Land at Greenhill

Caehopkin

Preliminary Ecological Appraisal

June 2022

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Document Verification Table

Greenhill, Caehopkin Preliminary Ecological Appraisal				
Revision	Date	Prepared by	Checked by	Verified by
1.0	09 May 2022	Emma Jones	Rory Jones MCIEEM	Paul Hudson MCIEEM
2.0	10 June 2022	Emma Jones	Ffion Jones	Paul Hudson MCIEEM
3.0	22 June 2022	Emma Jones Assistant Ecologist	Paul Hudson MCIEEM Principal Ecologist	Paul Hudson MCIEEM Principal Ecologist

Summary

Brief and Site Location	Acer Ecology Ltd. were instructed by Van Ellen and Sheryn Chartered Architects to conduct a preliminary ecological appraisal of land at Greenhill, Station Road, Caehopkin, Swansea, SA9 1TP within the boundary of Powys County Council (Ordnance Survey Grid Reference centred at: SN 82454 12125).
Development Proposals	The proposed development works comprise the clearance of the site to facilitate the construction of two residential properties.
Impacts to Key Receptors	No habitats on site are of greater than site value. Whilst the loss of the on-site habitats would be unlikely to have a significant impact outside of the context of the site, it would nevertheless be desirable that the impacts be either minimised or appropriately mitigated where possible. In addition, the proposed development could potentially have adverse impacts of varying degrees on a range of legally protected species, including common reptiles, nesting birds, dormice, hedgehogs, otters and commuting and foraging bats. Provided further work and appropriate precautionary and mitigation measures as detailed in Section 4 are implemented, the development is not anticipated to result in adverse impacts to any protected sites, habitats and species.
Invasive Species	The development may result in the spread of Japanese knotweed, an invasive plant species. Measures to prevent this are set out in Section 4.
Further Surveys	Further surveys are recommended so that the potential for adverse impacts can be established.
Recommendations	The following provisional recommendations have been developed based on the development proposals available at the time of writing. They may be subject to change upon receipt of the final design: Further Work: Japanese knotweed eradication strategy and the production of a Construction Environmental Management Plan; Precautionary measures – Pollution prevention measures; Vegetation clearance for birds and reptiles; Retention and protection of trees and stone wall; Species deterrence for dormice and GCN; Method statement production for reptiles (conditioned as part of the planning consent) and Good construction practices for mammals; Mitigation measures – Sensitive lighting strategy for bats and dormice; and Compensation and enhancement measures – Nesting bird enhancement; Bat boxes; Native landscaping; Hedgehog habitat management and SuDs.
Conclusions	The full extent of ecological impacts and potential constraints of the proposed development cannot be fully determined, based on the results of the preliminary ecological appraisal survey alone. Further survey work will be required before such assessments can be comprehensively made. At this stage, the site's ecological value is not considered to represent a fundamental in-principal constraint to the proposed development. 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), (CIEEM, 2019) and BS 42020:2013, to determine if conditions have changed since those described in this report.

1. Introduction

1.1. Brief and Site Location

Acer Ecology Ltd. were instructed by Van Ellen and Sheryn Chartered Architects to conduct a preliminary ecological appraisal of land at Greenhill, Station Road, Caehopkin, Swansea, SA9 1TP, within the boundary of Powys County Council (Ordnance Survey Grid Reference centred at: SN 82454 12125)[1]. The assessment documents the baseline ecological condition of the survey area, which is shown by the red line boundary on Plan 1. Designated sites, habitats, protected and notable species of conservation interest that could be affected by the proposed works are identified, and subsequent recommendations provided.

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 is located 0.3km south of Caehopkin town and measures approximately 0.12ha. The site mainly comprises recently cleared scrub, poor semi-improved grassland and patches of bare ground with mixed trees along the western border of the site. Ancient woodland immediately borders the east, with further mixed woodland bordering the south and west of the site. Residential housing lies to the north. The wider landscape is rural in all directions mostly comprising woodland, agricultural fields and multiple streams, with the Brecon Beacons National Park situated 0.39km to the northeast. Two watercourses lie to the north and south of the site within one kilometre and Nant Helen mine is located 0.6km south of the site. The site is characterised by a north-south sloped topography and sits approximately 0.2km above sea level.

1.3. Proposed Works

The proposed development works comprise the clearance of the site to facilitate the construction of two residential properties.

Precise details of the development are unavailable at the time of writing.

1.4. Scope of the Study

The study comprised the following:

A desk study to identify existing information on statutory and non-statutory sites of nature conservation interest, and records of notable or protected habitats or species within the site and its environs;

A Phase 1 Habitat Survey of the site, extended to search for evidence of, and potential for, protected fauna; and

[1] Latitude and Longitude: 51.79538720633672 , -3.7058938845997536/ what3words: stop.hazel.typical

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 baseline ecological information;

Provide an ecological evaluation of on-site habitats, including an assessment of the potential for protected species;

Assess the potential impacts of the development proposals on ecological receptors;

Assess the potential ecological constraints to the proposals; and

Provide recommendations for further survey, avoidance, mitigation and enhancement where appropriate.

2. Methods

The survey was undertaken following standard methods as derailed in the Chartered Institute of Ecology and Environmental Management (CIEEM) Preliminary Ecological Appraisal 2017 guidelines, and the Phase 1 Habitat Survey manual (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 and protected species was obtained from the sources detailed in Table 2. The legislation and policy relating to statutory and non-statutory designated sites can be found in Appendix 1. Plan 2 shows the protected sites in relation to the proposed development site.

Table 1: Summary of Designated Sites and Other Abbreviations

Abbreviations	
Site of Special Scientific Interest	SSSI
Ancient Semi-Natural Woodland	ASNW
Restored Ancient Woodland Site	RAWS
Plantation on Ancient Woodland Site	PAWS
Natural Resources Wales	NRW
Natural England	NE
Biodiversity Information Service	BIS

Table 2: Sources of Data

Source	Data	Radius of Search
NRW Geographical Information Systems (GIS) Layers	Statutory and non-statutory nature conservation designated sites ASNW, RAWS and PAWS	Ramsar/SACs/SPAs/SSSIs/NNRs/LNRs – 2km[2] SACs (designated for bats) - 10km. 2km.
BIS	Protected species records (BIS unique reference: DERF 1929)	1km.

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

The protected species search of 1km is considered appropriate. Page 15 of CIEEM's Guidelines for Preliminary Ecological Appraisals states that 'Existing ecological information for the site and adjacent areas should extend to at least 1km from the site boundaries (or 0.5 km for sites of approximately 1 ha or less). The search for desk study information will need to extend further beyond the site boundaries to ensure that all information of relevance to the assessment has been collected. In this instance a 1km data search for protected species is considered appropriate.

[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 BIS data. The presence of off-site features and habitats, which add to the ecological value within the wider area (for example, ponds within 0.5km of the site) were identified. Where appropriate, such features were scoped into the detailed assessment of impacts presented in Section 3.

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 Powys County Council Planning Portal[3] was consulted to determine if any previous survey information was available for the site, or immediate surroundings.

An internet-based search of the Powys Biodiversity Action Plan[4] was undertaken.

2.2. Field Study

2.2.1. Personnel

The field survey was undertaken in good weather on the 8th April 2022 by Emma Jones[5] and Ffion Jones[6].

2.2.2. Vegetation and Habitats

The vegetation and habitat types present within the survey area were categorised and mapped in accordance with the standard[7] Phase 1 Habitat assessment methodology (Joint Nature Conservation Committee, 2010), dominant and conspicuous plant species were recorded for each habitat. Target notes were used to record information on features of ecological interest, such as evidence of, or habitats with potential to support protected species or where any features of interest too small to map were recorded. 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 3).

[3] https://pa.powys.gov.uk/online-applications/simpleSearchResults.do?action=firstPage
[4] https://en.powys.gov.uk/article/2553/Local-Biodiversity-Action-Plan
5 Emma graduated in Marine Biology and Coastal Ecology with first class honours from the University of Plymouth. She is currently receiving training from Acer Ecology, working as an Assistant Ecologist, gaining ecological surveying experience. She is listed as an accredited agent on Paul Hudson's bat licence (S088190/8).
[6] Ffion graduated with a degree in Ecology and Conservation from the University of Exeter during which she studied modules on biodiversity, ecological consultancy, and conservation. She is an Assistant Ecologist with Acer Ecology working and has two seasons experience of bat survey work. She is listed as an accredited agent on Paul Hudson's bat (S088190/8) and dormouse (S089818/1) licences and has undergone training with Acer Ecology in habitat and protected species surveying. Further details of her qualifications and experience can be found at https://www.linkedin.com/in/ffion-jones-17ab63197.
[7] Some additional categories were also used if applicable e.g. hard standing and Japanese knotweed.

Section 7 habitats (Environment Wales Act 2016) and Priority Habitats of the UK Biodiversity Action Plan (BAP) (Biodiversity Reporting & Information Group, 2007) were identified and assessed to determine of the site meets the non-statutory designated site criteria (SINC).

Invasive plant species listed on Schedule 9[8] 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

Evidence of, and habitats with, potential to support protected or notable species were noted, 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 (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 relevant Local Biodiversity Action Plan (LBAP);
- Red Listed using International Union for the Conservation of Nature (IUCN) criteria (e.g. in one of the UK Species Status Project[9] reviews, in the Species of Conservation Concern Red, Amber or Near Threatened List[10], Birds of Conservation Concern in Wales[11], 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).

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).

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

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

Bats

Preliminary Ground-level Roost Assessment

A preliminary ground-level roost assessment of the trees within the survey area was undertaken, looking for features that bats could use for roosting (Potential Roost Features[12] (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 Error! Reference source not found.3.

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 5). A high-powered torch (Clulite), an endoscope (Snake vision), binoculars and a ladder were used as appropriate during the survey.

Buildings Assessment

There are no buildings present within the survey area, however, an assessment was carried out on the stone wall.

Terrestrial Habitat Assessment

A preliminary assessment of the value of the site for bats (and any potential roost sites therein) was made in accordance with Table 4.1 of the Bat Surveys for Professional Ecologists (Collins, 2016) (see Appendix 5). The assessment was based on the relative abundance and quality of habitat features within the site, and surrounding landscape, suitable for roosting, foraging and commuting bats.

Dormice

The scrub habitats were assessed for their suitability to support dormice (*Muscardinus avellanarius*). The structure and composition of the scrub within the site was 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.) and sycamore (*Acer pseudoplatanus*), as well as other trees and shrubs listed in the Dormouse Conservation Handbook (Bright,

[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.

Morris & Mitchell-Jones, 2006) as being of value to dormice. In addition, connectivity to other areas of suitable habitat in the wider landscape, such as hedgerows and woodland, was assessed.

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

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

Great Crested Newts

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

Ordnance Survey maps and aerial images of the land surrounding the site were consulted to determine if any water bodies were present within the site or within 0.5km of it. One potentially suitable water body was identified within the study area (see Plan 4).

Due to access constraints, an HSI assessment of this waterbody was not able to be undertaken. However, this is not considered to be a significant constraint to the overall assessment for GCN, due to the distance of the water body from the proposed development (420m) and the restricted ecological connectivity.

Pond 1 is separated from the proposed development site by a minor road. This is considered to act as a partial barrier to GCN migration (English Nature, 2001) therefore the likelihood of GCN migrating onto the proposed development site is considered to be low.

Otters

A preliminary assessment for signs of otter (*Lutra lutra*) was undertaken following the advice provided by Strachan & Jefferies (1996) and Chanin (2003). Where access was available, the banks of the stream 20m south of the survey area was searched for evidence of otter activity within 10m of the bank. Field signs of otter were recorded if present including spraints (faeces showing food remains), footprints, feeding remains and couches (above ground resting sites normally in thick vegetation cover), as well as potential or actual breeding sites and resting places (i.e. holts or natal dens) which are usually found under roots of bank side trees or in rock piles.

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

Water Voles

An assessment of the stream 20m south of the survey area was undertaken to determine its suitability for supporting water voles (*Arvicola amphibius*), following methods set out in the Water Vole Conservation Handbook (Strachan & Moorhouse, 2006). In addition, a search for evidence of activity was undertaken, including droppings, latrines, burrows, footprints and feeding lawns, of any areas considered suitable. Due

to the lack of suitable vegeation along the banks of the stream and lack of evidence, it is considered there is negligible potential for water voles to occur on site.

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

White-Clawed Crayfish

An assessment of the stream 20m south of the survey area was undertaken to determine its suitability to support white-clawed crayfish (*Austropotamobius pallipes*) (WCC), based on the habitat requirements set out in the Ecology of the White-Clawed Crayfish Handbook (Holdich, 2003). Specifically, the presence of undermined/overhanging banks, soft banks for burrows, cobble and rock substrate, submerged refugia and macrophytes.

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

Badgers

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

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

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 helvetica*); 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.

Harvest Mice

The terrestrial habitats on site were appraised for their potential to support harvest mice (*Micromys minutus).* Particular attention was paid to features superficially suitable for supporting this species, such

areas of tall grassland, rank field margins, cereal crops, hedgerows, and areas of rank or tussocky grassland.

Where areas of suitable habitat were identified, a search for the nests of harvest mice was undertaken to aid determination of their presence[13]. Any identified nests were left in-situ and not physically inspected.

A thorough harvest mouse survey was not undertaken, as this was beyond the scope of the assessment.

Other Species

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

2.2.4. Assessment of Ecological Value

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

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 4).

Restricted Access to Water Bodies Within 0.5km of Site

A pond within 0.5km of the site could not be accessed (420m). As a general rule, suitable habitats within 250m of a breeding pond are likely to be used most frequently by GCN (English Nature 2001). Given the lack of suitable waterbodies for GCN on site and a lack of records returned by BIS as part of the data search, this is not considered to be a significant survey constraint and it is considered unlikely to have altered the assessments made.

[13] A defined search methodology was not undertaken. Instead, suitable habitat features were searched on an ad-hoc basis.

3. Baseline Ecological Conditions, Evaluation and Development Impacts

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

A summary of relevant legislation and planning policies relating to protected sites, habitats and species is provided in Appendices 1 and 2.

3.1. Statutory Nature Conservation Designated Sites

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

No SACs or SSSIs specially designated for bats lie within 10km of the site.

RAMSARs, SPAs, SACs, SSSIs, NNRs, LNRs, National Parks and AONBs within 2km of Site

The proposed development site lies within 2km of the following statutory sites:

Table 4: Statutory Sites Designated Within 2km

Site Name	Designation	Description	Distance and Direction from Development Site	Development Impacts
Nant Llech[14]	SSSI	A range of woodland types has formed in response to variations in soil moisture content and soil chemistry. The bird life is rich and includes wood warbler, redstart and great spotted woodpecker. Dippers occur on the river and tributary streams. The invertebrate fauna awaits detailed study, but the uncommon soldier beetle (*Podabrus alpinus*) has been recorded from the wood.	1.1km to the west	No adverse impacts anticipated due to the distance from the site.
Brecon Beacons	National Park	National Parks are designated for their aesthetic and recreational value as opposed to wildlife value as well. However, they often contain habitats of high ecological value. The Brecon Beacons National Park comprises a rich mosaic of upland habitats and rolling valleys.	0.35km to the north	No adverse impacts are anticipated due to the distance from the site.

3.2. Non-statutory Nature Conservation Designated Sites

[14] https://naturalresources.wales/media/676915/sssi_0366_citation_en001.pdf

SINCs

There are no non-statutory sites designated for their conservation value within 2km of the site.

Ancient Woodland

There are 73 areas of ASNW located within 2km of the proposed development site, the nearest of which lies on the eastern border of the site. The nearest site likely to be affected by the development is an unnamed area of ASNW.

3.3. Site History

The site proposed for development was unclassified during the previous Phase 1 habitat survey of Wales.

3.4. Habitats and Vegetation

The results of the general survey of habitats and vegetation are shown on Plan 3. A botanical species list is provided in Appendix 3.

The site consists of eight elements which are described in detail overleaf.

	Table 6: Habitats Recorded on Site			
Habitat (Phase 1)	Habitat UK Habitats	Description	Ecological Value	Development Impacts
Dense Scrub (A2.1) and Scattered scrub (A2.2)	Heathland and shrub - Mixed scrub (h3)	The recently-cut scattered scrub to the east of the site (Photo 1) comprises dominant silver birch (*Betula pendula*) saplings, willow (*Salix* spp.), cherry laurel (*Prunus laurocerasus*), creeping buttercup (*Ranunculus repens*), cleavers (*Galium aparine*), common nettle (*Urtica dioica*), bulbous buttercup (*Ranunculus bulbosus*), square-stalked willowherb (*Epilobium tetragonum*), spear thistle (*Cirsium vulgare*), Yorkshire fog (*Holcus lanatus*), bramble (*Rubus fruticosus* agg.), curled dock (*Rumex crispus*), common sorrel (*Rumex acetosa*), hairy bittercress (*Cardamine hirsuta*), primrose (*Primula vulgaris*), wood sage (*Teucrium scorodonia*), hart's-tongue fern (*Asplenium scolopendrium*), ivy (*Hedera helix*) and soft rush (*Juncus effusus*). Denser scrub to the northeast of the site boundary (Photo 2) comprises frequent holly (*Ilex aquifolium*) and hawthorn (*Crataegus monogyna*) with occasional ivy. A stand of Japanese knotweed (*Fallopia japonica*) is present. Detailed tree descriptions are provided in Section 3.7.3.	Site value UK Habs medium distinctiveness.	Clearance of the site to facilitate the new development will result in the permanent loss of areas of this habitat; thereby resulting in the loss of potential refugia for sheltering wildlife, such as reptiles and mammals (see Sections 3.5.10 and 3.5.12).
Scattered Broadleaved and Coniferous Trees (A3.1 and A3.2)	Scattered trees (g(11))	The scattered broadleaved and coniferous trees bordering the southwest of the site boundary and continuing along the stone wall (Photos 3 and 4) comprise birch (*betula* spp.), Leyland cypress (x *Cuppressocyparis leylandii*), oak (*Quercus* spp.) cherry (*Prunus* sp.), field maple (*Acer campestre*), conifer sp., willow and wilson's honeysuckle (*Lonicera nitida*). Dogwood (*Cornus sanguinea*), bluebell (*Hyacinthoides non-scripta*), ivy, polypody (*Polypodium* sp.) and privet (*Ligustrum* sp.) are present in the understorey. Detailed tree descriptions are provided in Section 3.7.3.	Site value	The scattered trees are proposed for retention and no direct impact is anticipated, however inadvertent damage to this habitat could potentially occur during the construction phase of the development. Precautionary measures to prevent this are detailed in section 4.
Poor Semi-improved Grassland (B6)	Modified grassland (g4)	The central patch of semi-improved grassland (Photo 5) comprises abundant Cock's foot (*Dactylis glomerata*) and frequent ribwort plantain (*Plantago lanceolata*) and creeping buttercup. Occasional sorrel (*Rumex acetosa*), curled dock	Site value UK Habs low distinctiveness	Clearance of the site to facilitate the new development will result in the permanent loss of areas of this habitat; thereby resulting in the loss of potential refugia for

		(*Rumex crispus*), bird's foot trefoil (*Lotus corniculatus*), common ragwort (*Senecio jacobaea*), meadow vetchling (*Lathyrus pratensis*) and alder (*Alnus glutinosa*) are present. This habitat conforms to Modified Grassland in UK Habs.		sheltering wildlife, such as reptiles (see Sections 3.5.10 and 3.5.12).
Bare Ground (J.4)	Urban - Vacant/derelict land/ bare ground with low distinctiveness.	Two areas of bare ground are present in the northwest (Photo 6) and southwest (Photo 7) corners of the site. Occasional cock's foot, common sorrel, spear thistle and creeping buttercup are present. Both areas of bare ground contain multiple tree stumps, potentially providing reptile hibernacula (Photos 6 and 8)	Negligible value UK Habs very low distinctiveness.	Clearance of the site to facilitate the new development will result in the permanent loss of areas of this habitat; thereby resulting in the loss of potential refugia for sheltering wildlife, such as reptiles (see Sections 3.5.10 and 3.5.12).
Wall (J2.5)	Urban-Built Linear Features (u1e)	Two walls are present on-site (Photos 9 and 10). The first wall is comprised of stone and runs along the south-western boundary of the site and segregates the scattered trees from the northern patch of bare ground. Maidenhair spleenwort (*Asplenium trichomanes*), hart's-tongue fern and opposite leaved golden saxifrage (*Chrysosplenium oppositifolium*) grows within some of the walls' cracks. The second wall is comprised of bricks and sits in the south-eastern corner of the site.	Negligible Value. Uk Hab Very Low Distinctiveness	The stone wall is proposed for retention; therefore, no direct impact is anticipated. However inadvertent damage to the wall could potentially occur during the construction phase of the development, resulting in direct adverse impacts to roosting bats, if present, as well as the permanent loss of potential roosting sites. Recommendations to avoid and mitigate such impacts are presented in Section 4. Clearance of the brick wall to facilitate the new development will result in the permanent loss of areas of this habitat; thereby resulting in the loss of potential refugia for sheltering wildlife, such as reptiles (see Sections 3.5.10 and 3.5.12).
Earth bank (J2.8)	Earthbank (g(71))	A sloped earth bank borders the south of the site boundary (Photo 11). Occasional Yorkshire fog, square-stalked willowherb, common nettle (*Urtica dioica*) and common sorrel are present with sparse wood sage.	Site value	Clearance of the site to facilitate the new development will result in the permanent loss of areas of this habitat; thereby resulting in the loss of potential refugia for sheltering wildlife, such as reptiles (see Sections 3.5.10 and 3.5.12).
Fence (J3.4)	Urban-Built Linear Features (u1e)	Metal fencing (Photo 12) is present around the north, east and south of the site.	Negligible Value. Uk Hab Very Low Distinctiveness	The fence will most likely be removed.

Japanese Knotweed stand[15]	Tall herb (w16)	A small stand of Japanese knotweed is present to the northeast of the site (Photo 13).	Negligible value	Japanese knotweed will require eradication from the site. Detailed recommendations are provided in Section 4.

[15] Habitat not included within the Phase 1 Handbook (JNCC 2010)

Photo 1: Recently-cut scattered scrub

Photo 2: Dense scrub (northeast)

Photo 3: Scattered broadleaved and coniferous trees

Photo 4: Scattered broadleaved and coniferous trees

Photo 5: Semi-improved grassland

Photo 6: Bare ground and tree stumps (northwest)

Photo 7: Bare ground (southwest)

Photo 8: Southwest bare ground tree stump example

Photo 9: Stone wall (southwest)

Photo 10: Brick wall (southeast)

Photo 11: Earth bank

Photo 12: Metal fencing

Photo 13: Stand of Japanese knotweed

3.5. Invasive Plant Species

Details of the invasive species on site are described in detail below:

Species	Occurrence on Site	Legislation	Assessment of Potential Development Impacts
Japanese knotweed	A small stand of Japanese knotweed is present to the northeast of the site within the recently-felled scattered scrub.	Schedule 9 invasive plant. A non-native species that poses a conservation threat to native biodiversity and habitats, such that further releases should be regulated. This species has a negative effect on the biodiversity of the site.	Japanese knotweed will require eradication from the site. Detailed recommendations are provided in Section 4.

3.6. Assessment of Ecological Value of Off-site Habitats

Survey Results

A line of broadleaved trees (Photo 14) lie adjacent to the southern boundary of the site and a shallow un-named stream lies approximately 20m to the south of the site, running from the River Tawe.

Assessment of Development Impacts

The line of trees adjacent to the southern boundary of the site is proposed for retention and no direct impact is anticipated. However, inadvertent damage to the trees could potentially occur during the construction phase of the development. These trees could be subject to root damage as a result of heavy plant movement over the root protection area, or accidental damage during general construction activities. Recommendations to avoid and mitigate such impacts are presented in Section 4.

The proposed works could adversely affect the ecological integrity of the un-named stream via indirect impacts such as pollution or sediment deposits associated with construction works and site waste. These impacts may move downstream and thus affect areas beyond the immediate zone of influence. However,

such an occurrence can be adequately avoided by the implementation of pollution prevention measures, as set out in Section 4.

Photo 14: Line of broadleaved trees

3.7. Protected and Notable Species

3.7.1. Notable Plant Species

Data Trawl Results

BIS returned no records of protected plant species or species of principal importance listed under the Environment (Wales) Act 2016 from within 1km of the site proposed for development. However, three counts of Japanese Knotweed were recorded within 0.39km of the site, the nearest of which was 0.2km in 2020.

Field Survey Results

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

3.7.2. Birds

Desk Study Results

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

Species		Schedule 1	NERC S41 - (English Sites, species of principal importance	UK BAP	Red list[16]	Amber list[17]	Breeding Habitat[18]	Wintering Habitat
Hawfinch	*Coccothraustes coccothraustes*			Yes	Yes		Broadleaved woodland, extensive orchards, hedges and thickets	As breeding habitat
Meadow pipit	*Anthus pratensis*					Yes	Saltmarsh, flood meadow, chalk grassland, lowland heath, grazed fen and bog, uplands and young conifer plantations	Sewage works, wetland margins, saltmarsh, plough, rough pasture and crops
Swallow	*Hirundo rustica*						Lowland farmland, usually associated with buildings	N/A
Swift	*Apus apus*					Yes	Agricultural and urban habitats	N/A

[16] 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.

[17] 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.

[18] Breeding and wintering habitat descriptions from Key Habitat Attributes for Birds and Bird Assemblages in England Part 1 (ENRR359)

Field Survey Results

A moderate number of birds were recorded on site, including: blackbird (*Turdus merula*), blue tit (*Parus caeruleus*), bullfinch (*Pyrrhula pyrrhula*), buzzard (*Buteo buteo*), great tit (*Parus major*), jay (*Garrulus glandarius*) and long-tailed tit (*Aegithalos caudatus*).

An active blackbird nest with chicks (Photo 15) was recorded within a Leyland cypress (*x Cuppressocyparis leylandii*) tree that sits on the southwest of the site (T3, Plan 3), at approximately 2ft from ground level.

A defunct bird's nest (Photo 16) was recorded within a willow (*Salix* sp.) tree that sits in the centre of the eastern border of the site (T1, Plan 3), at a height of approximately 4m.

Photo 15: Active blackbird nest (T3)

Photo 16: Defunct birds' nest (T1)

Evaluation of Ecological Value of Site for Birds

Seven species were seen using the suitable habitats present within the site. An active blackbird nest with chicks was recorded within the scattered broadleaved and coniferous tree habitat to the southwest of the site. A bullfinch was also noted displaying nesting behaviour within the same habitat. Two buzzards and four jays were seen flying over the site and are likely to use the trees within the mixed and broadleaved woodland habitats off-site periodically, however, they are unlikely to use the site for nesting. The scattered tree and scrub habitats present within the survey area provide optimal habitat for tree and scrub nesting birds. Additionally, the dense scrub on the northwest boundary of the survey area contains the berry producing species hawthorn, which provides a valuable foraging resource.

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

Impact Assessment of Proposed Development on Birds

The following direct impacts to nesting birds may occur as a result of the development:

Death or injury to adults or destruction of nests during vegetation clearance.; and

Small-scale and permanent nesting habitat loss.

The following indirect impacts to nesting birds may occur as a result of the development:

Habitat degradation; and

Increases in disturbance levels.

However, the scattered tree habitat is proposed to be retained and such impacts can be avoided either via the retention of the dense and scattered scrub, or by timing works so that they occur outside of the nesting bird season (September to February inclusive), and by adopting sensitive working practices as detailed in Section 4.

3.7.3. Bats

Desk Study Results

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

Table 8: Bat Roost Records

Species	Total Number of Records	Distance to Nearest Record	Most Recent Record	Maximum Count
Noctule (*Nyctalus noctula*)	One	0.4km	2009	Not Specified
Pipistrelle bat species (*Pipistrellus sp.)*	One	0.4km	2009	Not Specified
Common pipistrelle (*Pipistrellus pipistrellus*)	One (maternity colony)	0.96km	2018	Not Specified
Brown Long-eared (*Plecotus auratus*)	One	0.96km	2018	Not Specified
Unidentified *Myotis* sp.	One	0.96km	2018	Not Specified
Soprano pipistrelle (*Pipistrellus pygmaeus*)	One	0.96km	2018	Not Specified
Common pipistrelle	Two	0.97km	2012	Three

There were no records of bat surveys having been previously undertaken on site on the Local Authority planning portal. The local bat group held no records of bats surveys having previously been undertaken of the site.

Field Survey Results

Trees

All of the trees within the survey area were assessed for their suitability to support roosting bats. The majority of the scattered trees were young in age with no PRFs. They were therefore assessed as having negligible bat roost potential and were scoped out of the assessment. They are therefore not mentioned further in this context in the report.

However, the trees marked T1-10 on Plan 3 supported a number of semi-mature to mature trees. These have been described in detail in the table below and numbered on Plan 3, which should be read in conjunction with this section of the report.

Table 10: Trees Assessed for Bat Potential

No.	Description	Evidence of Roosting Bats	PRF	Suitability for Roosting Bats
T1	Mature willow (Photo 17), single trunk. Approximately 15m in height. DBH 70cm.	None.	A broken branch at a height of 4m facing north (Photo 18). A broken branch at a height of 6m facing west (Photo 19). A broken branch at 5m facing north (Photo 20). Two knots at 6m facing north (Photo 21). A deep crevice at 7m facing west (Photo 22). A defunct bird's nest was also recorded (see section 3.7.2.).	High
T2	Semi-mature silver birch (Photo 23). Single trunk, approximately 8m in height with a DBH of 20cm	None.	Damaged bark but superficial and considered sub-optimal for bat roosting.	Negligible
T3	Semi-mature Leyland cypress (Photo 24). Single trunk, approximately 3m in height.	None.	No PRF's were identified. An active blackbird's nest was recorded (see section 3.7.2.).	Negligible
T4	Semi-mature oak (Photo 25). Single trunk, approximately 12m in height, a DBH of 60cm.	None.	A single north-facing knot-hole, approximately 5m in height (Photo 26).	Low
T5	Semi-mature field maple (Photo 27). Single trunk, approximately 10m in height with a DBH of 50cm.	None.	No PRF's were identified.	Negligible
T6	Semi-mature field maple (Photo 28). Single trunk, approximately 15m in height with a DBH of 30cm.	None.	No PRF's were identified from ground level however the tree is of sufficient age to contain higher level PRF's.	Low
T7	Semi-mature field maple (Photo 29). Single trunk, approximately 15m in height with a DBH of 30cm.	None.	No PRF's were identified from ground level however the tree is of sufficient age to contain higher level PRF's.	Low

No.	Description	Evidence of Roosting Bats	PRF	Suitability for Roosting Bats
T8	Semi-mature Conifer sp. (Photo 30). The trunk splits into two at a height of approximately 1m. Approximately 8m in height with a DBH 15cm.	None.	No PRF's were identified.	Negligible
T9	Semi-mature willow (Photo 31). Single trunk, approximately 15m in height with a DBH of 30cm.	None.	No PRF's were identified from ground level however the tree is of sufficient age to contain higher level PRF's.	Low
T10	Leyland Cypress (Photo 32). Single trunk, approximately 6m in height.	None.	No PRF's were identified	Negligible
DBH – Diameter at Breast Height DBH. This refers to the tree diameter measured at 4.5 feet above the ground.				

Photo 17: T1 Mature Willow

Photo 18: T1, north-facing broken branch

Photo 19: T1, west-facing broken branch

Photo 20: T1, north-facing broken branch

Photo 21: T1, two north-facing knots

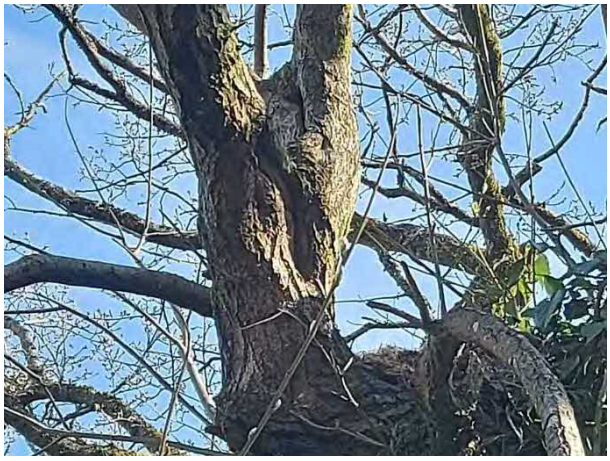

Photo 22: T1, deep west-facing crevice

Photo 23: T2 Silver birch

Photo 24: T3 Leyland cypress

Photo 25: T4 Oak

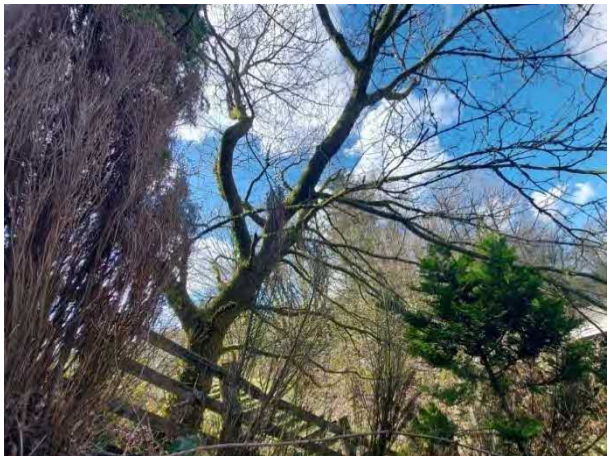

Photo 26: T4, north-facing knot-hole

Photo 27: T5 Field maple

Photo 28: T6 Field maple

Photo 29: T7 Field maple

Photo 30: T8 Conifer sp.

Photo 31: T9 Goat willow

Photo 32: T10 Leyland Cypress

Buildings and Other Structures

The stone wall on site was assessed for its suitability to support roosting bats. The wall (Photo 9) runs along the south-western boundary of the survey area and contains multiple crevices and gaps (Photo 33). There was no evidence of bats and due to the short height and exposed nature of the wall, the gaps are considered sub-optimal for roosting or hibernating bats. Overall, the wall is considered to have low bat roosting potential.

Photos of Stone Wall Crevices

Photo 33: Stone wall gap

Foraging and Commuting Habitat

The main habitats on-site including bare ground, poor semi-improved grassland and recently-felled scattered scrub are considered suboptimal for bats. However, the peripheral scattered trees and dense scrub habitat on the north-east and south-east boundaries of the survey area provide suitable foraging opportunities and contribute to linear habitat features that could be utilised by commuting bats.

Evaluation of Ecological Value of Site for Bats

Potential Tree Roosts

Trees T2, T3, T5, T8 and T10 have been assessed as having negligible potential to support roosting bats. Trees T4, T6, T7 and T9 have been assessed as having low potential, whereas, T1 has been assessed as having high potential to support roosting bats.

Potential Building Roosts

The stone wall has been assessed as having low potential to support roosting bats due to the presence of multiple cracks and crevices. However, it is not considered likely to be suitable for supporting high numbers of bats due to its low height and exposed position.

Potential Foraging and Commuting Habitat

The peripheral scattered trees on-site and the sites close proximity to the adjacent ancient semi-natural woodland to the east and un-named stream to the south form a continuous habitat corridor and connect the site to the wider landscape. Additionally, the site also lies within 1km of eight known bat roosts, including a maternity roost. However, the main works area comprises habitats suboptimal for bats due to their lack of structural or species diversity, therefore, the site is collectively considered to provide low quality foraging and commuting habitat for bats.

Further surveys to determine the value of the site for commuting and foraging bats are not considered necessary.

The site has been assessed as having low potential to support foraging and commuting bats. Consequently, bat transect/static detector surveys to determine the value of the site for commuting and foraging bats are not considered necessary.

Impact Assessment of Proposed Development on Bats

The following direct impacts to bats may occur as a result of the development:

The clearance of the dense scrub will result in approximately 50m^2 of low-quality foraging and commuting habitat being lost, resulting in a small degree of fragmentation of ecological connectivity for commuting bats. However, this impact will be limited as other linear habitat features lie beyond the small section being removed. This loss will be permanent in nature, therefore, recommendations to mitigate and compensate such impacts are presented in Section 4.

The following indirect impacts to bats may occur as a result of the development:

The stone wall is proposed for retention, however, there is a risk that the wall may be subject to accidental damage during general construction activities. As it has been assessed as having low potential to support roosting bats, protective barriers will therefore be installed prior to any site work, to ensure that no such inadvertent impacts occur (see Section 4).

All trees (T1-T10) are proposed for retention, however, there is a risk that they may be subject to root damage as a result of heavy plant movement over the root protection area, or accidental damage during general construction activities. Trees T4, T6, T7, T9 and T1 have been assessed as having low to high bat roost potential. Protective barriers will therefore be installed prior to any site work, to ensure that no such inadvertent impacts occur (see Section 4).

Due to the change of use of the site, increases in artificial lighting levels will be significant, both during the construction phase and the operational phase of the development. If this lighting envelops the adjacent woodland and trees of the site, it could adversely affect foraging and commuting bats. A sensitive lighting strategy must therefore be developed (see Section 4).

3.7.4. Dormice

Desk Study Results

BIS did not return any published records of dormice from within 1km of the site.

Field Survey Results

No signs or evidence of dormice was recorded on site. The poor semi-improved grassland and bare ground is considered to be unsuitable for dormice. However, the scattered trees on the south-western boundary and the dense scrub on the north-eastern boundary of the site provide suitable habitat to support dormice.

Together these habitats contain five food-plants known to form part of the dormice diet (oak, hawthorn, bramble, holly and ivy).

Evaluation of Ecological Value of Site for Dormice

The site has low potential to support dormice. The small areas of dense scrub and scattered trees provide opportunity for foraging and arboreal movement and are connected to the adjacent woodland to the east. However, the survey area mainly comprises poor semi-improved grassland and bare ground which is wholly unsuitable for supporting dormice and there are no records of dormice within 1km of the site.

Impact Assessment of Proposed Development on Dormice

The presence of dormice within the scrub and scattered trees cannot be ruled out completely. The scattered trees and dense scrub provide moderate-quality dormouse habitat. However, the scattered trees are proposed to be retained, the dense scrub lacks the structural diversity to provide this species with protective cover or foraging opportunities and; the anticipated zone of influence within the field at the centre of the site is considered to be wholly unsuitable for use by dormice. There is nonetheless some limited potential for direct adverse impacts to occur via the death or injury of dormice if present at the time of scrub clearance. Indirect impacts associated with noise, vibrations and artificial lighting may also occur.

Considering the lack of structural or species diversity within the scrub, the lack of published records of dormice within 1km of the site, and the fact the scattered trees are proposed for retention, no further survey is considered necessary. However, as the presence of dormice cannot be ruled out completely, precautionary measures will need to be adopted, as detailed in Section 4.

3.7.5. Great Crested Newt

Desk Study Results

BIS did not return any records of GCN from within 1km of the site. Additionally, no records of common amphibians were received from within this search radius.

There are records of other amphibians, comprising two records of common toad (*Bufo bufo*), the nearest record is of which was recorded 0.56km.

Field Survey Results

Aquatic Habitat

No ponds or other areas of standing water were recorded on site during the survey. The site, therefore, does not contain suitable habitat for supporting GCN during the aquatic stage of their lifecycle.

A review of aerial and OS mapping reveals that the only other area of standing water present within 500m of the site is the pond, located 420m to the south-east of the site. However, due to access constraints a HSI assessment was not able to be undertaken.

Terrestrial Habitats

During the terrestrial stage of their lifecycle, great crested newt can make use of a range of habitats including woodland hedgerows, scrub and rough grassland for foraging, shelter and hibernation. The terrestrial habitats within the development footprint provide a mosaic of optimal and sub-optimal habitats for newts. The understory of the scattered trees, dense scrub and multiple hibernacula on-site could be utilised for foraging and hibernating individuals. However, the bare ground and short sward of semi-improved grassland provide little physical protection for this species and are considered to be wholly unsuitable.

Evaluation of Ecological Value of Site for Great Crested Newt

One potentially suitable water body was identified within 420m of the study area (see Plan 4). The waterbody lay on private land and access had not been arranged at the point of survey. It could therefore not be inspected as part of the study. However, this water body lies on the opposite side of a minor road to the proposed development site. The road is considered likely to comprise a hard barrier to GCN migration. As a general rule, suitable habitats within 250m of a breeding pond are likely to be used most frequently by GCN (English Nature 2001). When considered in addition to the lack of published records of this species within the study area, the likelihood of GCN migrating on to the proposed development site is considered unlikely, though it cannot be ruled out completely.

Impact Assessment of Proposed Development on Great Crested Newt

The presence of GCN within the site cannot be ruled out completely. The GCN guidelines state that *'Small scale losses of terrestrial habitat, especially over 250m from the breeding pond, will probably have little effect on populations but some mitigation may be required'* (English Nature 2001). Considering that the likelihood of GCN migrating into the proposed works area is very low, no adverse impacts are anticipated. Precautionary measures are outlined in Section 4.

3.7.6. Otter

Desk Study Results

BIS returned one record of otter from within 1km of the site. The nearest record was made in 2019, approximately 0.5km away.

Field Survey Results

No evidence of otter such as spraint or holts was recorded during the survey. There are two watercourses on the northern and southern boundaries of the site. The Nant Helen lies 200m to the north and was not assessed as it is poorly connected due to the busy A4221 road and, therefore, outside of the scope of the survey. The un-named stream 20m to the south of the site is shallow without exposed tree roots and has minimal bank vegetation, therefore, did not contain suitable features for otter holts and only provides low foraging potential. Surrounding these habitats there is no suitable foraging habitat for otter. It is unlikely otter routinely use the site; however, the stream could be used for commuting individuals.

Evaluation of Ecological Value of Site for Otters

The un-named stream to the south of the site is considered to be of low value to otters due to the limited amount of water and lack of suitable features. The proposed works area mainly comprises bare ground, semi-improved grassland and recently-felled scrub which is considered unsuitable for otter sheltering or foraging. However, the denser scrub and adjacent woodland may be suitable for otters' shelter and foraging opportunities.

Impact Assessment of Proposed Development on Otter

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

A CEMP will be required prior to commencement of works, as detailed in Section 4.

3.7.7. Water Vole

Desk Study Results

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

Field Survey Results

No water voles, or signs of water vole were recorded along the banks of the stream surveyed, although a full targeted survey was not undertaken. The banks appeared to be unsuitable for this species due to the large amount of bare ground and absence of marginal grasses needed to provide food and shelter for water voles. The habitats within the anticipated works area are unsuitable for water voles, containing no suitable waterbodies or vegetative cover.

Evaluation of Ecological Value of Site for Water Voles

No records of water vole were returned by SEWBReC and the woodland and river habitats are not typical of those more closely associated with water vole.

Impact Assessment of Proposed Development on Water Voles

The likelihood of water voles being present on site is considered to be negligible and no adverse impacts are subsequently anticipated. They are therefore not mentioned further in this report.

3.7.8. White-Clawed Crayfish

Desk Study Results

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

Field Survey Results

No WCC were recorded within the stream; however, it has some features favoured by this species. It comprises submerged cobbles and overhanging banks providing refuges and spawning sites for WCC

Evaluation of Ecological Value of Site for WCC

WCC are typically found in watercourses of 0.75m to 1.25m deep, although they may occur in very shallow streams (around 5cm) and in deeper, slow-flowing rivers (up to 2.5m) (Holdich, 2003). The water course adjacent to the site is a stream running from the River Tawe with an estimated depth of approximately 5cm.

Impact Assessment of Proposed Development on WCC

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

3.7.9. Badgers

Desk Study Results

BIS returned one badger record within 1km of the site. This record was a sighting of a live individual made in 2003 approximately 0.5km to the west of the site.

Field Survey Results

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

Evaluation of Ecological Value of Site for Badgers

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

Impact Assessment of Proposed Development on Badgers

The presence of badgers foraging or commuting across the site cannot be ruled out completely. The site forms a small part of suitable habitat for badgers within the wider landscape. However, as badgers are nocturnal, it is considered unlikely that any foraging or commuting badgers will be encountered on site during works. Considered in addition to the absence of any obvious signs of badger presence and the lack of local records, the likelihood of adverse impacts to this species is low. Precautionary measures including site protocols are detailed in Section 4 below.

3.7.10. Reptiles

Desk Study Results

BIS returned no records of reptiles within 1km of the site.

Field Survey Results

A sighting of a common lizard (*Zootoca vivipara*) was recorded on site (Plan 3, TN1). 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 poor semi-improved grassland with bare ground interfaces, scattered scrub and multiple areas of hibernacula provides optimal habitat for reptiles. The dense vegetation in the north-east also provides protective cover for reptiles.

Evaluation of Ecological Value of Site for Reptiles

The site contains a mosaic of habitats and ecotones that could be utilised by a range of common reptile species with common lizard confirmed on site. The interfaces between the semi-improved grassland, bare ground and dense scrub along with the tree stumps, stone and brick hibernacula throughout the site are considered to potentially be important to reptiles. The varying sward heights within the vegetation could potentially offer refuge and basking opportunities with the scrub habitats providing foraging opportunities. The tree stumps throughout the site, collapsed brick wall and stone wall to the south-east and north-west of the site could also provide refuge and hibernation opportunities. The surrounding adjacent habitats are also well-suited to enable reptile migration onto site. However, due to a lack of records and the fact the site does not extend to feasibly support a large population of reptiles, it is considered to have moderate potential to support reptiles.

Impact Assessment of Proposed Development on Reptiles

The proposed works will result in the complete loss of potential reptile habitat. Clearance of the vegetation, tree stumps and collapsed brick wall may therefore result in the accidental killing or injury of reptiles. Recommendations for precautionary measures are outlined in Section 4.

3.7.11. Harvest Mice

Desk Study Results

BIS did not return any records of other harvest mice from within 1km of the site.

Field Survey Results and Assessment of Ecological Value of Site for Harvest Mice

No incidental sightings or field signs of harvest mice were recorded on site. The poor semi-improved grassland and scrub habitats lack the sward structure or height to be of value to harvest mice. The bare ground and scattered tree habitats are wholly unsuitable for harvest mice.

Impact Assessment of Proposed Development on Harvest Mice

The likelihood of harvest mice being present on site is considered to be negligible and no adverse impacts are subsequently anticipated. They are therefore not mentioned further in this report.

3.7.12. Other Mammals

Desk Study Results

BIS returned one record of other mammals within 1km of the site, comprising one common hedgehog (*Erinaceus europaeus*) which was recorded 0.24km to the north-west of the site in 2019.

Field Survey Results and Evaluation of Ecological Value of Site for Other Mammals

Multiple mole *(Talpa europaea*) hills were recorded on site (Photo 34) within the poor semi-improved grassland habitat. It is highly likely that a range of common mammals are present on the site including hedgehogs, shrews (*Sorex* sp.), voles (*Microtus/Myodes* sp.), mice (*Apodemus* sp.) and foxes (*Vulpes vulpes*) occurring either as resident species or whilst foraging and/or commuting. The dense scrub and scattered trees are considered to provide refugia for day-resting hedgehogs and hibernacula during the winter months.

Photo Evidence of Moles

Photo 34: Mole hills

Impact Assessment of Proposed Development on Other Mammals

The following direct impacts to other mammals may occur as a result of the development:

Death or injury during vegetation clearance; and

Small-scale and permanent habitat loss

The following indirect impacts to other mammals may occur as a result of the development:

Increases in disturbance levels.

The impact on potential mole and hedgehog habitat on site is considered to be relatively low and permanent. Mitigation measures are recommended in Section 4, namely the restoration or enhancement of hedgehog habitat and vegetation clearance methods that should be used to avoid impacts to small mammals.

3.7.13. Invertebrates

Desk Study Results

BIS returned no notable invertebrate records from within 1km of the study area.

Field Survey Results and Evaluation of Ecological Value of Site for Invertebrates

Three bumblebees were recorded on site gathering nectar within the scattered tree habitat. Due to the habitats present it is assumed the site will support an assemblage of invertebrates but these habitats are common and widespread in the surrounding landscape.

Impact Assessment of Proposed Development on Invertebrates

The scattered trees are proposed to be retained and provide foraging opportunities. The value of the semi-improved grassland and dense and scattered scrub within the site is limited due its small size and lack of botanical diversity. However, there is some potential for direct adverse impacts to occur, including the death or injury of invertebrates if present at the time of vegetation clearance. Indirect impacts associated with noise, vibrations and artificial lighting may also occur.

Considering the lack of certain foodplants for priority invertebrate species on site and the limited size of the semi-improved grassland; no further survey is considered necessary. However, due to potential for adverse impacts to occur, compensatory measures for invertebrates are detailed in Section 4.

4. Recommendations and Conclusions

The following recommendations are likely to be secured through planning conditions. They have been developed based on the development proposals available at the time of writing. It should be noted that they may be subject to change upon receipt of the final design. The implementation of these recommendations will ensure compliance with the Planning Policy Wales version 11 (Welsh Government, 2021)[19], TAN 5 *Nature Conservation and Planning* (2009), Section 6 and 7 of the Environment Wales Act, 2016, the Conservation of Habitats and Species Regulations 2017 which has been updated by the Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019 and the Powys Local Development Plan[20].

The recommendations aim to avoid or minimise adverse impacts on the environment and protected species, mitigate and compensate for losses where damage is unavoidable and promote opportunities to enhance biodiversity. There is a requirement that developments must provide net benefit for biodiversity.

4.1. Further Work

Works will not commence until the surveys below have been carried out. Results from these surveys will inform and allow for targeted recommendations for the avoidance (timing of works), future mitigation and compensation measures required as part of the development.
Works should not commence until further surveys have been carried out to assess the potential impact to reptiles on site.

4.1.1. Eradication of Japanese Knotweed

Guidance should be sought from Natural Resources Wales or a Japanese knotweed specialist regarding the control of Japanese knotweed, in order to prevent further spreading. Measures should broadly follow advice given in the Environment Agency's[21] Japanese Knotweed Code of Practise[2] (2013) which include:

- Preparing a method statement, detailing how Japanese knotweed will be managed on site;
- A specialist INNS (Invasive Non-Native Species) contractor will be commissioned to produce a method statement and management plan dealing with the on-site Japanese Knotweed;
- Appointing an ecological clerk of works responsible for the management of Japanese knotweed on the site; and
- Ensuring that site workers are made aware of what the plant looks like via a toolbox talk and of the measures required of them as detailed within the site Japanese knotweed strategy.

The Japanese knotweed on site will need to be dealt with in an appropriate manner either by herbicide treatment or removal of the knotweed and soil from the site in a "dig and dump" method where the soil is

[19] 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.
[20] https://en.powys.gov.uk/article/4898/Adopted-LDP-2018

[21] English guidance is used because no equivalent Welsh guidance has been produced by Natural Resources Wales.

then taken to an appropriate landfill site, or an appropriate method. See Appendix 7 for further details on Japanese Knotweed management options. An invasive species specialist should be employed to oversee management of Japanese Knotweed on the site.

4.1.2. CEMP

Due to the sensitivity of the stream, a Construction Environmental Management Plan (CEMP), will be produced prior to commencement of the proposed development works. Pollution prevention measures required are detailed within Section 4.3.1 but these will be built and expanded upon within the CEMP.

4.2. Precautionary Measures

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

4.2.1. Pollution Prevention Measures

Appropriate pollution control measures, both during construction and post construction, will be employed to protect the water quality of the un-named stream 20m to the south of the site. Surface water/pollutant run-off into any watercourse will be avoided during site preparation and construction practices. It is advisable that this is detailed within a Construction and Environmental Management Plan[22] (CEMP), conditioned as part of the planning consent.

The measures to be implemented are partly outlined in the Environment Agencies guidance document 'Working at construction and demolition sites: PPG6 Pollution Prevention Guidelines[23] and 'Guidance for Pollution Prevention Works and maintenance in or near water: GPP 5'. These include the following measures:

Works Compounds

Works compounds will not be sited immediately adjacent to the stream.

Spill Response

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

Silt/Run-off Prevention

Many construction processes produce silty water: movement and maintenance of plant and vehicles on site, rainwater run-off from exposed ground, trenches or foundations, wheel and boot wash facilities etc.

[22] The CEMP should consider the list of issues and activities listed within BS 42020:2013, Clause 10.
[23] Available online at http://bit.ly/1K1l17H. Note these guidelines were withdrawn on the 14th December 2015 but are still considered relevant.

The following measures could, if required, be implemented on site to prevent the creation of silty water and silt run-off into the stream:

Plan ahead for intense and prolonged wet weather;

Minimise the amount of time stripped ground and soil stockpiles are exposed;

Only remove vegetation from the area that needs to be exposed in the near future;

Seed or cover stockpiles;

Use geotextile silt fencing along the banks of the watercourse, to reduce the movement of silt. This should be installed before soil stripping has begun and vehicles start tracking over the site;

Run-off could, if required, be collected in a sump or collected in lagoons. This will allow suspended solids to settle before disposal;

The installation of an impermeable cut-off ditch between the site and the watercourse as well as anywhere else needed on site to prevent any run-off water entering the watercourse. The cut-off ditch will lead to a sump with settled solids removed regularly and water recycled and reused where possible. Any excess water will be discharged to foul sewer with prior permission from your local sewerage provider, or tankered off site for authorised disposal; and

Plant, wheel and boot washing.

4.2.2. Vegetation Clearance for Birds and Reptiles

Current proposals suggest that the areas of dense scrub are intended to be cleared during works. Clearance of this scrub and any other clearance to the trees or woodland on site should be undertaken from September to February, outside the bird breeding season (March to August inclusive). Alternatively, any works undertaken from March to August will be subject to a check for nesting birds by a suitably qualified ecologist immediately prior to the works. If any active nests are found these will be protected, along with an appropriate buffer zone of approximately 10m, until the nesting is complete, and the young have fledged.

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

4.2.3. Retention and Protection of Trees TN01 – TN10 and Stone Wall

Trees TN01 – TN10 and the stone wall to the southwest of the site are to be retained as part of the works. They will be protected by protective fencing during the site clearance and construction phases (see Appendix 6). This construction exclusion zone will protect the root protection area (RPA), and ensure that the wall, retained trees and their root protection areas are not damaged during the works.

4.2.4. Species Deterrence Measures for Dormice

Natural England Standing Advice[24]/[25] (last updated 29th July 2015) states that dormouse surveys can be limited to visual searches for nests and opened nuts if the work only involves losing a small amount of habitat, such as the small section of scrub on the northern boundary of the site. As the proposed development is likely to involve such works, it is recommended that a visual search of this type is undertaken by a licensed ecologist before any scrub or bramble beds are cleared. In the unlikely event that dormice are found during the proposed works, all works will stop immediately, and advice sought from NRW and/or a licenced ecological consultant. If the development cannot be amended, a European Protected Species Mitigation Licence from NRW may be required.

As an extra precautionary measure, any sections of scrub or bramble beds to be cleared will first be coppiced or cut back during the winter months (November – March inclusive). Hand tools will be used to minimise ground disturbance. The subsequent removal of the remaining vegetation and stumps (if required) will not be undertaken until late April/early May, so that any dormice present will have emerged from hibernation and will be able to disperse into neighbouring areas of woodland and scrub. This phased approach is timed to avoid disruptive works when these animals are hibernating at ground level and are less unable to escape the area of works. Works will begin on the westernmost point and progress in a linear fashion eastward so that any animals present can move to safer areas.

4.2.5. Method Statement for Reptiles (Conditioned as Part of the Planning Consent)

Prior to works commencing on site a precautionary method statement (prepared separately) with regards to reptiles will be submitted and agreed with the Local Planning Authority (Powys County Council). The method statement will outline how the development will avoid, mitigate, and compensate for any potential impacts on reptiles. The reptile mitigation strategy will be sufficiently robust to give confidence that the scenario in which a high population of reptiles is present, including multiple species can be successfully accommodated. The development will be undertaken in adherence to the agreed method statement.

The method statement is likely to involve an initial reptile survey of site (7 repeat surveys involve direct searching and surveys of Artificial Cover Objects (ACOs)). If a negative result is obtained (i.e likely absence of reptiles on site) only precautionary measures will be required. If reptiles are present on-site mitigation will be proportionate depending upon the size of the reptile population on site, and mitigation will commence immediately after the first individual has been found.

4.2.6. Good Construction Practices for Mammals

[24] https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects
[25] Natural England guidance is referenced as no equivalent guidance is available from NRW.

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

4.2.7. GCN

Mitigation for great crested newt should concentrate primarily on minimising the potential for causing the death and injury of individuals during site clearance and building operations.

Contractors should check beneath potential refugia, such as large stones, logs and metal sheets etc, for great crested newts (and other fauna) as these are lifted. Any faunal species which are present should be allowed to vacate the works area unaffected, or should be carefully assisted in doing so.

In the event of great crested newt being encountered during any of the activities on site, then all works should stop immediately and the advice of an appropriately-qualified ecologist sought.

4.3. Mitigation Measures

4.3.1. Sensitive Lighting Strategy

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

The lighting will follow a 'bat friendly' specification:

External lighting will be minimised and installed at low-level only (i.e. no higher than eaves level and lower than 2.4m) and directed downward (i.e. below the horizontal plane with no upward tilt). Fully shielded lights with front and side hoods/shields or cowls will be installed to prevent upwards and horizontal light spill. The lighting source will not be visible. See Appendix 7 for examples.

Any security lights used will operate off a passive infrared (PIR) motion sensor sensitive to large objects only, to avoid constant triggers by bat passes and with timers set on a short duration (i.e. a maximum 'on' time of one minute) to reduce the amount of 'lit time'. The lights will either have an integrated LED light source or use LED bulbs. They will be low intensity (i.e. circa 11 watts) and have a warm white colour temperature of 3000K or less (ideally 2700K if commercially available). White, blue and green lighting sources, including mercury or metal halide, CPO and CDO (ceramic discharge metal-halide) bulbs, will be avoided as these have effects on bats.

If bollard-style lighting will be used this will similarly be downward facing. See Appendix 8 for examples.

4.4. Compensation and Enhancement Measures

Full details of compensation and enhancement measures will be devised after completion of the further surveys detailed above and the finalisation of development proposals.

4.4.1. Enhancement Measures for Bats

To enhance the site for bats, roosting opportunities will be provided on the site through the provision of artificial bat roosts. A variety of durable, woodcrete bat boxes, including maintenance free boxes suitable for trees are available from Vivara Pro. A bat box will be installed on T1 towards east of the site. It will face a westerly through south easterly aspect and be placed in a position which is not overly-exposed. Boxes will be located at least 3.5m (preferably 5m) above ground level, with bat boxes in positions where the entrance is not artificially illuminated at night.

Further, consideration will be given into installing bat features into the new building design such as inconspicuous bat bricks/tubes.

See Appendix 9 for further details.

4.4.2. Enhancement Measures for Birds

To enhance the site for nesting birds, two bird boxes will be fitted to trees within the scattered tree habitat, with entrance holes facing to the north or east. They will be located in secluded positions, ideally within dense cover and at a minimum height of 3 metres from ground level.

A variety of durable, woodcrete bird boxes, including maintenance free boxes suitable for trees, are available from Vivara Pro.

Open fronted – Open fronted nest boxes cater for a range of bird species, including robin, dunnock (*Prunella modularis*) and wren. Due to the more exposed nature of these nest boxes, it is especially important to ensure that they are located in dense cover in order to avoid the attention of potential predators; and

Standard nest boxes – An entrance hole of 32mm will attract species such as great, blue, blackbirds and sparrows.

See Appendix 10 for further details.

4.4.3. Compensatory Planting and Use of Landscaping Scheme

Any landscaping in the gardens surrounding the new properties will use native shrubs and trees which are of UK provenance. Berry and nut producing species should also be used which will increase foraging opportunities for numerous animal species. Shrub species recommended include: common hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), hazel, guelder rose (*Viburnum opulus*), rowan (*Sorbus aucuparia*), bird cherry (*Prunus padus*) and holly.

Plant species that provide a rich source of nectar could be used. Suitable species include flowering shrubs such as privet (*Ligustrum vulgare*) and dogwood (*Cornus sanguinea*).

These will provide compensatory nesting and foraging habitat for invertebrates and birds.

4.4.4. Hedgehogs Habitat Management

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

"Wild corners"- patches of long, natural vegetation could be left;

Log piles to provide a secure site for use by breeding and hibernating hedgehogs. This should be sited in longer vegetation;

The use of hedgerows instead of fences;

The avoidance of pesticides including slug pellets, herbicides and insecticides during landscaping of the site; and

Dedicated hedgehog nesting/hibernation shelters could be placed in suitable well-vegetated areas of the site.

4.4.5. Sustainable Urban Drainage Systems (SuDs)

As of 7th January 2019, all new developments of more than one dwelling house or where the construction area is 100m² or more are required to have SuDS to manage on-site surface water (whether they require planning permission or not). These SuDS must be designed and constructed in accordance with the Welsh Government Standards for Sustainable Drainage[26].

There is scope to incorporate ecological enhancement measures into the design of the SuDs features, without compromising its core function.

4.5. 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 NRW[27], (CIEEM, 2019) and BS 42020:2013[28], to determine if conditions have changed since those described in this report.

4.6. Conclusions

The full extent of ecological impacts and potential constraints of the proposed development cannot be fully determined, in the absence of finalised architectural plans and based on the results of the preliminary ecological appraisal survey alone. Further survey work will be required before such assessments can be comprehensively made, as detailed in Section 4.2.

[26] https://gov.wales/sites/default/files/publications/2019-06/statutory-guidance.pdf
[27] 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.
[28] 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).

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

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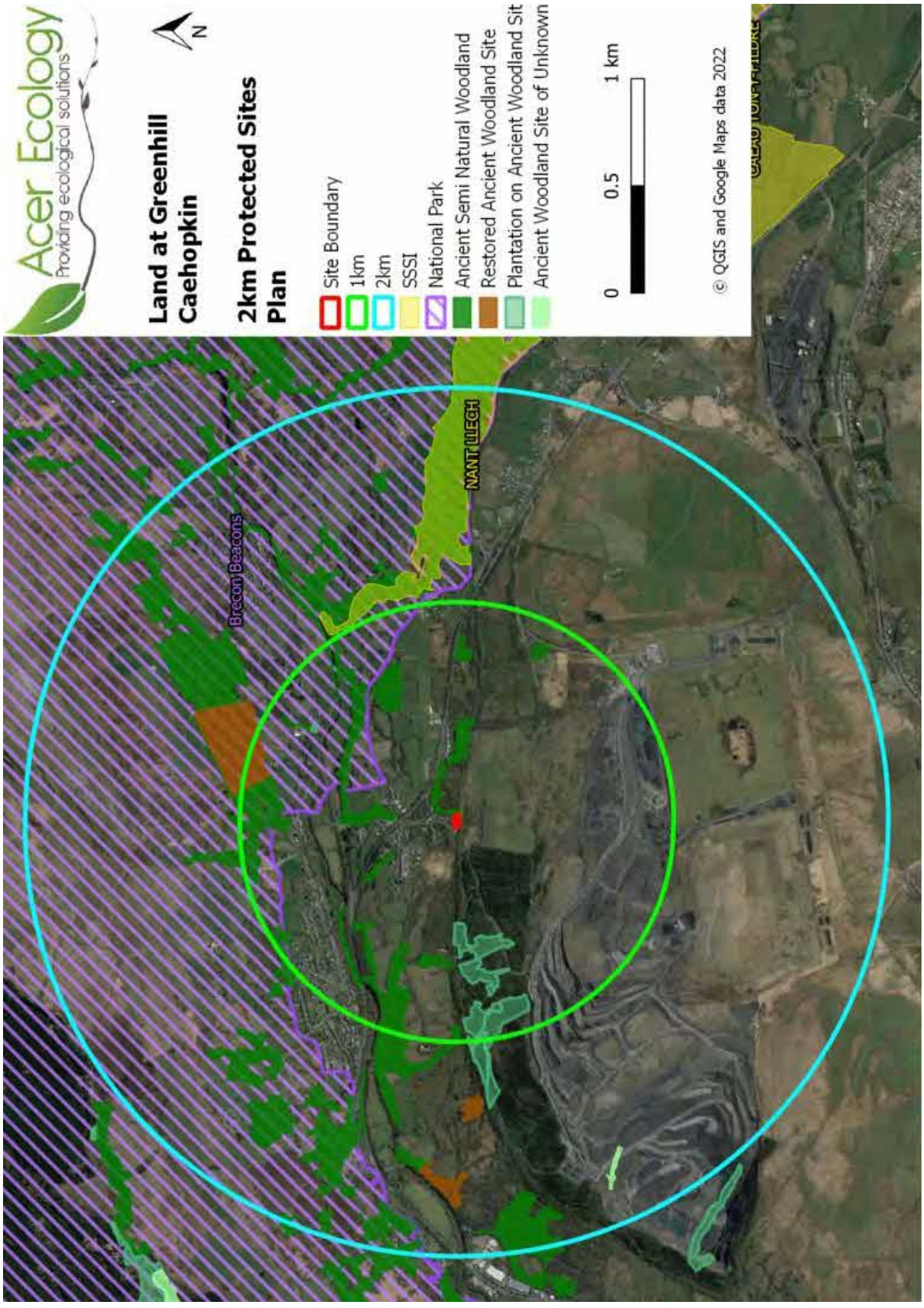
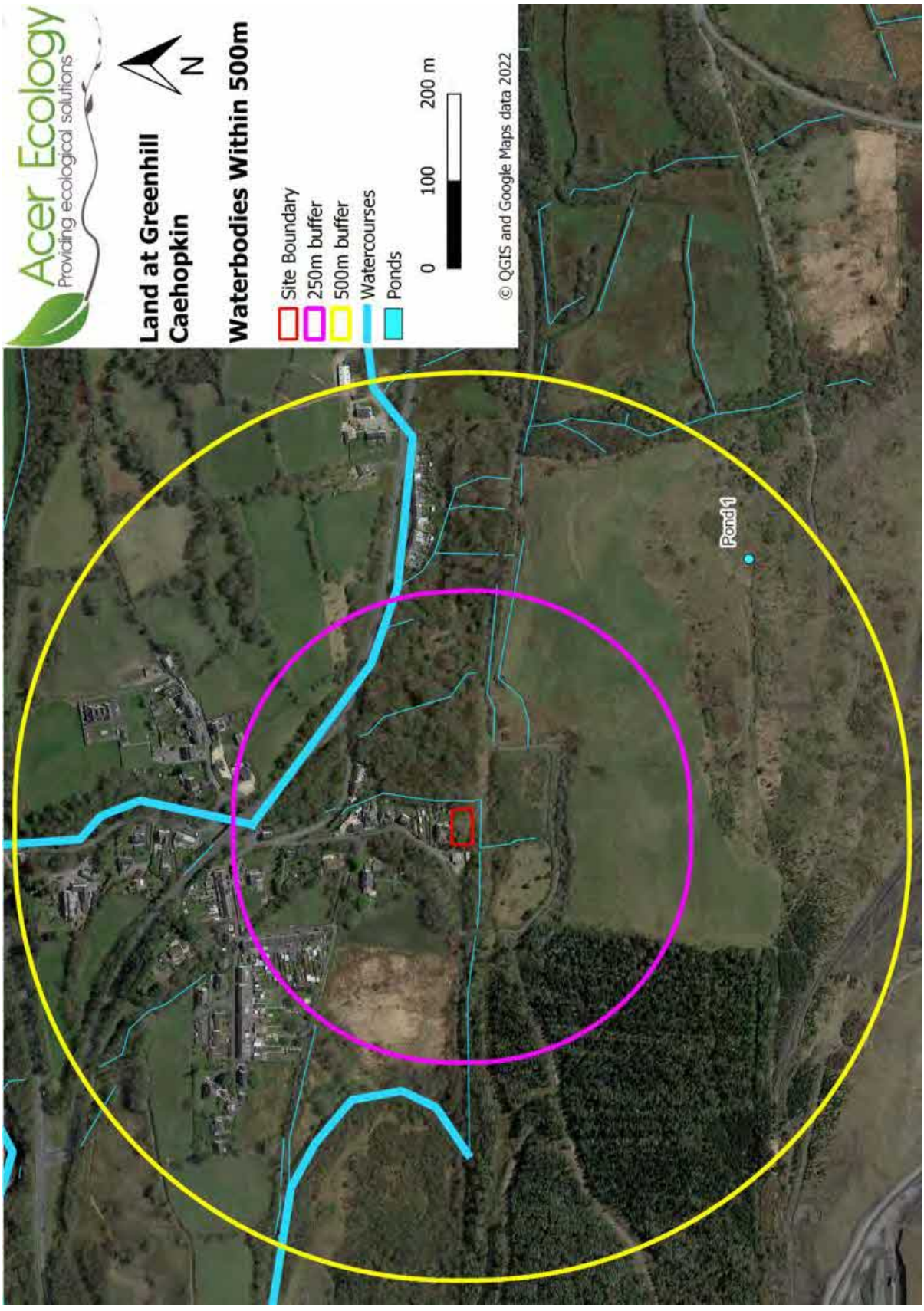
Plan 1: Site Location

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



Plan 3: Habitats and Vegetation

Plan 4: Location of Water Bodies within 0.5km of Site



Appendix 1: Legislation and Policy Relating to Statutory and Non-Statutory Designated Sites and Planning Policy Relevant to Site

SSSIs

SSSIs are important as they support support habitats and/or species of national importance. 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.

National Parks

National Parks are designated for their aesthetic and recreational value as opposed to wildlife value, however, they often contain habitats of high ecological value also.

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 (2021).

Planning Policy Wales 11 states: "Ancient woodland and semi-natural woodlands ... are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees and woodlands should be afforded protection from development which would result in their loss or deterioration unless there are significant and clearly defined public benefits".

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."

Environment (Wales) Act 2016

The Environment (Wales) Act Section 6 duty, or the Biodiversity Duty, requires public authorities to seek to maintain and enhance biodiversity 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.

Future Wales - the National Plan 2040

Future Wales is the national development framework, setting the direction for development in Wales to 2040. It is a development plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of our communities. Future Wales - the national plan 2040 is the national development framework and it is the highest tier plan, setting the direction for development in Wales to 2040. It is a framework which will be built on by Strategic Development Plans at a regional level and Local Development Plans. Planning decisions at every level of the planning system in Wales must be taken in accordance with the development plan as a whole.

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 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.

Powys County Council Local Development Plan

Policy DM2 states that '*development proposals shall demonstrate how they protect, positively manage and enhance biodiversity interests including improving the resilience of biodiversity through the enhanced connectivity of habitats within and beyond the site'* (pg.49). Any development on environmentally protected land must prove that will not '*adversely affect the integrity of the site'* and where this is not the case *'appropriate compensatory measures must be secured'* (pg.49).

Biodiversity Net Gain

Net benefit for biodiversity Planning Policy Wales (PPW) 11 sets out that "*planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means that development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity*" (para 6.4.5 refers). This policy and subsequent policies in Chapter 6 of PPW 11 respond to the Section 6 Duty of the Environment (Wales) Act 2016.

Appendix 2: Protected and Invasive Species Legislation Relevant to Site

Birds

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

Section 10.8 of the Conservation of Habitats and Species Regulations 2017 state that Local authorities must use all reasonable endeavours to avoid any deterioration of habitats of wild birds.

Bats

All species of bats and their roosting sites are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 which continues to apply in UK law through the Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019.

All species of UK bats are designated as 'European protected species'. Seven species of bat (soprano pipistrelle (*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.

Great Crested Newt

GCN is a 'European protected species' afforded full protection under UK legislation. This protection extends to the habitats which support GCN and it is generally assumed that the species might be present in terrestrial habitats up to 0.5km[29] of a breeding pond, depending on habitat quality, connectivity and population size. The GCN newt is a priority species in Wales under Section 7 of the Environment (Wales) Act 2016.

It is also included in the Powys County Council Local Biodiversity Action Plan.

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

Regulation 55(2) of the Conservation of Habitats and Species Regulations 2017 defines the circumstances where derogation is allowed for an affected EPS and a licence could be issued by Natural England. All three test are to be met by the proposals prior to planning permission being allowed which include:

1. The first test set out in Regulation 55(2)(e) deems that the need for the development should be in the interests of public health, public safety and an imperative reason of overriding public interest, which includes beneficial consequences of primary importance for the environment;
2. The second test set out in Regulation 55(9)(a) deems that there should be and 'no satisfactory alternative';
3. The third test set out in Regulation 55(9)(b) deems that the development should have no detrimental effect on the favourable conservation status of an EPS.

The GCN district licensing scheme can be used instead of making a GCN licence development application to Natural England.

Dormice

Dormice are a 'European protected species' and afforded full protection under UK 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% per year (PTES, 2019). It is included in the Powys County Council Local Biodiversity Action Plan.

Otters

Otters are a 'European Protected Species'. Their breeding sites or resting places[30] are fully protected under UK legislation. Otter is a priority species in Wales Under Section 7 of the Environment (Wales) Act 2016.

Works affecting otter are subject to licensing procedures by NRW.

Water Voles

Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) which prohibits the deliberate killing or injury of individuals, damaging, destroying or blocking access to their places of protection (either intentionally or through ignorance), disturbing them in a place of shelter, or possessing them. The habitats of common water voles are not specifically protected. Water voles are listed as a priority species in Wales under Section 7 of the Environment (Wales) Act 2016.

White-clawed Crayfish

[30] Resting places are defined as 'areas that are essential to sustain an animal or group of animals when they are not active' (Anon 2007).

White-clawed crayfish are listed in the Habitat's and Species Directive (Annex 2 non-priority species) and are listed in Wales under Schedule 5 of the Wildlife and Countryside Act (1981). They are also listed as priority species in Wales under Section 7 of the Environment (Wales) Act 2016.

Badgers

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

Reptiles

With the exception of smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) (which are afforded greater protection), common reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are given so-called 'partial protection', which prohibits the deliberate killing or injury of individuals. The habitats of common reptiles are not specifically protected. These species are listed as priority species in Wales under Section 7 of the Environment (Wales) Act 2016.

Hedgehogs

Hedgehogs are listed as a Red List mammal species in Britain and are afforded partial protection under the Wildlife and Countryside Act (1981) and are listed as priority species under 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 Section 7 of the Environment (Wales) Act 2016) means that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity[31]. In effect, 'conserving biodiversity' includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

They are also listed in the Powys County Council LBAP in light of dramatic population declines.

Japanese Knotweed

Japanese knotweed is listed under Schedule 9[32] of the Wildlife and Countryside Act (1981), as amended. This act specifically prohibits the reckless or deliberate spreading of this species. Japanese knotweed will require eradication from the site.

[31] Biodiversity conservation in respect to hedgehogs is interpreted as a commitment to restoring or enhancing their population.
[32] https://www.legislation.gov.uk/ukpga/1981/69/schedule/9/part/II

Appendix 3: Species Recorded

All species recorded by Acer Ecology, 2022

Taxonomic Name	Common Name	W	LM	CG	LDA	PMG	PIL	TF	Status
Trees and Shrubs									
Acer campestre	Field maple	W							
Alnus glutinosa	Common alder								
Betula pendula	Silver birch								
Betula sp	Birch								
Cornus sanguinea	Dogwood								
Crataegus monogyna	Common hawthorn								
Ilex aquifolium	Holly								
Prunus laurocerasus	Cherry laurel								Alien
Prunus sp	Cherry								
Quercus sp	Oak								
Rubus fruticosus agg.	Bramble								
Salix spp.	Willow								
x Cuppressocyparis leylandii	Leyland cypress								Alien
Herbaceous									
Asplenium trichomanes	Maidenhair spleenwort								
Cardamine hirsuta	Hairy bitter-cress								
Chrysosplenium oppositifolium	Opposite leaved golden saxifrage	W							
Cirsium vulgare	Spear thistle								
Dactylis glomerata	Cock's-foot								
Epilobium tetragonum	Square-stalked willowherb								
Fallopia japonica	Japanese knotweed								WCA 9
Galium aparine	Cleavers								
Holcus lanatus	Yorkshire fog								
Hyacinthoides non-scripta	Bluebell	W							
Juncus effusus	Soft rush								
Lathyrus pratensis	Meadow vetchling		LM						
Ligustrum sp	Privet								
Lonicera nitida	Wilson's honeysuckle								
Lotus corniculatus	Common bird's-foot-trefoil		LM	CG			PIL		
Asplenium scolopendrium	Hart's-tongue fern								
Plantago lanceolata	Ribwort plantain								
Polypodium sp	Polypody								
Primula vulgaris	Primrose	W							
Ranunculus bulbosus	Bulbous buttercup		LM	CG					
Ranunculus repens	Creeping buttercup								
Rumex acetosa	Common sorrel						PIL		

Rumex crispus	Curled dock								
Senecio jacobaea	Common ragwort								
Teucrium scorodonia	Wood sage						PIL		
Urtica dioica	Common nettle								

'Habitat Indicator Species' Totals (Wales Biodiversity Partnership 2008[33])		4	3	2			4		
		W	LM	CG	LDA	PMR	PIL	TF	

'Primary' and 'Contributory' Totals (Wales Biodiversity Partnership 2008)		0	0
		Primary Species	Contributory Species

Key to Indicator Species (Wales Biodiversity Partnership 2008[34])

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.

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

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

[33] Wales Biodiversity Partnership (2008) Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales. Wales Biodiversity Partnership/Welsh Assembly Government.

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.

Appendix 5: Guidelines for Assessing Potential Suitability of Proposed Development Site for Bats [35]

Suitability	Description of Roosting Habitat	Commuting and Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats. Trees T2, T3, T5, T8 and T10	Negligible habitat features on site likely to be used by commuting and foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection appropriate conditions[36] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity) or hibernation[37]. A tree of sufficient size and age to contain PRFs but with none seen from the ground[38]. Trees T4, T6, T7 and T9 and Stone wall	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions 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.	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. Tree T1	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

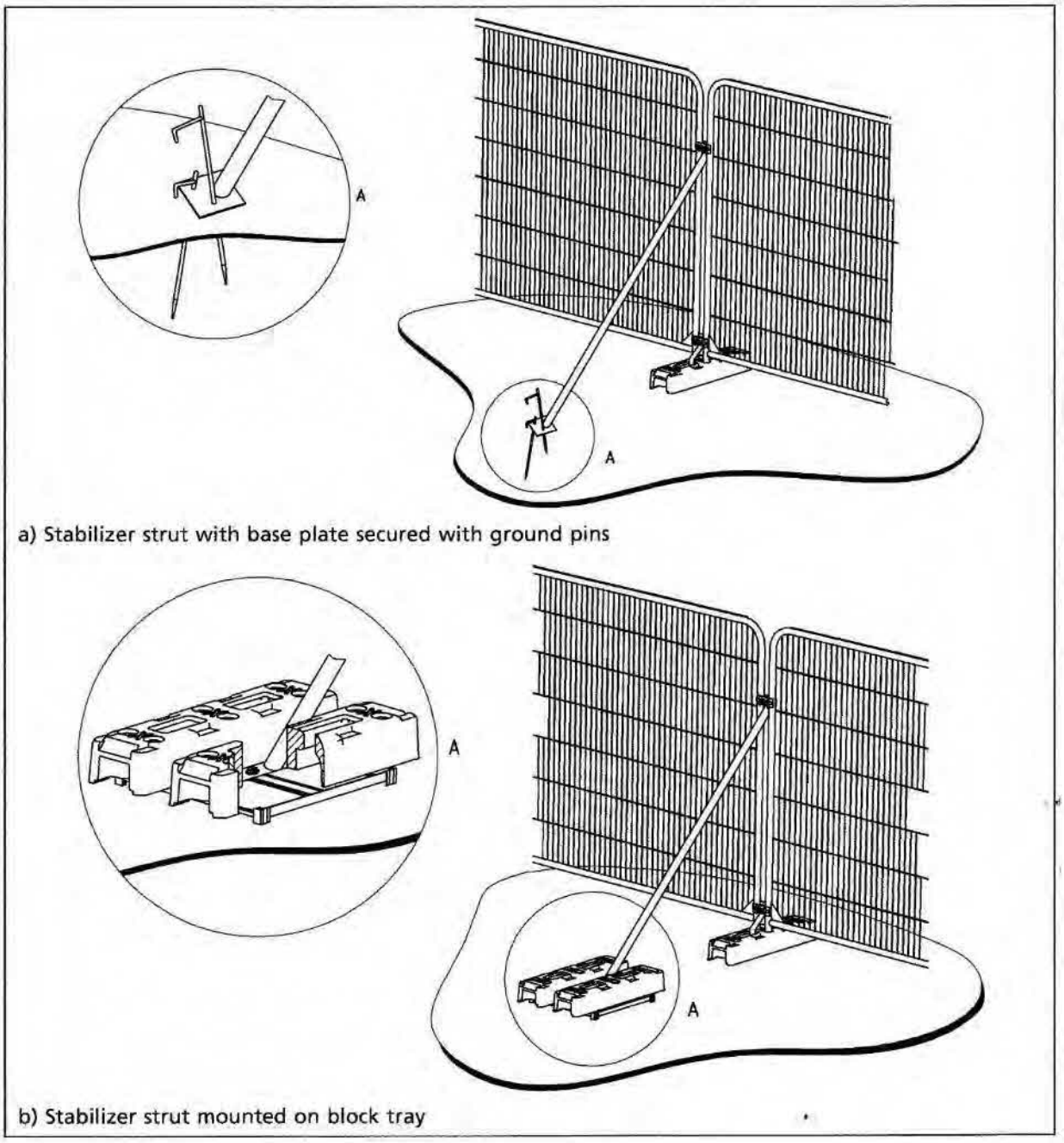
[35] Table 4.1 in Collins (2016)

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

[37] 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.

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

Appendix 6: Protective Fencing



Appendix 7: General Management Options for Japanese Knotweed

General Japanese knotweed Control & Treatment Methods

Due to variations in soil type, topography, adjacent sensitivities, degree of Japanese knotweed infestation, and time and money available different control methods and combinations of various methods can be used.

Each method has advantages and disadvantages, but all controls require time and care and even after apparent control and there must be vigilant monitoring of the site for a period of time and care taken to not reinfect the site from other sources.

Currently there are four many by which Japanese knotweed can be controlled. These are:

Chemical/ herbicide; long-term treatment with herbicides.

Physical; excavation and disposal at a licensed landfill site or

Combined: Excavation, deep burial and/or bunding on site prior to treatment with herbicide.

Biological controls – in the research phase for suitable and safe for release in the UK by the Centre for Agriculture and Biosciences International (CABI[3]),

Chemical/Herbicide Control

The herbicide method used by Knotweed Control generally takes 3 years but this can vary due to many factors which are outlined in the introductory letter send on first contact with Knotweed Control.

Knotweed Control uses in situ herbicide treatment of Japanese knotweed using a professional, aquatic approved glyphosate-based herbicide applied via stem injection or foliar spray

Glyphosate is a systemic herbicide which is translocated into the rhizomes using the plants' own vascular system where it inhibits enzyme production weakening and over time kills the plant.

Treatment can take place once the knotweed is large enough, green and actively growing, before the knotweed dies back in the autumn or is damaged by early frosts.

Optimum treatment time for stem injection and foliar spray is late summer/ autumn avoiding flowering to protect pollinators.

The herbicide will be fully active in about 7 days and continue to work for approximately up to 14 days therefore should be left undisturbed for this period

There are many dormant nodes (growing points) on the rhizome which under suitable conditions can be activated. These nodes as well as deep, woody rhizomes can make knotweed treatment lengthy and unpredictable and whose dormancy can be broken by disturbance.

If done incorrectly there is some evidence that shows herbicide treatment can deform subsequent years' growth, making future treatment harder, force knotweed rhizomes into dormancy for up to 20 years, or even make it can grow and spread more rapidly than if left undisturbed, all natural responses to the knotweed being "attacked".

Stem Injection Application

Knotweed Control's preferred method is stem injection as it is very effective, highly targeted

Stems need to be at least 8mm to stem inject therefore can only be used on larger plants.

Injection can take place in a wide range of weather conditions but not when it is too wet or in slippery conditions underfoot.

Foliar Spray Application

Foliar spray of herbicide is a good alternative where plants are small. It should take place in low wind conditions to reduce drift onto other plants and when there is no rain for 6 hours to make sure it is rainfast.

People, pets and wildlife don't need be excluded from treated areas once the herbicide is dry but it is best keep out not to spread herbicide onto non target plants.

Factors Affecting the Success of Treatment

Treatment can only commence when:

Japanese knotweed growing healthy, plants reach optimum size and weather conditions are suitable;

Plants must be at least 1-1.5m height for foliar spray with full leaf cover and can only take place in dry calm conditions when there is no rain forecast for 6 hours to ensure absorption by the plant;

Treatment must not take place when there is any frosts, drought conditions and before the plants die back in the autumn; and

Stems need to be about 8mm for stem injection treatment and although less weather dependant, conditions must be safe for the operator.

The success of treatment is determined by a number of factors some of which are not always easy to predict or evident at the time of the survey. Variable factors include:

The density, size of infestation and length of time site the is infected - established large plants can have large woody rhizomes which can extend horizontally 7m and vertically 3m. The larger the rhizome the longer the treatment required.

The health of the plants - actively growing plants are more susceptible to the treatment. Stressed plants whether due to drought, poor soil or deep shade don't respond as well.

The time of year - autumn is optimum treatment period when the plant growth is at its maximum growth

Japanese knotweed has many dormant nodes (growing points) on the rhizome and if they are disturbed can be reactivated. These nodes make knotweed treatment lengthy and unpredictable.

Longer term success of Japanese knotweed control is also dependant on other factors:

There is a high risk of re-infection if the original source of knotweed is left untreated e.g. on adjoining land. It is therefore highly recommended that clients consider liaising with adjacent landowners to ensure the whole area is brought under management.

Fragments of rhizome as small as 0.7gram (pea sized) can grow into new plants so it must be ensured other site users follow a strict code of site hygiene with material, equipment and even footwear when moving around and on/ off site.

Explanation of the 7m Fencing and Herbicide Buffer Zone

7m is the average distance growth rhizomes underground from each plant therefore the standard distance used by both the Royal Institution of Chartered Surveyors (RICS) information paper on Japanese knotweed and in the Environment Agency's Managing Japanese knotweed on Development Sites: Code of Practice) and is used as an acceptable distance from which to not warrant risk.

However, rhizomes generally extend less than 7m, but can also extend further depending on many factors including growing conditions, substrate, length on site on site etc.

Vigilance and care is required when digging or disturbing during any ground works so not to spread any knotweed material therefore Knotweed Control suggests there should be no disturbance of the land within this buffer zone which could cause spread of the rhizome

Where possible fencing should be erected with signage before any construction begins and throughout the treatment programme, and a herbicide treatment buffer zone can reduce the likelihood of spread.

Appendix 8: Examples of Suitable Wall Light Fittings

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

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

Appendix 9: Bat Boxes

Vivara Pro Woodstone Bat Box

The Vivara Pro WoodStone Bat Box is a hard waring bat box. It is made from WoodStone, a mixture of wood fibers from fully certified FSC wood sources and concrete, and it is designed to last for years.

It is breathable so there will be no problems with condensation and WoodStone maintains a consistent temperature inside, providing excellent insulation for roosting bats. WoodStone also provides a rough surface which the bats can easily cling to and move around the box. The Vivara Pro WoodStone Bat Box is black with a grey front panel.

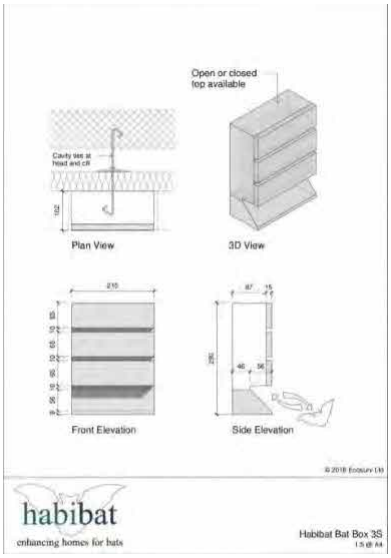
Siting - The box can be attached to either a wall or a tree and should be sited at a height of at least 3 m from the ground. Bats prefer to change roosts to benefit from varying ambient temperatures, so bat boxes should ideally be clustered in small groups.

Dimensions - (H) 250 x (W) 190 x (D) 165 mm, weight: 4.5 kg.

Bat Box Availability

The bat box is available from NHBS (www.nhbs.com) where it retails at approximately £20.99 including VAT.

Habibat In-Wall Bat Box



The Habibat Bat Box is a large, solid box made of insulating concrete with an internal roost space, which can be incorporated into the fabric of a building as it is built or renovated. This box is made to order and faced in brick to match your building. If you do not know your brick code you can send 6 of your own bricks to be used on the face of the box. It is supplied un-pointed so it can be matched as closely as possible to the building.

The Habibat box is suitable for species which are most commonly found roosting in buildings in the UK, such as Pipistrelle, Natterer's, Whiskered, and Brandt's bats.

The bat box should be located where it will receive the maximum amount of sunlight i.e be the southerly aspects/orientation (south, southwest and southeast).

Dimensions - (H) 300 x (W) 215 x (D) 102 mm, weight: 6kg.

Bat Box Availability

The bat box is available from Wildcare (Habibat 3S Built-in Bat Box (wildcare.co.uk)) where it retails at approximately £86.26 including VAT.

Appendix 10: Bird Boxes

Vivara Pro Barcelona WoodStone Open Nest 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.

Dimensions - (H) 240 x (W) 190 x (D) 175 mm.

Bird Box Availability

The bird box is available from NHBS (www.nhbs.com) where it retails at approximately £22.99 including VAT.

NHBS Traditional Wooden Nest Box

The wooden bird nest boxes have been custom designed and manufactured from substantial 2cm thick FSC-certified European Redwood. These simple, breathable wooden bird boxes have a sloping roof and four drainage holes and are ideal for providing crucial nesting spaces for the smaller garden birds.

Nest boxes also provide vital roosting spaces for birds during the cold winter months and the thick walls of these nest boxes will ensure that roosting birds stay warm.

The boxes can be expected to last 5-10 years and are constructed using stainless steel staples which will not rust.

These boxes can be installed on a tree or wall and should be placed two to four metres above ground. There should be a clear flight path to the entrance hole and the boxes should be placed so that the entrance is not exposed to strong sunlight or winds.

Dimensions - (H) 245 x (W) 135 x (D) 185 mm

Bird Box Availability

The bat box is available from NHBS (www.nhbs.com) where it retails at approximately £14.95 including VAT.