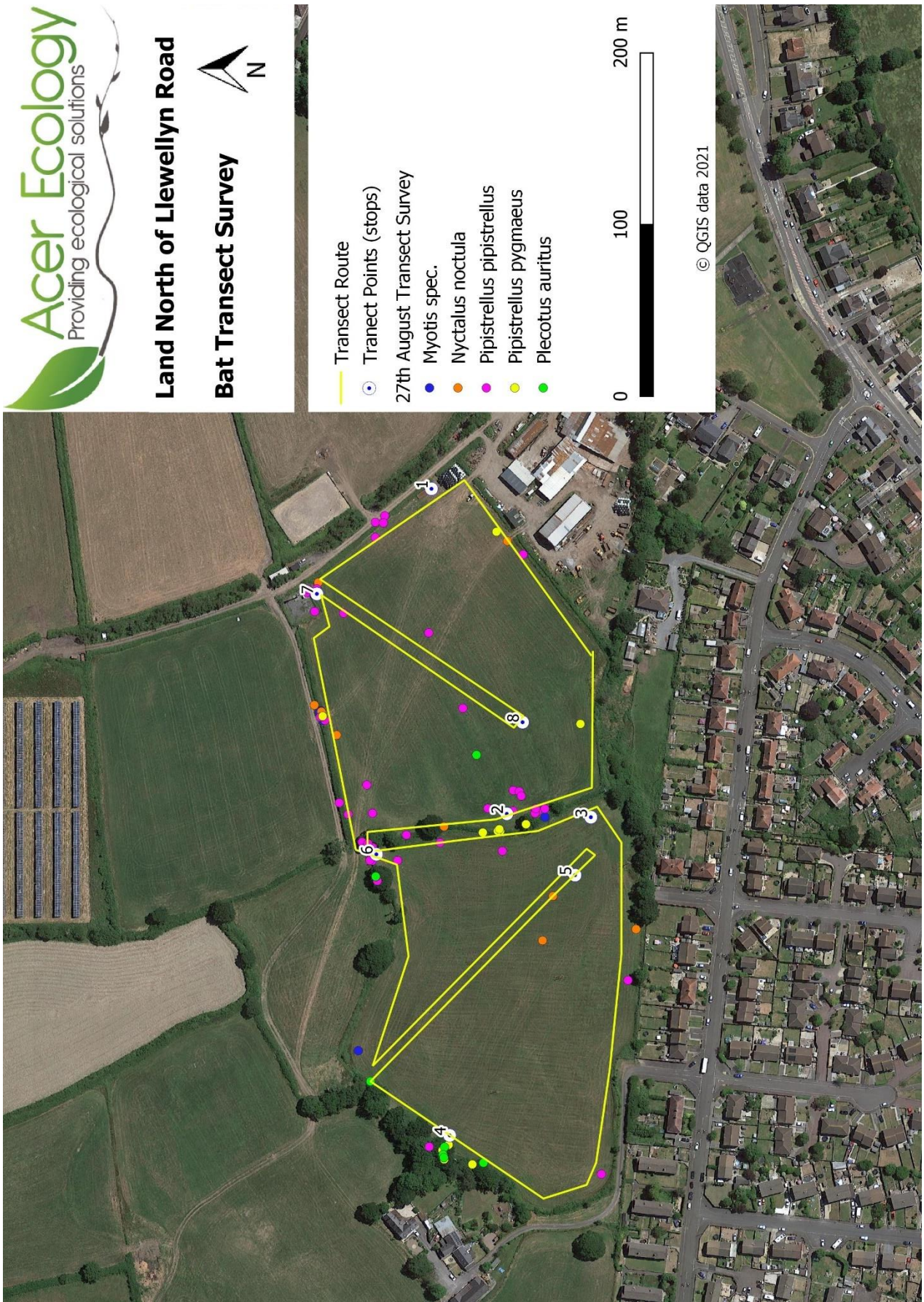


Note: SINC's highlighted in mauve. Data from SEWBReC (2020)

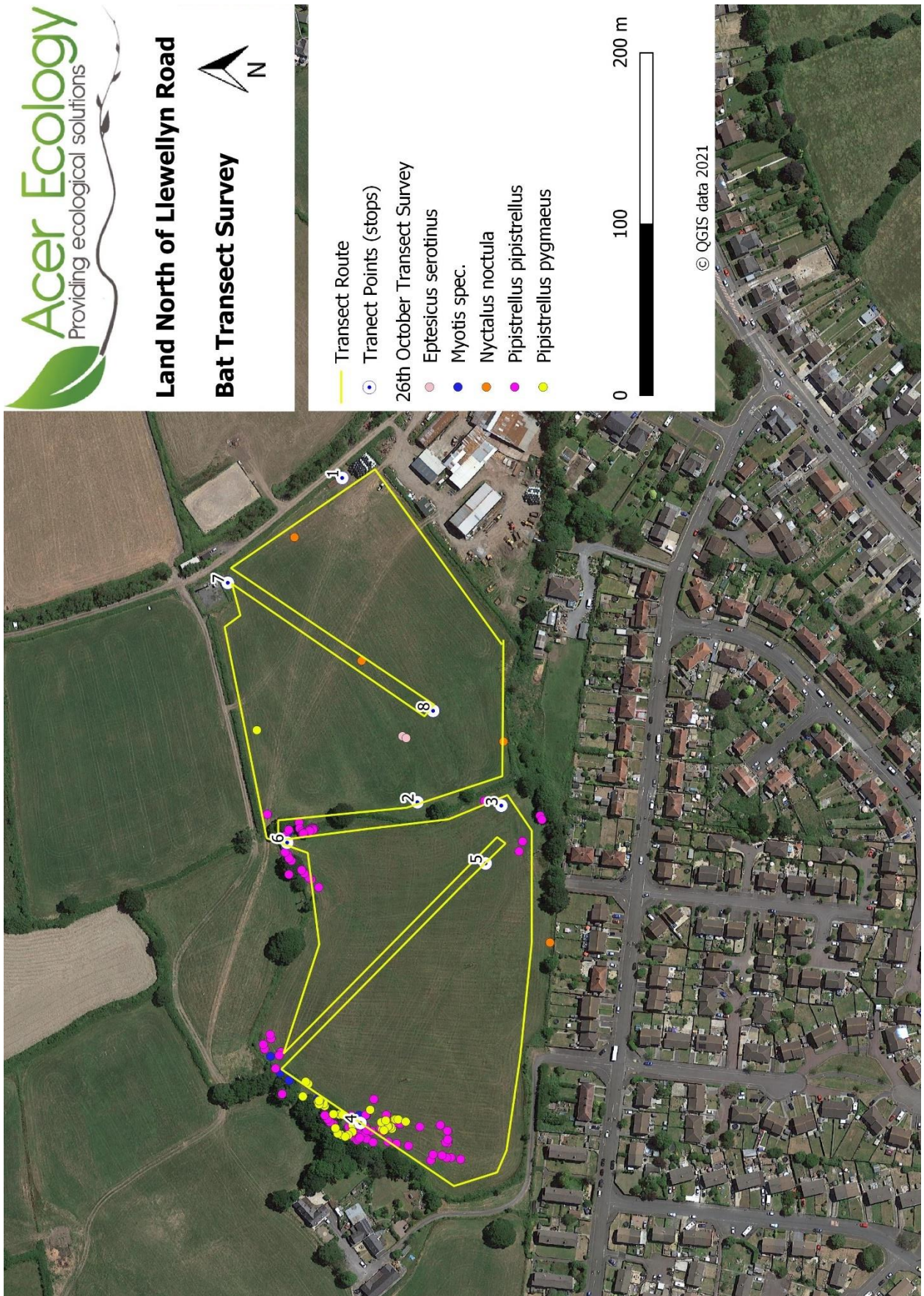
Plan 5: Habitats and Vegetation



Plan 6A: Transect Survey Results (August)



Plan 6B: Transect Survey Results (October)



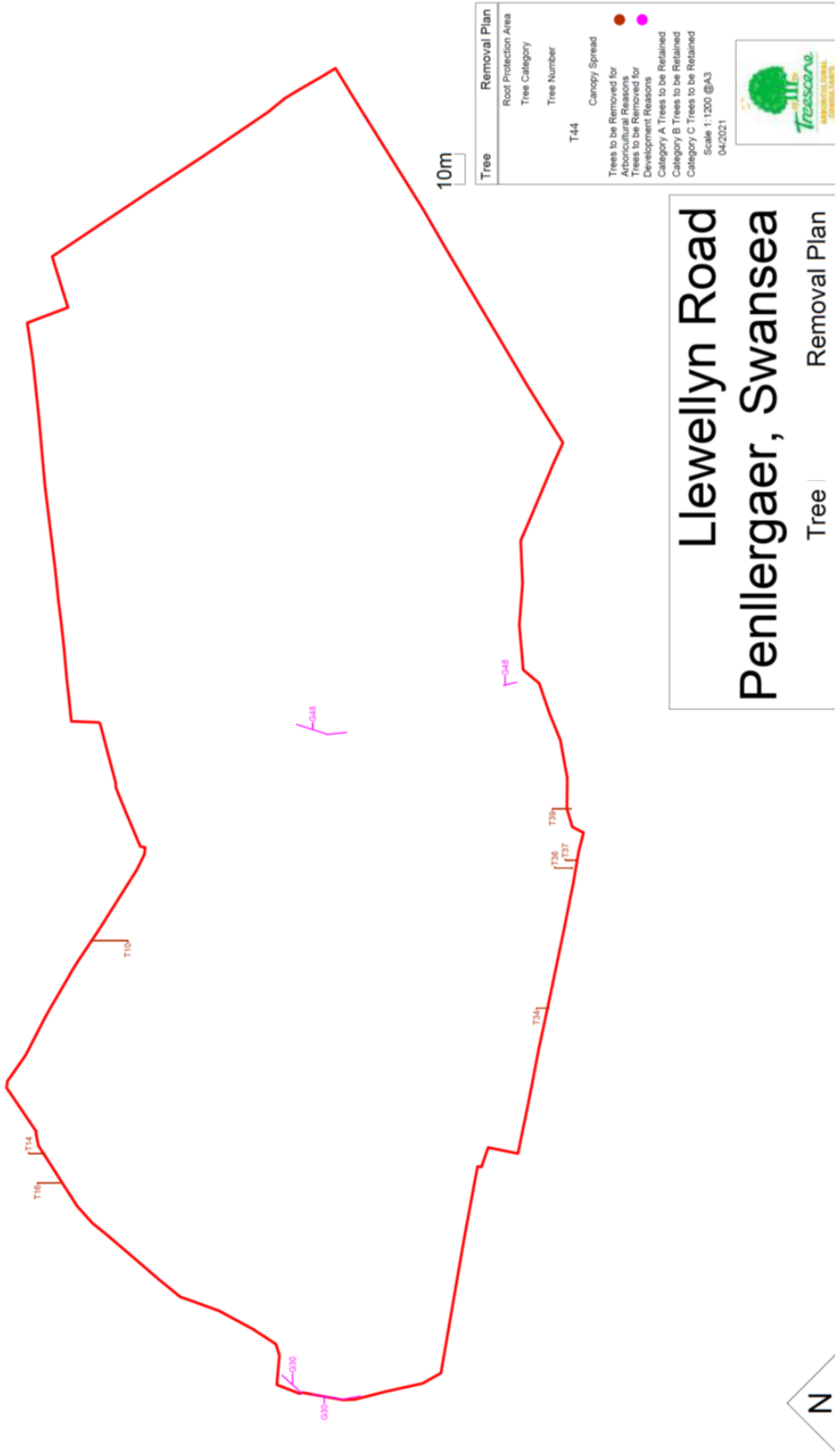
Plan 6C: Static Detector Locations



Plan 7: Hedgerow Numbers



Plan 8: Tree Removal Plan



Appendix 1: Development Proposals

House type	No of Beds	Total
Open Market		
Kinley	2	48
Maldstone	3	30
Moreaby	3	2
Kingville	4	22
Emmerdale	3	11
Chester	4	19
Hesketh	4	7
Alderney	4	11
Ridleigh	4	16
Andover	3	5
		171
Affordable		
Larch	3	1
Alder	1	4
Olive	2	3
Beech	3	1
		9
		TOTAL
		180



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

SACs

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

Development proposals within 10km of an SAC must be subject to Habitats Regulations Assessment's (HRA). If the LPA determine that a significant effect is likely, then it will be necessary to undertake an Appropriate Assessment³².

SSSIs

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

SINCs

SINCs are one of a class of nature conservation designations collectively referred to as 'Wildlife Sites'. Wildlife Sites are so-called 'third tier' sites, generally ranked below sites which are of international (first tier) or national (second tier) biodiversity significance, but which are considered to have substantive nature conservation value at the regional or district level. They are usually designated at the county or county borough level by the relevant local planning authority, and are recognised as a planning constraint in the relevant statutory development plan.

The framework for the identification and designation of 'Wildlife Sites' is set out in various Government documents, and is referred to in *Planning Policy Wales (2016) and Technical Advice Note (Wales) 5: Nature Conservation & Planning*.

In Swansea County Borough, SINCs are also afforded protection under Policy EV28 of the Unitary Development Plan.

³² For more information, consult 'Assessing Projects Under the Habitats Directive' David Tyldesley (2011) for CCW

ASNW and Woodland

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

The Welsh Assembly has recognised that areas of ancient woodland are declining and becoming increasingly fragmented and emphasises the importance of conserving ancient woodland and its value as a biodiversity resource through the publication of Planning Policy Wales (2016).

Paragraph 5.2.9 states: "Trees, woodlands and hedgerows are of great importance, both as wildlife habitats and in terms of their contribution to landscape character and beauty. They also play a role in tackling climate change by trapping carbon and can provide a sustainable energy source. Local planning authorities should seek to protect trees, groups of trees and areas of woodland where they have natural heritage value or contribute to the character or amenity of a particular locality. Ancient and semi-natural woodlands are irreplaceable habitats of high biodiversity value which should be protected from development that would result in significant damage."

Paragraph 5.2.10: "Local planning authorities should, as appropriate, make full use of their powers to protect and plant trees to maintain and improve the appearance of the countryside and built up areas."

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

Environment (Wales) Act 2016

The Environment (Wales) Act Section 6 duty, or the Biodiversity Duty, requires that public authorities must seek to maintain and enhance biodiversity so far as consistent with the proper exercise of their functions and in so doing promote the resilience of ecosystems. In fulfilling this duty, planning authorities must have regard to the list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016.

The Section 6 duty requires that developments should not be permitted which result in net loss of value to biodiversity, and must seek to achieve biodiversity net gain. Where net loss cannot be achieved through avoidance or mitigation, compensation is required but it should be noted that ancient woodland cannot be compensated for.

National Planning Policy Wales (2021)

The primary objective of PPW is to ensure the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of

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Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation.

Planning Policy Wales (PPW) Edition 11 - 24th Feb 2021 states that planning authorities must follow a stepwise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for; enhancement must be secured wherever possible. The first priority for planning authorities is 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 gain have been fully considered.

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Appendix 3: Guidelines for Assessing Potential Suitability of Proposed Development Site for Roosting, Commuting and Foraging Bats

Suitability	Description of Roosting Habitat	Commuting and Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting and foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection appropriate conditions³³ 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 hibernation³⁴.</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground³⁵.</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A tree with one or more PRFs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only). The assessments in this table are made irrespective of conservation status, which is established after presence is confirmed.	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	<p>Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

³³ For example, in terms of temperature, humidity, height above ground levels, light levels or levels of disturbance.

³⁴ Evidence from the Netherlands, shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for large numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

³⁵ This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Appendix 4: Definitions of Site Value

International Value

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

National Value

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

Regional Value

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

County Value/District Value

Site identified as a Site of Importance to Nature Conservation (SINC) at the district level; meeting South Wales Wildlife Sites Partnership (SWWSP) 2004 published designation criteria, but falling short of SSSI designation criteria, whether designated as a SINC or not. Ancient woodlands and sites supporting regionally significant areas of UK BAP habitat. Large scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/ LBAP or threatened species (other than badger).

High Local

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

Local Value

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

Site Value (within the immediate zone of influence)

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

Negligible

No apparent nature conservation value.

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Appendix 5: Species Recorded

All species recorded by Acer Ecology, 2020.

Taxonomic Name	Common name	W	LM	CG	LDA	PMR	PIL	TF	Status
Trees and Shrubs									
<i>Acer campestre</i>	Field maple	W							
<i>Acer pseudoplatanus</i>	Sycamore								Alien
<i>Betula pendula</i>	Silver birch								
<i>Corylus avellana</i>	Hazel								
<i>Crataegus monogyna</i>	Common hawthorn								
<i>Fagus sylvatica</i>	Beech								
<i>Fraxinus excelsior</i>	Ash								
<i>Ilex aquifolium</i>	Holly								
<i>Lonicera periclymenum</i>	Honeysuckle								
<i>Prunus spinosa</i>	Blackthorn								
<i>Quercus petraea</i>	Sessile oak	W							
<i>Quercus robur</i>	Pedunculate oak								
<i>Rosa arvensis</i> agg	Field-rose								
<i>Rosa canina</i> agg	Dog-rose								
<i>Rubus fruticosus</i> agg.	Bramble								
<i>Salix cinerea</i>	Grey willow								
<i>Salix</i> spp.	Willow sp.								
<i>Taxus baccata</i>	Yew	W							
<i>Ulex europaeus</i>	Common gorse								
Herbaceous Plants									
<i>Agrostis stolonifera</i>	Creeping bent								
<i>Alopecurus pratensis</i>	Meadow foxtail								
<i>Anisantha sterilis</i>	Barren brome								
<i>Asplenium scolopendrium</i>	Hart's-tongue fern								
<i>Bellis perennis</i>	Daisy								
<i>Cardamine pratensis</i>	Cuckooflower		LM			PMR			
<i>Cerastium fontanum</i>	Common mouse-ear								
<i>Cirsium arvense</i>	Creeping thistle								
<i>Cirsium palustre</i>	Marsh thistle								
<i>Cynosurus cristatus</i>	Crested dog's-tail								
<i>Dactylis glomerata</i>	Cock's-foot								
<i>Epilobium montanum</i>	Broad-leaved willowherb								
<i>Epilobium</i> sp.	Willowherb species								
<i>Festuca rubra</i>	Red fescue								
<i>Gnaphalium uliginosum</i>	Marsh cudweed						PIL		
<i>Hedera helix</i>	Ivy								
<i>Holcus lanatus</i>	Yorkshire fog								
<i>Juncus acutiflorus</i>	Sharp-flowered rush					PMR			
<i>Juncus effusus</i>	Soft rush								
<i>Lolium perenne</i>	Perennial rye-grass								
<i>Oenanthe crocata</i>	Hemlock water-dropwort					PMR			
<i>Persicaria maculosa</i>	Redshank								
<i>Phleum pratense</i>	Timothy grass								
<i>Plantago lanceolata</i>	Ribwort plantain								
<i>Plantago major</i>	Greater plantain								
<i>Poa annua</i>	Annual meadow-grass								
<i>Poa trivialis</i>	Rough meadow-grass								
<i>Potentilla reptans</i>	Creeping cinquefoil								

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<i>Prunella vulgaris</i>	Self-heal								
<i>Pteridium aquilinum</i>	Bracken								
<i>Pulicaria dysenterica</i>	Common fleabane					PMR			
<i>Ranunculus acris</i>	Meadow buttercup								
<i>Ranunculus repens</i>	Creeping buttercup								
<i>Rumex obtusifolius</i>	Broad-leaved dock								
<i>Schedonorus pratensis</i>	Meadow fescue		LM						
<i>Taraxacum officinale</i> agg.	Dandelion								
<i>Trifolium pratense</i>	Red clover		LM						
<i>Trifolium repens</i>	White clover								
<i>Urtica dioica</i>	Common nettle								
<i>Vicia cracca</i>	Tufted vetch		LM						

Key to Indicator Species (Wales Biodiversity Partnership 2008)

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

SINC Selection





Sites which support one primary species or five contributory species; or habitats which support eight Lowland meadow, eight calcareous grassland, seven Lowland dry acid grassland, twelve purple moor-grass and rush pasture or eight tillage field and margins indicator species, should be considered for SINC selection. Post-industrial sites supporting 20 or more indicator species from the combined post-industrial land, acid, neutral, calcareous and marshy grassland lists should be also considered for selection.

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Appendix 6: Trees, Target Note Numbers and PRFs

Target Note Number	Photo of Tree	Potential Roost Features
Field 1		
TN02		None
TN05		Dense ivy 
TN06		Dense ivy near base
TN07		Ivy







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		 <p>Gaps in broken branch</p> 
TN08		Ivy
TN09		Dense ivy




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TN10		Some ivy
TN11		None
Field 2		
TN12		None observed





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TN13		
TN14 and TN15		<p>Woodpecker-like hole in main trunk of TN14</p> 
TN16		<p>Dense ivy</p>  <p>Gaps in broken branches</p> 







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<p>TN17</p>		<p>Some ivy coverage and lifted bark</p> 
<p>TN18</p>		<p>Some lifted bark and hole in trunk (see red circle in main photo)</p>
<p>TN19 and TN20</p>		<p>None</p>







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TN21		<p>Dense ivy</p> 
TN22		<p>None observed</p>
TN23		<p>Exposed and lifted bark</p>






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<p>TN24</p>		<p>None</p>
<p>TN26</p>		<p>Lifted bark and broken branches</p>  <p>Gaps between overlapping branches</p>  <p>Hole in main trunk approximately 1.76m off the ground</p>

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<p>TN27</p>		<p>Holes in trunk</p>  <p>Gaps in broken branches</p> 
<p>TN28</p>		<p>Gaps between overlapping branches</p> 
<p>TN29</p>		<p>Gaps in broken branches and holes in trunk</p>





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<p>TN30 (contains defunct birds nest)</p>		<p>Lifted bark</p>  <p>Broken branch</p>  <p>Couldn't access to see properly</p>
<p>TN31</p>		<p>Holes</p>




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<p>TN32 and TN33</p>		<p>Broken branches</p>   <p>Hole in a branch</p> 
<p>TN34</p>		<p>None</p>





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<p>TN35</p>		<p>Broken branches</p>  <p>Dense ivy coverage</p> 
<p>TN36</p>		<p>None</p>

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<p>TN37 (mature oak – red arrow) and TN38 (young oaks surrounding TN37)</p>		<p>Could not access TN37 to see properly None in TN38</p>
<p>TN39</p>		<p>None</p>
<p>TN40</p>		<p>None</p>





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TN42		None
TN43		None
TN44 and TN45		None

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TN46		None
TN48		None
TN49		<p>Hole under branch</p>  <p>Gaps under broken branches</p>

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TN51		None
TN52		Dense ivy
TN53		None observed, hard to access

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TN54		None
TN55		None

Appendix 7: Recommended Number of Bat Activity Surveys to Achieve a Reasonable Survey Effort in Relation to Habitat Suitability (Collins 2016)

Survey Type	Negligible Suitability Habitat for Bats	Low Suitability Habitat for Bats	Moderate Suitability Habitat for Bats	High Suitability Habitat for Bats
Transect/ Spot County/ Timed Search Surveys	No survey required.	One survey visit per season (Spring – April/ May, Summer – June/ July/ August – Autumn – September/ October) in inappropriate weather conditions for bats. Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone.	One survey visit per month (April to October) in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.	Up to two survey visits per month (April to October) in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.
AND				
Automated/ Static Bat Detector Surveys	None required.	One location per transect, data to be collected on five consecutive nights per season (Spring – April/ May, Summer – June/ July/ August – Autumn – September/ October) in appropriate weather conditions for bats.	Two locations per transect, data to be collected on five consecutive nights per month (April to October) in appropriate weather conditions for bats.	Three locations per transect, data to be collected on five consecutive nights per month (April to October) in appropriate weather conditions for bats.

Appendix 8: Soft Felling of Trees

Trees considered to have potential to support roosting bats due to the presence of, for example, gaps within broken branches, knots and woodpecker holes, therefore require soft felling. 'Soft felling', is a generic term used to describe more cautious felling approaches, using lowering and cushioning techniques to reduce the impact of felling limbs/ivy growth which may still have bats within cavities:

- Works to the tree will take place between October and February³⁶ to coincide with the period of lowest bat activity and likelihood of bats being present. This timescale would also eliminate the risk of causing accidental harm to nesting birds;
- Tree surgeons undertaking felling works will be warned of the possible presence of roosting bats (and/or nesting birds), and of their protected status. It will be clearly understood that in the event of any bats (or occupied birds' nests) being found the contractor must halt works in the area surrounding the roost (i.e. at least 15m from the identified roost) and advice sought from Acer Ecology Ltd;
- Any hollow sections of any tree, or any limbs with cavities etc, will be severed above and below the cavity, taking care not to cut through any potential cavities or hollows, and lowered to the ground with minimal force using rope slings. This technique will be employed if the trees are subsequently found to have large cavities or split limbs;
- Any removed hollow sections which cannot be fully examined for bats will be removed to a shaded location and left undisturbed on the ground in a safe condition for 24 hours. This will allow any bats present to rouse themselves and fly off after nightfall. The sections will be positioned on the ground so that access to the cavities is unobstructed, but so that the cavities will not become filled with rainwater; and
- The services of an appropriately qualified and licensed bat consultant will be available on an 'on-call' basis at all stages of the works to deal with any unexpected encounters with bats or nesting birds.

³⁶ If the tree is assessed as having potential for hibernating bats mid-September to October or March may be a more appropriate timescale.

Appendix 9: Examples of Closed and Open Fronted Nest Boxes

An equivalent model may be installed on site.

Schwegler Bird Home 1MR



This nest box is for installation on external walls of buildings (including sheds and garages) and is suitable for a range of bird species. With a 32mm hole it allows entry to species such as coal tit, blue tit, great tit, redstart, nuthatch, house sparrow, tree sparrow and other species.

The recommended height is between 1.5m and 5m above ground with a south-east to south-west orientation.

Cleaning after the breeding season (wait until October) is advised to provide a clean nest for the following year, or utilisation by non-migratory birds for winter roosting.

Schwegler 2H Half Box



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

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

Correctly positioned it can attract species such as black redstart, pied wagtail, grey spotted flycatcher, and occasionally robin and wren.

The front panel is easily removed to facilitate cleaning.

Vivara Barcelona WoodStone Open Nest Box



These attractive nestboxes are manufactured from WoodStone which is a mix of concrete and FSC certified wood fibres. Unlike a traditional wooden nest box, these boxes will not rot away or deteriorate and are guaranteed for 10 years. This robust material safeguards against attacks from predators such as woodpeckers, cats and squirrels, whilst also providing a well-insulated interior with a more consistent internal temperature than an ordinary wooden box. This is especially important during the breeding season and ensures that young birds have a greater chance of survival. Nesting sites have become rare for cavity nesting birds due to changes in woodland management practices, so you can provide much-needed space for rearing chicks and birds that are roosting overwinter with these durable, long-lasting nest boxes.

These open nest boxes are suitable for wrens, robins, spotted flycatchers, pied and grey wagtails, song thrushes and blackbirds, and they are available in brown, green or grey to complement both natural woodland and garden settings.

The best height for your nest box is between 1.5m and 3m high, and open nest boxes should be sited in undergrowth such as ivy to provide cover for the nest.

These nest boxes have a removable front panel for easy cleaning. Although birds will clean their own nest boxes before each breeding season, cleaning the boxes out at the end of each breeding season may encourage them to be used again in future years, as it reduces parasites. The nesting time of birds varies from species to species so we suggest you wait until October when the last of the birds will have left before cleaning. The nest may come out easily but if there are any deposits scrape them out. We recommend using hot water rather than chemicals to remove any parasites that remain.

Specification

- * Width: 19cm
- * Height: 24cm
- * Length: 17.5cm

Appendix 10: Schwegler 1B General Small Bird Box, 26mm Entrance Hole

An equivalent model may be installed on site.

Nest Box 1B

Material: SCHWEGLER wood-concrete



Great Tit

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

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

Available entrance hole sizes:

Ø 32 mm, Ø 26 mm and Oval 29 x 55 mm

Suitable for the following species:

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

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

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



Clutch of Great Tit eggs



From a branch (Fig. 2)

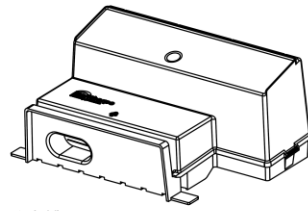
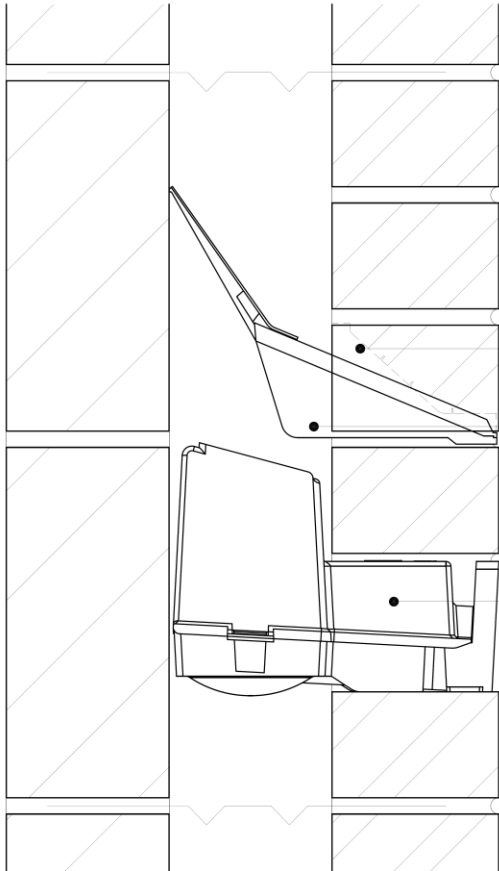


On the trunk, using Aluminium Nail (Fig. 1)

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

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

Appendix 11: Barratts/David Wilson Swift Box





Isometric View

Weep holes to be provided over opening, spaced at maximum 450mm centres. Minimum 2 number per opening.

Proprietary cavity tray with stop ends fitted directly above the swift box.

Manthorpe Swift box. Front edge of box to sit directly on top of brickwork with a skim of mortar on the back edge of the brick. The top and side section should have a mortar skim. The two tabs on the outside edges of the front element should lock beneath the adjacent brickwork. Swift box to be located above the ceiling insulation, high on the gable.

 DAVID WILSON HOMES	
 BARRATT DEVELOPMENTS PLC	
Date:	
Rev:	Description:
Rev:	Description:
Brand:	BARRATT / DAVID WILSON HOMES
Range:	-5 / 2010 CLASSIC
Title:	Swift Box
Detail No.:	DB-SD11-001
Drawn:	GOT
Scale:	1:2
Date:	Apr 16
Checked:	GOT

EXTERNAL REFERENCE :