PERSIMMON HOMES EAST WALES

LAND AT WEYCOCK CROSS, BARRY, VALE OF GLAMORGAN

PRELIMINARY ECOLOGICAL APPRAISAL

MAY 2025

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CONTENTS

SUMMARY

Soltys Brewster Ecology were instructed by Asbri Planning (on behalf of Persimmon Homes East Wales) to undertake a preliminary ecological appraisal of a parcel of land found near Weycock Cross in Barry. The site has been proposed as a candidate site for residential development as part of Vale of Glamorgan's Replacement Local Development Plan (RLDP) review process. A survey to establish the baseline ecological conditions and identify any ecological constraints or opportunities at the site is therefore required to inform the current promotion.

Desk based consultation confirmed the site holds no statutory designations for nature conservation, although 6no. SSSIs can be found within a 5km search radius – none of which would be affected by the proposed development. Ten non-statutory designations also lie within a 1km radius of the candidate site, of which only North East of Knock Man Down Wood SINC was considered of ecological relevance, with this site lying directly adjacent to the candidate site's eastern/southeastern boundary. The desk study also returned records for protected fauna and flora within 1km of the site, including records for foraging/commuting bats, Badger, Otter, Hazel Dormice and common herpetofauna (reptiles and amphibians) – a single dormouse record is associated with the site itself. The desk study also returned a short list of protected, and priority listed bird and invertebrate species.

An Extended Phase 1 Habitat survey undertaken in April 2025 revealed a limited number of habitats present at the site, consistent with what was recorded/mapped in 2022 as part of the promotion of the northeastern part of the current Candidate site. The site comprises of six agricultural field parcels containing arable crops and improved grassland – the fields hold little to no ecological value and represent the most suited areas for any future development. A series of hedgerows, ditches, dense scrub and woodland border the fields, and these represent more valuable habitats, with native hedgerows and lowland deciduous woodland both listed as Priority Habitats under Section 7 of the Environment Act (Wales) 2016. There are no habitats at the site that would qualify as a SINC (other than the boundary woodland which has already been designated). The habitats found at the site were considered capable of supporting foraging/commuting/roosting bats, both tree/shrub and ground nesting bird species, small numbers of common herpetofauna (reptiles and amphibians), Hazel Dormouse, Otter (on an irregular basis) and other small mammals. Evidence of Badger activity was also found at the site.

Dependent on any future layout plans, further survey work is likely to be required for bats and Hazel Dormice, with some form of mitigation also likely required for any loss of ground nesting bird habitat. Appropriate controls should also be implemented across the site to safeguard Otter, Badgers, herpetofauna etc. The scheme should also provide enhancements for biodiversity, which could include the provision of bat/bird boxes and hibernacula; the creation (or retention) of an 'ecology mitigation zone'; native tree/shrub planting; and the positive management of retained/newly created habitats in order to encourage botanical diversity.

1.0 INTRODUCTION

1.1 Soltys Brester Ecology (SBE) were commissioned by Asbri Planning (on behalf of Persimmon Homes East Wales) to undertake a Preliminary Ecological Appraisal (PEA) of an area of land found near Weycock Cross in Barry. The area has been proposed as a candidate site for residential development as part of Vale of Glamorgan's Replacement Local Development Plan (RLDP) review process. A section of the candidate site (northeastern fields) was previously surveyed by SBE in 2010 and 2022 (SBE, 2011 & SBE, 2022), although the results of these surveys are now considered 'out of date' and the redline boundary has since been amended to include additional field parcels to the south/southwest. An updated survey to establish the current ecological conditions and identify any ecological constraints or opportunities at the site is therefore required to inform the RLDP promotion.

1.2 The candidate site is located directly south of the A4226 Port Road West carriageway and to the east of Cwm-ciddy Lane, in the western extent of Barry (central grid reference: ST 09498 68233, see Site Location Plan in Appendix I). The site covers an area of approximately 18ha and comprises six adjacent agricultural field parcels with associated boundary hedgerows, treelines and fences. There are no buildings or structures within the site boundaries although existing residential development can be found to the east, with farmhouses/farm buildings found to the west. Elsewhere outside the site boundaries, further agricultural farmland lies to the north and west, with a block of woodland bordering to the southeast.

1.3 The current report presents the findings of an ecological desk study and Extended Phase 1 Habitat survey undertaken at the site in April 2025. The current report provides an update to the ecological conditions previously established at the site in 2022, as well as identifying any potential ecological constraints/opportunities associated with the proposed residential development at the site.

2.0 METHODOLOGY

2.1 In order to establish the current ecological conditions at the site and adjacent habitats, a combination of desk-based consultation and Extended Phase 1 Habitat Survey were undertaken in April 2025.

Desk study

2.2 The desk study involved consultation with the South East Wales Biodiversity Records Centre (SEWBReC) , the National Biodiversity Network Trust (NBN) Atlas[1] and the DEFRA 'MAGIC' interactive mapping tool[2] to identify any records of rare, protected or notable flora and fauna at the site and within a radius of 1km (extended to 2km for bats as per the Bat Conservation Trust's good practice guidelines) extending from the central point of the site (Appendix II). The search criteria also included information relating to the location and citation details (where available) for any sites designated for their nature conservation interest such as Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) or Sites of Importance for Nature Conservation (SINCs). The desk study also included a review of the previous ecological survey work and reporting undertaken by SBE in 2022 (SBE, 2022).

Extended Phase 1 Habitat Survey

2.3 The fieldwork was undertaken on 11th April 2025 by a suitably experienced ecologist[3] and followed standard Phase 1 Habitat Survey protocol (JNCC, 2010 & Institute of Environmental Assessment, 1995). All habitats within and immediately adjacent to the site boundaries, were classified and mapped as accurately as possible. Habitats considered to have potential to support rare, protected or otherwise notable species of flora and fauna were noted, as were any direct signs of these species (e.g. Eurasian badger *Meles meles* setts and dung-pits). Incidental observations of birds on or flying over the site were also recorded and any incidence of invasive weed species (e.g. Japanese knotweed *Fallopia japonica*) noted.

2.4 A map of habitats was drawn up and if required, target notes were used to identify features of ecological interest. Where possible, habitats were cross-referenced to any relevant important UK or Wales priority habitats as identified under Section 7 of the Environment Act (Wales) 2016 as well as local habitats adopted by the Vale of Glamorgan Council Local Biodiversity Action Plan (LBAP). Any habitats present at the site were also assessed against the current SINC selection guidelines/criteria as set out in the '*Guidelines for the Selection of Wildlife Sites in South Wales'* document (Gwent Wildlife Trust, 2004).

[1] NBN Atlas: https://nbnatlas.org/
[2] Magic Map Application: https://magic.defra.gov.uk/magicmap.aspx
[3] Associate Member of the Chartered Institute of Ecology & Environmental Management (CIEEM), with experience of habitat and protected species surveys and previous knowledge of the candidate site

2.5 During the field survey any trees found within or directly adjacent to the site boundaries were assessed for their potential to support roosting bats and were categorised in relation to the bat roosting features (BCT, 2023). The categories are as follows:

- **PRF-I –** Potential Roost Feature (PRF) is only suitable for individual bats or very small numbers of bats either due to their size or lack of suitable surrounding habitats**;**
- **PRF-M** - PRF is suitable for multiple bats and may therefore be used by a maternity colony;
- **Negligible** – Negligible habitat features on site likely to be used by roosting bat.

Survey Constraints

2.6 SEWBReC records are not exhaustive, and therefore the absence of records does not necessarily demonstrate the absence of species in any given area. However, in combination with the site survey work and the surrounding land use within and adjacent to the scheme footprint, the desk study information was considered appropriate to inform the ecological appraisal.

2.7 Ecological surveys are limited by several factors which affect the presence of plants and animals such as the time of year, migration patterns, weather conditions and behaviour. The ecological survey undertaken to support this PEA should not therefore be considered as an exhaustive list of plants and animals at the site, and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

2.8 No other constraints were encountered during the survey work.

3.0 RESULTS

Desk Study

Designated Sites

3.1 The Consultation with SEWBReC and the DEFRA Magic Map confirmed that the candidate site does not lie within or directly adjacent to any statutory sites designated for nature conservation (e.g. SSSIs or SACs). Several statutory designations can be found within a 5km radius of the candidate site boundaries (see Table 1 and Appendix II), although none of these were considered of relevance to the proposal given their physical separation from the candidate site, as well as their designating features which mostly consist of important habitats, vegetation and geological records/formations which would not be affected by the proposed development of the candidate site.

Table 1 – Statutory designated sites within 5km radius

Site Name	Citation	Location/Distance from Site
Fferm Walters SSSI	Fferm Walters comprises a series of fields on the western edge of Barry and is of special interest for its exceptionally large area of species-rich neutral grassland, most of which has a particularly calcicolous nature and is one of the rarest types of grassland in Wales. Part of this grassland is undergoing restoration. The grassland is associated with woodland, hedgerows, scrub and smaller areas of damp grassland.	Approx 250m to the north of the candidate site
Coedydd Y Barri/Barry Woodlands SSSI	Coedydd Y Barri/Barry Woodlands is of special interest for its semi-natural broadleaved woodland, some of which is listed as ancient semi-natural woodland (ASNW). The SSSI comprises a series of fourteen separate woodland blocks split into two group about 3km apart, centred on Pencoedtre Wood and Middleton Wood, on the northern and western outskirts of Barry. Most of the woodlands are associated with clayey, often waterlogged, moderately base rich lowland soils that in Wales are almost entirely restricted to the Vale of Glamorgan. Long-established woodland on this particular soil-type gives rise to ash-dominated woodland that supports a rich ground flora. This series of woodlands is the best example of this habitat in Wales.	Nearest parcel of SSSI found approx. 350m to northwest of candidate site
Cliff Wood – Golden Stairs SSSI	The best example of a mixed woodland in South Glamorgan with an interesting, ungrazed ground flora and wooded cliff areas which	Approx 550m south of the candidate site

	supports Purple Gromwell *Lithospermum purpurocaeruleum*, a plant restricted to a very small number of sites in the county.	
Barry Island SSSI	Site of geological importance - the locality is unique in showing a spectacular exposure of marginal Triassic facies.	Nearest parcel of SSSI lies approx. 1.9km to southeast of candidate site
Hayes Point to Bendrick Rock SSSI	Site of geological importance - 1.8 km stretch of coastline to the south east of Barry. The whole length of the cliff line and foreshore provides excellent exposures through important rock sections of Triassic age while the vicinity of Bendrick Rock is one of the best localities in Britain for fossil footprints.	Approx 3.5km to southeast of candidate site
Nant Whitton Woodlands SSSI	A narrow strip of woodland on a Liassic limestone slope in the Vale of Glamorgan. The ground flora is dominated by herbs characteristic of base-rich soils, including the uncommon *Paris Quadrifolia* and *Ophioglossum vulgatum.*	Approx. 4.5km to northwest of candidate site

3.2 The desk study also identified a total of 9no. non-statutory designated sites found within a 1km radius of the candidate site boundaries (see Table 2 and Appendix II). Of these, only North East of Knock Man Down Wood Site of Importance to Nature Conservation (SINC) was considered to be of relevance to the proposal, with this SINC found directly adjacent to the candidate site's eastern/southeastern boundary. This locally designated site covers an area of ancient semi-natural woodland which falls within the grounds of the Porthkerry Country Park. Any future development at the candidate site will need to consider the potential for direct (e.g. through impacts to overhanging trees etc.) and indirect (e.g. through additional lighting requirements, recreational use by walkers or possible surface water run-off) impacts to this adjacent woodland. The remaining non-statutory designated sites were not considered to be of relevance to the proposal given their physical separation from the candidate site as well as their designated features which consist of priority habitats which would not be affected by any future development at the candidate site.

Table 2 – Non-statutory designated sites within 1km radius

Site Name	**Citation**	**Location/Distance from Site**
North East of Knock Man Down Wood SINC	A large area of semi-natural broadleaved woodland which occupies much of the steeply sloping valley sides in the north of Porthkerry Country Park. The extensive woodland is well established with a diverse	Site lies directly adjacent to candidate site's eastern /

	and well-structured understory and species-rich ground flora. Listed as an Ancient Semi-natural Woodland site.	southeastern boundary.
South of Cwm Ciddy Farm SINC	A small rectangular block of species-rich semi-improved neutral grassland found on the upper slopes of a dry valley.	Approx. 100m southwest of candidate site.
Walters Farm SINC	A complex of field parcels, part of which fall within the Fferm Walters SSSI boundaries. The fields are known to support particularly species-rich neutral grassland although are currently recovering having been recently ploughed and drilled.	Approx. 250m north of the candidate site
West of Barry College SINC	Neutral grassland pasture of exceptional species-diversity and richness, bordered on all sides by established woodland and hedgerows.	Approx. 350m north of the candidate site
North Cwm Barri SINC	A linear block of semi-natural broadleaved woodland situated on a steep northernly facing slope. Barry Brook flows along the northern boundary of the wood, with Cliff Wood (SSSI) bordering to the west.	Approx. 500m south of the candidate site.
Cliff Wood – Golden Stairs Local Nature Reserve (LNR)	A Local Nature Reserve sited within the Porthkerry Country Park. Also designated as a SSSI (see Table 1 above).	Approx. 550m south of the candidate site.
Cwm Talwg Woodlands LNR	A Local Nature Reserve in the northwest of Barry, 2.85 ha of mature deciduous woodland managed by the Cwm Talwg Woodlands Residents Group.	Approx. 625m east of the candidate site.
Knock Man Down Wood SINC	A rectangular block of semi-natural broadleaved woodland situated between the railway line and open grasslands of Porthkerry Country Park.	Approx. 700m southwest of the candidate site.
North West of Welsh Hawking Centre SINC	A small block of semi-natural broadleaved woodland bordered to the north by the Brynhill Barry Golf Club, to the east and west by solar farm developments and to the south by grazing pastures.	Approx. 875m north of candidate site

3.3 A number of Ancient Semi-natural Woodland (ASNW) parcels were also returned within the 1km search radius (see Appendix II). This included the parcel of woodland found directly adjacent to the candidate site's eastern/southeastern boundary, which as mentioned above is also locally designated as the North East of Knock Man Down Wood SINC. ASNW sites are areas that have been wooded continuously since at least 1600 AD. They are defined as irreplaceable habitats that are a valuable natural asset and are important for a wide array of wildlife (including rare and threatened species); soils; carbon capture and storage; contributing to the seed

bank and genetic diversity of British flora; recreation, health and wellbeing; and for cultural, historical and landscape value. No other ancient woodland parcels found in the local area would be affected by any future development at the candidate site.

3.4 The southern section of the candidate site also falls within the 'B-Lines' network. This is an initiative run by Buglife which involves the identification and restoration of 'insect pathways' throughout British cities, towns and countryside by creating a series of wildflower-rich habitat steppingstones. The B-Lines initiative is not afforded any legal protection but is considered of relevance to the site and appropriate opportunities for enhancement should be considered as part of any future development.

Protected/priority Listed Species

3.5 A review of SEWBReC records revealed a number of protected/priority species records within the local area. This included a list of foraging and commuting bats recorded within a 2km radius of the site with species known to be present in the area including Noctule *Nyctalus noctula*, Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Whiskered Bat *Myotis mystacinus*, Daubenton's Bat *Myotis daubentonii*, Serotine *Eptesicus serotinus* and Brown Long-eared Bat *Plecotus auritus*. Many of these records were associated with the woodland found adjacent to the site's eastern boundary (North East of Knock Man Down Wood) and with other habitats found within wider grounds of Porthkerry Country Park, indicating their importance to local bat populations. The nearest known bat roost, a small pipistrelle day-roost, was associated with a farmhouse found on the far side of Cwm Ciddy Lane, less than 50m from the site boundaries.

3.6 Several other notable mammal species have been recorded in the local area, with a single record (dated 2013) of Hazel Dormouse *Muscardinus avellanarius* associated with the site itself. This record relates to a dormouse nest, presumably found within one of the field boundaries/hedgerows, although the exact location of the nest is not specified. There are no confirmed or unconfirmed records for this species at the site on the NBN Atlas. Otters *Lutra lutra* have also been recorded in close proximity to the candidate site with several recent records, including sightings and camera trap footage, associated with the nearby Nant Talwg watercourse which runs through the parcel of woodland adjacent to the candidate site's eastern boundary. Badger *Meles meles* are also known to inhabit the various woodlands parcels which make up Porthkerry County Park, with at least one known sett found within a 1km radius of the candidate site. Other priority/protected mammals found within the 1km search radius include records for Hedgehog *Erinaceus europaeus* and Polecat *Mustela putorius*.

3.7 Records of herpetofauna (reptiles and amphibians) found within a 1km radius of the site include those for Common Frog *Rana temporaria*, Common Toad *Bufo bufo*, Smooth Newt *Lissotriton vulgaris*, Adder *Vipera berus* and Slow Worm *Anguis fragilis* – both Slow Worm and Common Frog have previously been recorded within

the candidate site boundaries. Neither the SEWBReC records nor the NBN Atlas data revealed any records of Great Crested Newt *Triturus cristatus* within a 1km radius of the site.

3.8 The desk study identified a number of bird species listed under Schedule 1 of the Wildlife & Countryside Act (1981) (as amended) found within 1km of the site including Hobby *Falco Subbuteo*, Peregrine *Falco peregrinus*, Merlin *Falco columbarius*, Barn Owl *Tyto alba*, Redwing *Turdus iliacus*, Fieldfare *Turdus pilaris*. The data search also included an extensive list of Priority bird species listed under Section 7 of the Environmental Act (Wales) 2016 that have previously been recorded within 1km of the site. While not all of these were considered of relevance to the scheme, based on the limited number of habitats present at the application site, the hedgerows and boundary woodland are likely to provide nesting opportunities for a range of priority listed tree/scrub nesting species (e.g. Song Thrush *Turdus philomelos* and Bullfinch *Pyrrhula pyrrhula*).

3.9 A total of 17no. records of priority invertebrates listed under Section 7 of the Environmental Act (Wales) 2016 have been recorded within a 1km radius of the site, including those for at least 11no. different species – none of these were associated with habitats found within the candidate site boundaries.

3.10 A small number of invasive fauna and flora records listed under Schedule 9 of the Wildlife and Countryside Act (1981) (as amended) have been recorded in the local area including those for Canada Goose *Branta canadensis*, *Cotoneaster sp*., Japanese Knotweed, Three-cornered Garlic *Allium triquetrum* and Himalayan Balsam *Impatiens glandulifera*.

2022 Survey work (SBE)

Three field parcels found in the northeast of the current candidate site boundaries, along with the Weycock Cross roundabout island and short distances along the adjacent A4226 and B4266 carriageways, were subject to an Extended Phase 1 Habitat survey in May 2022. This survey identified a limited number of habitat types, consistent with the site's agricultural use at that point in time. This included S7 priority habitats in hedgerows, as well as broadleaved trees, drainage ditches, arable fields, poor semi-improved grassland, dense scrub, tall ruderal and ephemeral/short perennial vegetation, amenity grassland and hardstanding. The distribution and type of habitats were generally consistent with those recorded during previous survey work undertaken in 2010/11 (SBE 2011). The habitats present at the site were considered suitable of supporting foraging and commuting bats, both ground and tree/shrub nesting birds, common herpetofauna (reptiles and amphibians) and potentially Hazel Dormice (if source population is present in the local area). No direct evidence of Badger was found within the site boundaries, although the occasional use of the site by foraging/commuting Badger was considered likely based on the availability of suitable habitat.

Extended Phase 1 Habitat Survey

3.11 The distribution and extent of habitats recorded at the site in April 2025 are illustrated on the Extended Phase 1 Habitat Plan included within Appendix III. The Extended Phase 1 Habitat survey revealed that the site supports a limited range of habitats, with conditions in the northeast of the site consistent with what was recorded/mapped in 2022. A description of each of these habitats can be found below:

Arable

3.12 Five of the candidate site's six field parcels (field parcels 1 – 5) are currently utilised as arable land and at the time of the survey had been drilled with a mixture of what appears to be wheat and non-cereal crops (see image on front cover page). Field locations can be seen on the Field and Hedgerow Plan included in Appendix IV. These findings are largely consistent with what was recorded at the site in 2022, although at that point in time the arable fields were used to grow silage, with cattle present in the southern field parcels. These arable fields were considered to hold little to no ecological value and represent the most suitable areas of the candidate site for any proposed development.

Improved Grassland

3.13 The remaining field parcel (field parcel 6 – see Appendix IV & Plate 1) contained improved grassland, although it was not clear if this field was used as a pasture (no livestock were present at the time of the survey) or if the grass was being grown for silage. The grassland was dominated by Rye-grasses *Lolium spp*. and was characterised by its short sward height and low floral diversity, with any herbaceous species present limited to those known to be tolerant of high stress/high nutrient environments such as Common Dandelion *Taraxacum officinale*, Broadleaved Dock *Rumex obtusifolius*, Common Daisy *Bellis perennis*, Ribwort Plantain *Plantago lanceolata*, White Clover *Trifolium repens*, Creeping Buttercup *Ranunculus repens*, Meadow Buttercup *Ranunculus acris*, Creeping Cinquefoil *Potentilla reptans*, Silverweed *Potentilla anserina*, Common Mouse-ear *Cerastium fontanum*, Bristly Ox-tongue *Helminthotheca echioides*, Common Nettle *Urtica dioica*, Dove's-foot Crane's-bill *Geranium molle* and Red Clover *Trifolium pratense*. This field was also considered to hold little to no ecological value.

3.14 A strip of improved grassland approximately 25m in width can also be found along the eastern margin/boundary of field parcel 3 (see Target Note 6). This was similar in appearance and species assemblage to the improved grassland in field parcel 6.

Plate 1 – Improved grassland within Field Parcel 6

Poor Semi-improved Grassland

3.15 Narrow strips of poor semi-improved grassland are present along many of the arable field margins/boundaries (see Target Note 2). These ranged in size from less than 0.5m to a maximum of approximately 1m in width and appeared to be largely unmanaged. These grassy strips contained tussocky grasses such as Cocksfoot Grass *Dactylis glomerata*, False Oat-grass *Arrhenatherum elatius*, Meadow Foxtail *Alopecurus pratensis*, Yorkshire Fog *Holcus lanatus* and Annual Meadow *Grass Poa* annua, with other species recorded including Common Nettle, Common Dandelion, Broadleaved Dock, Selfheal *Prunella vulgaris*, Meadow Buttercup, Herb Robert *Geranium robertianum*, Cleavers *Galium aparine*, Field Forget-me-not *Myosotis arvensis*, Creeping Thistle *Cirsium arvense*, Ground-ivy *Glechoma hederacea*, Hogweed *Heracleum sphondylium*, Germander Speedwell *Veronica chamaedrys*, Silverweed, Common Mouse-ear, Dove's-foot Crane's-bill, Creeping Cinquefoil, Red Clover, Soft Rush *Juncus effusus* and Common Vetch *Vicia sativa*. Several ornamental species (likely garden escapees) such as Spanish Bluebell *Hyacinthoides hispanica*, other *Hyacinth spp*. and Daffodil *Narcissus sp*., were also noted along the arable field margins which border upon residential gardens in the east/northeast of the site. Arable field margins are listed as Priority Habitats under Section 7 of the Environment (Wales) Act 2016 although those present at the Candidate site did not support any notable plant species at the time of the current survey and were too small to map on the Extended Phase 1 Habitat Plan included in Appendix III.

Dense/Scattered Scrub

3.16 A wet drainage ditch intersects the middle of the site, and the eastern extent of this ditch supports dense scrub vegetation along its banks (see Target Note 5). This scrub comprised mostly of young strands of Ash *Fraxinus excelsior*, Hawthorn *Crataegus monogyna*, Field Maple *Acer campestre* and Elder *Sambucus nigra* that

were connected by an continuous understory of Bramble *Rubus fruticosus* thickets, Common Nettle, Rose *Rosa sp*. and Red Currant *Ribes rubrum*. The ground flora associated with these scrubby banks was heavily shaded and supported species typical of woodland environments such as Lesser Celandine *Ficaria verna*, Stinking Iris *Iris foetidissima*, Lord's-and-ladies *Arum maculatum*, Ivy *Hedera helix*, Hart's-tongue Fern *Asplenium scolopendrium*, Cleavers, Herb Robert, Male Fern *Dryopteris filix-mas* and Hogweed. A second parcel of scrub consisting entirely of a dense Bramble thicket can also be found bordering the site to the northwest (see Target Note 13).

Running Water

3.17 As mentioned above, a wet drainage ditch can be found flowing eastwards through the middle of the candidate site (see Target Notes 4, 5 & 7 and Plate 2). The majority of this watercourse was heavily shaded from surrounding vegetation and contained only a small trickle of running water, although the survey was undertaken following a prolonged period of dry and warm weather in March/April 2025. The wet ditch appears to enter the site through a culvert located near the site's western boundary and leaves the site through a second culvert found near the eastern boundary, where it presumably then links to the nearby Nant Talwg watercourse to the east. In the western extent of the site, this watercourse sits in a ditch approximately 2m deep, with steep and densely vegetated banks which support marginal vegetation such as Hemlock Water-dropwort *Oenanthe crocata*, Meadowsweet *Filipendula ulmaria*, Lesser Water-parsnip *Berula erecta*, Pendulous Sedge *Carex pendula*, Common Nettle, Hogweed and several unidentified Willowherbs *Epilobium spp*. After flowing through a parcel of dense scrub vegetation, as described in paragraph 3.16, the banks of the stream become far less vegetated as it passes adjacent to residential houses and gardens. This ditch was considered to be of ecological value (in a local context) and is likely used as by a wide range of fauna e.g. as a shaded commuting corridor.

Plate 2 – Wet ditch intersecting the middle of the site

Scattered Broadleaved Trees

3.18 The site contains a small number of broadleaved trees, all of which were associated with the various hedgerows and field boundaries. Species present include Ash, Holly *Ilex aquifolium*, Field Maple, Oak *Quercus sp*. and Hawthorn. The majority of these trees were young/semi-mature although larger and more mature specimens can be found on the banks of the wet ditch near the eastern site boundary (see Target Note 4).

Hedgerows

3.19 The field boundaries are marked by a series of native hedgerows as described in Table 3 below. The location of each hedgerow is marked on the Field and Hedgerow plan included in Appendix IV. The majority of these hedges appear to be regularly managed (e.g. cut/flailed annually), with both species-poor and species-rich examples present at the site – species-poor hedges typically contain less than five woody species in any 30m stretch, with species-rich hedges containing five or more woody species in any given 30m stretch. Species associated with the various hedgerows understories and ground flora layers were generally consistent across the site and included Bramble, Common Nettle, Cow Parsley *Anthriscus sylvestris*, Ivy, Garlic Mustard *Alliaria petiolata*, Creeping Thistle, Cleavers, Lord's-and-ladies, unidentified Willowherbs, Ground-ivy, Selfheal, Herb Robert, Dog Rose *Rosa canina*, Bracken *Pteridium aquilinum*, Traveller's-joy *Clematis vitalba*, Germander Speedwell, Lesser Celandine, Hogweed, Hart'-tongue Fern, Tufted Vetch *Vicia cracca*, False Brome *Brachypodium sylvaticum*, Lesser Burdock *Arctium minus*, Stinking Iris, Wild Parsnip *Pastinaca sativa*, Soft Rush, Bush Vetch *Vicia sepium*, Common Vetch and Meadowsweet. Hedgerows are listed as priority habitats under Section 7 of the Environment (Wales) Act 2016 and represent valuable ecological features.

Table 3 – Hedgerow descriptions

Hedgerow	Description
H1	Intact species-rich hedge found along northern boundary of the site, along A4226 Port Road West carriageway. Managed/cut to approx. 2m high x 1.5m wide and supported by a post and wire fence. Very narrow field margin (<0.5m). Woody species include Hawthorn, Dogwood *Cornus sanguinea*, Field Maple, Hazel *Corylus avellana*, Elder and Blackthorn *Prunus spinosa*. Largely dense and continuous understory although gappy in places.
H2	Intact species-rich hedge found separating F1 and F2/F6. Managed/cut to approx. 1.5/2m high x 1.5m wide and supported by post and wire fence. Very narrow field margins (<0.5m). Dry drainage ditch present along base of hedgerow on eastern side. Similar woody species as H1 plus Spindle *Euonymus europaeus*, Oak and English Elm *Ulmus procera*. Dense and continuous understory layer.
H3	Defunct species-poor found separating F2 & F3. Mosty Bramble with occasional Hawthorn supported by a post and wire fence. Very narrow field margins (<0.5m). Gappy understory. No apparent management.
H4	Defunct species-poor hedgerow found separating F2 & F6. Same description as H3.
H5	Intact species-poor thorny hedgerow found along southern bank of wet ditch, separating F3 & F4. Managed/cut to approx. 1.5m high x 1.5m wide and supported by post and wire fence. Comprised almost entirely of Hawthorn with occasional Elder, Hazel and Blackthorn. Very narrow field margin on southern side (<0.5m), with wet ditch and associated marginal vegetation on northern side. Dense and continuous understory layer. Several well-used mammal pathways intersect hedge.
H6	Intact species-rich hedge found along western boundary of F5. Managed/cut to 1.5m high x 1.5m wide and supported by post and wire fence. Dry ditch along base of hedge on eastern side. Narrow field margin approx. 0.5m in width. Woody species include Hazel, Hawthorn, Blackthorn, Elder, Dogwood and Holly. Dense and continuous understory layer.
H7	Intact species-poor hedgerow found separating F4 & F5. Managed/cut to approx. 1.5m high x 1.5m wide and supported by post and wire fence. Woody species include Hawthorn, Elder, Hazel and Blackthorn. Very narrow field margins either side (<0.5m). Several well-used mammal pathways intersect the hedge. Understory largely dense and continuous with small gappy areas in the east.

H8	Intact species-poor hedgerow found along western boundaries of F4 & F3. Largely managed/cut to approx. 1.5m high x 1.5m wide and supported by post and wire fence, although two short sections of hedgerow contain several semi-mature trees. Woody species are generally limited to Hawthorn, Blackthorn, Spindle and Elder, with Oak and Hazel trees present in short sections. Dry ditch found along base of hedgerow in its northern extent. Very narrow field margins (<0.5m). Largely dense and continuous understory layer.

Semi-natural broadleaved Woodland (Off-site)

3.20 A parcel of semi-natural broadleaved woodland borders the candidate site to the east/southeast (see Plate 3) – the desk study revealed that this woodland is listed as a parcel of ancient semi-natural woodland (ASNW) and is also locally designated as part of the North East of Knock Man Down Wood Site of Importance to Nature Conservation (SINC). This woodland, most of which is set on a steep southernly facing slope, has a continuous canopy layer with trees present including Ash, Sycamore, Sessile Oak *Quercus petraea*, Beech *Fagus sylvatica* and Yew *Taxus baccata*. The woodland has a diverse and well-structured understory comprising Hazel, Hawthorn, Blackthorn, Elder, Wild Privet *Ligustrum vulgare*, Wych Elm *Ulmus glabra*, Field Maple, Honeysuckle *Lonicera periclymenum*, Holly and Red Currant, and a species-rich ground flora layer supporting a diverse array ancient woodland indicator species such as Dog's Mercury *Mercurialis perennis*, Wood Sedge, Early Dog-violet *Viola reichenbachiana*, Pendulous Sedge, Goldilocks Buttercup *Ranunculus auricomus*, Common Bluebell *Hyacinthoides non-scripta*, Soft Shield Fern *Polystichum setiferum*, Primrose *Primula vulgaris*, Enchanter's Nightshade *Circaea lutetiana*, Stinking Iris, Wood Anemone *Anemone nemorosa*, Wood Sanicle *Sanicula europaea*, Wood Speedwell Veronica montana and Barren Strawberry *Potentilla sterilis*. Other more common woodland plants recorded include Lesser Celandine, Ivy, Lord's-and-ladies, Bracken, Hart's-tongue Fern, False Brome, Hard Sheild-fern *Polystichum aculeatum*, Woodland Strawberry *Fragaria vesca* and Wood Avens *Geum urbanum*. Woodlands such as this (lowland mixed deciduous woodland) are listed as Priority Habitats under Section 7 of the Environment (Wales) Act 2016.

Plate 3 – Woodland adjacent to the eastern boundary

Invasive Species

3.21 The survey found instances of Wall Cotoneaster *Cotoneaster horizontalis* growing on garden walls/fences along the northern/northeastern site boundaries (see Target Note 1). This is a non-native invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act (1981) (as amended).

Fauna

3.22 During the course of the survey, a search of field signs for protected or notable species was undertaken and the potential of the habitats to support these species considered. In the context of this report, these species meet any of the following criteria:

- Species protected by British or international law;
- Priority species included on Section 7 (Environment Act, Wales);
- Nationally rare or nationally scarce species;
- Species of Conservation Concern (e.g. JNCC Red List, RSPB/BTO Red or Amber Lists);

Amphibians

3.23 Desk study records revealed that there are no known Great Crested Newt (GCN) populations at the candidate site or within a 1km radius extending from the site boundaries. Furthermore, there are no permanent waterbodies or any other suitable breeding habitats for GCN found at the site, and a review of OS mapping found no known ponds/waterbodies within any of the immediately adjacent habitats (although OS maps data may not include any ornamental ponds that may be present in nearby residential gardens). The majority of the habitats found within the candidate site (i.e. arable farmland) represent unsuitable terrestrial habitat for GCN

and as such this species is not considered to pose a constraint to future development and is therefore not mentioned any further in this report.

3.24 Several common amphibian species have been recorded in the local area with records of Common Frog associated with habitats found within the site boundaries. The boundary hedgerows and woodland margin likely provide suitable habitat for common amphibians during their terrestrial phase. While there are no specific mitigation or licensing requirements for common amphibians, a precautionary approach to any required vegetation clearance (i.e. hedgerows and field margins) should be adopted as part of any proposed development.

Badger

3.25 SEWBReC records confirmed the presence of at least one known Badger clan/family group within the woodlands found directly south of the candidate site. While the current survey found no Badger setts within or directly adjacent to the site boundaries (extending 30m into the adjacent woodland), evidence of Badger activity was identified within the site boundaries (see Target Notes 9 and 10). These were mostly associated with the southern extent of the site (near the boundary woodland) included a latrine containing fresh dung as well as a well-used pathway leading under a boundary fence, with Badger guard hairs found caught in this fence. Several other well-used small mammal pathways were noted across the candidate site, with these generally associated with the field margins and boundary hedgerows. Based on the survey findings, the site is believed to fall within the home range of a local Badger family group and is therefore likely subject to occasional/irregular use (e.g. for foraging purposes).

Bats

3.26 During the survey any trees found at (e.g. within boundary hedgerows) or directly adjacent to the site were assessed for their potential to support roosting bats. A total of three trees were considered suitable for use by roosting bats (see Target Notes 4 & 12), with two of these found on the banks of the wet ditch in the eastern extent of the site and one found within the western boundary hedgerow. This included a mature Ash with numerous woodpecker holes, areas of deadwood and a vertical split (High roosting potential/PRF-M), a mature Oak which supported areas of standing deadwood (Low roosting potential/PRF-I) and a semi-mature Oak covered in a dense layer of Ivy which have concealed other potential roosting features (Low roosting potential/PRF-I). Any other trees were either relatively young in age with narrow trunks/limbs or were in good condition with no obvious potential roosting features that bats could utilise – i.e. Negligible roosting potential. Any trees found along/within the boundary woodland to the south were not assessed during the current survey due to the large number of trees present, and so any future works to these trees would first require further

scoping works for roosting bats. There are no buildings/structures or any other features at the site which could support roosting bats.

3.27 While the arable and improved grassland field parcels likely provide limited foraging resources for bats, the hedgerows, woodland edge and vegetated wet ditch represent more suitable foraging habitats, with these boundary features also likely to be used as commuting corridors, allowing undisturbed travel across the site and between different foraging grounds in the local area. Any loss of or breach through these boundary features therefore has the potential to impact local bat populations in the absence of mitigation/enhancement.

Birds

3.28 During the survey a number of bird species were heard/seen flying over or within the habitats present at the site including Jackdaw *Coloeus monedula*, Collared Dove *Streptopelia decaocto*, Wood Pigeon *Columba palumbus*, House Sparrow *Passer domesticus*, Carrion Crow *Corvus corone*, Robin *Erithacus rubecula*, Goldfinch *Carduelis carduelis*, Magpie *Pica pica*, Wren *Troglodytes troglodytes*, Blue Tit *Cyanistes caeruleus*, Blackbird *Turdus merula*, Blackcap *Sylvia atricapilla*, Nuthatch *Sitta europaea*, Chiffchaff *Phylloscopus collybita*, Song Thrush *Turdus philomelos* and Skylark *Alauda arvensis*. Of the species noted, Skylark, House Sparrow and Song Thrush are listed as Priority bird species under Section 7 of the Environmental Act (Wales) 2016. The species recorded at the site were considered typical of the setting (i.e. agricultural farmland/woodland) although would not be considered representative of the full range of species that the candidate site could potentially support (i.e., during the breeding season or over-wintering). The boundary hedgerows, dense scrub and woodland edge are likely to support a wide array of tree/shrub nesting species. The large open field parcels may also support ground nesting species, particularly later in the season when any crops may be more established/taller and subsequently offer more cover – during the survey a single Skylark was observed calling above field parcel 5, with Skylarks also observed at the site during the 2022 survey visit.

Hazel Dormouse

3.29 The SEWBReC search data revealed that a single dormouse nest has previously be found within the candidate sit boundaries in 2013, although this record does not specify which boundary/hedge this nest was associated with. A review of the NBN Atlas found no records of dormouse at the site or within any of the adjoining habitats, although this species is known to occur in inhabit woodlands found in the southern extent of Barry. No evidence of Hazel Dormice (e.g. Hazel nuts with characteristic signs of being gnawed by Dormouse) was found at the site during the current or previous (2022) survey visits. While most of the hedgerows found at the site are managed, they do contain numerous potential food resources for dormice (e.g. Hathorn, Hazel, Blackthorn, Elder, Oak and Bramble) and largely have sufficient structures to support occasional use by this species, with dense and continuous understory layers. The woodland found adjacent to the south/southeastern

site boundaries is also large enough to support a source population of dormice and represents good quality habitat for this species. As such, the potential presence of dormice at the site will need to be considered by any future development.

Otter & Water Vole

3.30 SEWBReC records revealed that Otter have recently been recorded along the nearby Nant Talwg watercourse, which flows through the parcel of woodland found directly adjacent to the candidate site's eastern/southeastern boundary – at its closest point, this stream sits approximately 90m from the site boundaries. Any development in close proximity to this boundary woodland will therefore need to consider potential impacts to this species e.g. through increased illumination of the woodland/stream corridor or through the accidental discharge of surface water run-off, pollutants etc into the stream.

3.31 During the survey an Otter paw print was found on the banks of the wet ditch which intersects the centre of the site (see Plate 4 and Target Note 5). This wet ditch is believed to outfall into the Nant Talwg watercourse through a culvert on the eastern site boundary. This finding indicates that Otters use the wet ditch, perhaps for commuting purposes between different foraging ground or watercourses, although any use of this ditch is likely to be on an irregular/infrequent basis only. This is due to the small size/shallow nature of the ditch, which likely dries out during the summer months and therefore is unlikely to contain sufficient prey resources to support regular use by Otter. The eastern section of the ditch is also exposed and overlooked by residential houses and gardens, further reducing this features suitability for regular use. No features indicative of a holt, couch or resting spot were noted along the length of the wet ditch.

Plate 4 – Otter print on banks of wet ditch

3.32 The SEWBReC search data found no records of Water Vole *Arvicola amphibious* within a 1km radius of the candidate site boundaries. A review of the NBN Atlas revealed that the nearest known (unconfirmed) record of Water Vole was associated with a stretch of the River Weycock, approximately 2km from the site boundaries. The habitats found within the site boundaries were also considered to be generally unsuitable for use by Water Vole – the wet ditch was heavily shaded, small/shallow in nature and likely to dry often, largely has gently sloping banks which are suboptimal for burrowing and is lacking is ample marginal vegetation to support this species. As such Water Vole are not considered to pose a constraint to future development and are therefore not considered any further in this report.

Reptiles

3.33 The desk study revealed that several species of reptile have previously been recorded in the local area, with records of Slow Worms dated from 2013 associated with habitats found within the current candidate site boundaries. Despite the local records, the site in its current condition is considered to represent sub-optimal habitat for common reptiles. The field parcels likely provide very little in terms of prey/foraging resources and contain no features suitable for shelter/refugia or basking. The unmanaged field margins, wet ditch, hedgerows and woodland edge represent more suitable habitats, providing foraging/sheltering/basking opportunities, although the use of these features by anything more than individual/small numbers of reptiles was considered to be unlikely.

Terrestrial Invertebrates

3.34 During the survey a small number of invertebrate species were observed at the candidate site including Orange-tip *Anthocharis cardamines*, Small White *Pieris rapae* & Speckled Wood *Pararge aegeria* butterflies – none of which hold any conservation status. While the arable and improved grassland field parcels are likely to be unsuitable of supporting a wide range of terrestrial invertebrates, the hedgerows, vegetated wet ditch and boundary woodland likely support a greater number of invertebrates in context of the site. The desk study revealed that several priority listed invertebrates have previously been recorded within the adjacent ancient woodland parcel to the south (North East of Knock Man Down Wood SINC).

Other Species

3.35 The desk study revealed that both Hedgehog and Polecat have previously been recorded in close proximity to the site. The hedgerows and boundary woodland were considered suitable for use by both of these priority listed species, at least on an occasional or irregular basis.

4.0 POLICIES AND PLANS

4.1 The following local and national planning policy relating to nature conservation and biodiversity are considered of relevance to the site.

Planning Policy Wales (2024)

4.2 This document set out the land use planning policies of the Welsh Government with Chapter 6 dealing with Distinctive and Natural Places which covers Biodiversity and Ecological Networks. The advice contained within PPW is supplemented for some subjects by Technical Advice Notes (TAN's), with TAN 5 addressing Nature Conservation & Planning.

4.3 TAN 5 identifies a number of key principles, which the town and country planning system in Wales should consider. Those relevant are detailed below:

- *Work to achieve nature conservation objectives through a partnership between local planning authorities, Natural Resources Wales (NRW), voluntary organisations, developers, landowners and other key stakeholders;*
- *Integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time;*
- *Ensure that the UK's international obligations for site, species and habitat protection are fully met in all planning decisions;*
- *Look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally;*
- *Promoting approaches to development which create new opportunities to enhance biodiversity, prevent biodiversity losses, or compensate for losses where damage is unavoidable. Minimising or reversing the fragmentation of habitats and improving habitat connectivity through the promotion of wildlife corridors;*
- *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;*
- *The presence of a species protected under European or UK legislation is a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat.*

Updates to PPW Chapter 6: Distinctive and Natural Places (October 2023)

4.4 An updated version of PPW: Chapter 6 was published with immediate effect on 11th October 2023 in a published letter to Local Authorities from Julie James AS/MS – Minister for Climate Change[4]. These changes have now been incorporated as part of the latest edition (February 2024) of PPW. The new guidance provides an update on Net Benefit for Biodiversity and the Step-wise Approach, with extracts considered of relevance to the development site provided below:

Maintaining and Enhancing Biodiversity

4.5 Planning authorities must follow a step- wise approach to maintain and enhance biodiversity, build resilient ecological networks and deliver net benefits for biodiversity by ensuring that any adverse environmental effects are firstly avoided, then minimized, mitigated, and as a last resort compensated for. Enhancement must be secured by delivering a biodiversity benefit primarily on site or immediately adjacent to the site, over and above that required to mitigate or compensate for any negative impact.

4.6 All development must deliver a net benefit for biodiversity and ecosystem resilience from the baseline state (proportionate to the scale and nature of the development proposed). Even if the biodiversity value has been maintained, there must still be a pro-active process to look for and secure enhancement through the design and implementation of the development.

Environment (Wales) Act, 2016

4.7 Part 1 of the Environment Act Wales came into force in May 2016 and sets out the approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

Section 6 - Biodiversity and resilience of ecosystems duty

4.8 Section 6 of the Act places a duty on public authorities to 'seek to maintain and enhance biodiversity' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to 'promote the resilience of ecosystems'.

Section 7 - Biodiversity lists and duty to take steps to maintain and enhance biodiversity

4.9 This section lists living organisms and types of habitat in Wales which are considered of key significance to maintaining and enhancing biodiversity in relation to Wales. The Welsh Ministers are required to take all reasonable steps to

[4] Published letter from Julie James AS/MS (Minister for Climate Change) to Local Authorities – Heads of Planning. Reference: MA/JJ/2512/23. Dated 11th October 2023.

maintain and enhance the living organisms and types of habitat included in any list published under this section, and encourage others to take such steps.

Local Planning Policy

Vale of Glamorgan Council Local Development Plan 2011 – 2026

4.10 The Vale of Glamorgan Local Development Plan (LDP) 2011-2026 provides the local planning policy framework for the Vale of Glamorgan and was adopted by the Council on 28th June 2017. The Plan sets out the vision, objectives, strategy and policies for managing development in the Vale of Glamorgan and contains a number of local planning policies and makes provision for the use of land for the purposes of housing, employment, retailing, recreation, transport, tourism, minerals, waste, and community uses. A new Replacement Local Development Plan (RLDP) (2021 – 2036) is currently in review. Policies within the current LDP relating to biodiversity, and considered of relevance to the site proposals, are listed below.

Policy SP10 – Built and Natural Environment

Development proposals must preserve and where appropriate enhance the rich and diverse built and natural environment and heritage of the Vale of Glamorgan including:

1. The architectural and / or historic qualities of buildings or conservation areas, including locally listed buildings;

2. Historic landscapes, parks and gardens;

3. Special landscape areas;

4. The Glamorgan Heritage Coast;

5. Sites designated for their local, national and European nature conservation importance; and

6. Important archaeological and geological features.

Policy MG19 – Sites and Species of European Importance

Development proposals likely to have a significant effect on a European site, when considered alone or in combination with other projects or plans will only be permitted where:

1. The proposal is directly connected with or necessary for the protection, enhancement and positive management of the site for conservation purpose; or

2. The proposal will not adversely affect the integrity of the site;

3. There is no alternative solution;

4. There are reasons of overriding public interest; and

5. Appropriate compensatory measures are secured.

Development proposals likely to have an adverse effect on a European protected species will only be permitted where:

1. There are reasons of overriding public interest;

2. There is no satisfactory alternative; and

3. The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

POLICY MG20 – Nationally Protected Sites and Species

Development likely to have an adverse effect either directly or indirectly on the conservation value of a site of special scientific interest will only be permitted where it is demonstrated that:

1. There is no suitable alternative to the proposed development; and

2. It can be demonstrated that the benefits from the development clearly outweigh the special interest of the site; and

3. Appropriate compensatory measures are secured; or

4. The proposal contributes to the protection, enhancement or positive management of the site.

Development proposals likely to affect protected species will only be permitted where it is demonstrated that:

1. The population range and distribution of the species will not be adversely impacted;

2. There is no suitable alternative to the proposed development;

3. The benefits of the development clearly outweigh the adverse impacts on the protected species; and

4. Appropriate avoidance, mitigation and compensation measures are provided.

POLICY MG21 –Sites of Importance for Nature Conservation, Regionally Important Geological and Geomorphological Sites and Priority Habitats and Species

Development proposals likely to have an adverse impact on sites of importance for nature conservation or priority habitats and species will only be permitted where it can be demonstrated that:

1. The need for the development clearly outweighs the nature conservation value of the site;

2. Adverse impacts on nature conservation and geological features can be avoided;

3. Appropriate and proportionate mitigation and compensation measures can be provided; and

4. The development conserves and where possible enhances biodiversity interests.

POLICY MD7 – Environmental Protection

Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from either:

1. Pollution of land, surface water, ground water and the air;

2. Land contamination;

3. Hazardous substances;

4. Noise, vibration, odour nuisance and light pollution;

5. Flood risk and consequences;

6. Coastal erosion or land stability;

7. The loss of the best and most versatile agricultural land; or

8. Any other identified risk to public health and safety.

Where impacts are identified the Council will require applicants to demonstrate that appropriate measures can be taken to minimise the impact identified to an acceptable level. Planning conditions may be imposed or legal obligation entered into, to secure any necessary mitigation and monitoring processes.

In respect of flood risk, new developments will be expected to avoid unnecessary flood risk and meet the requirements of TAN15. No highly vulnerable development will be permitted within Development Advice Map (DAM) zone C2. Development will only be permitted in areas at risk of flooding where it can be demonstrated that the site can comply with the justification and assessment requirements set out in TAN15.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 The combination of desk study and Extended Phase 1 Habitat survey undertaken at the site in April 2025 identified a limited range of habitats, with conditions at the site broadly consistent with what was recorded/mapped in 2022. The site comprises of six agricultural field parcels containing arable crops and improved grassland – these field parcels were considered to hold little to no ecological value and represent the most suited areas for any future development. A series of hedgerows, ditches, dense scrub and woodland border these field parcels, and these represent more valuable habitats/features in a local context, with native hedgerows and lowland deciduous woodland both listed as Priority Habitats under Section 7 of the Environment Act (Wales) 2016. These features should be retained as far as practicable as part of any proposed development layout. Other than the boundary woodland, which has already been designed as part of the North East of Knock Man Down Wood SINC, there are no other habitats found within the site boundaries that would qualify for consideration as a SINC under the current selection guidelines/criteria (Gwent Wildlife Trust, 2004).

5.2 The habitats found at the site were considered capable of supporting foraging/commuting/roosting bats, both tree/shrub and ground nesting bird species, small numbers of common herpetofauna (reptiles and amphibians), Hazel Dormouse, Otter (on an irregular basis) and other small mammals. Evidence of Badger was also found at the site, with the site believed to fall within the home territory of a local badger family group. While no plans were available at the time of writing this report, the following avoidance, mitigation and compensation measures would be considered appropriate for any future development at the candidate site:

Ancient Woodland & Designated Sites

5.3 The parcel of broadleaved woodland found along the candidate site's eastern/southeastern boundary is listed as an Ancient Semi-natural Woodland site, with this woodland also locally designated as a SINC. Ancient woodland takes hundreds of years to form and is defined as an irreplaceable habitat. Planning Policy Wales offers strong policy protection for ancient woodland, with paragraph 6.4.43 stating that:

'*Ancient woodland, semi-natural woodlands, individual ancient, veteran and heritage trees and ancient hedgerows are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees, woodlands and hedgerows are to be afforded protection from development which would result in their loss or deterioration unless very exceptionally there are significant and clearly defined public benefits; this protection must prevent potentially damaging operations and their unnecessary loss. In the case of a site recorded on the Ancient Woodland Inventory, authorities should consider the advice of NRW. Planning authorities should also have regard to the Ancient Tree Inventory, work to improve its completeness and use it to ensure the protection of trees and woodland and identify opportunities for more planting as part of the Green Infrastructure Assessment, particularly in terms of canopy cover.*'

5.4 In accordance with PPW, any loss or damage to ancient woodland should be avoided wherever possible, with any unavoidable loss appropriately compensated for. Any developments that would result in significant adverse impacts to ancient woodland are likely to be refused. It is therefore recommended that the woodland boundary is retained in full with an appropriate ecotone buffer as part of the local Green Infrastructure (GI) network. Furthermore, any proposed layout should also consider installing fencing along the boundary of the ecotone buffer or otherwise creating a dedicated pedestrian route so as to further protect the woodland from e.g. trampling and subsequent degradation of the ground flora from increased numbers of residents/dog walkers etc. The measures mentioned above would also be appropriate to limit potential impacts to the SINC designation.

Badger

5.5 While no setts are located at/adjacent to the site, evidence found during the site visit indicates the site falls within the home range of a local Badger family group. Retention of the boundary woodland and hedgerows with appropriate grassy buffers would limit any potential impacts to Badgers and allow for their continued movement around/across the site. It is also recommended that during the construction phase of any future development, any excavations with steep/near vertical sides are covered overnight, or a means of escape provided (e.g. rough sawn timber board of 300mm width placed at an angle of $\leq 45^{\circ}$) to minimise the risk to Badger and any other small mammals that may become trapped (e.g. Otter or Hedgehog). In the event that construction works do not commence within 12 months of the current report, a repeat walkover survey would be recommended to establish if any new setts have been dug in the local area which would require consideration (i.e. any within a 30m radius of the construction zone) – Badgers and their setts are afforded legal protection under the Protection of Badgers Act (1992).

Bats

5.6 The survey identified three trees within the site boundaries that were considered to hold potential of supporting roosting bats (see Target Notes 4 & 12). Any future development at the candidate site should seek to retain these trees to limit impacts to local bat populations. In the event that felling/pruning works were unavoidable (e.g. for H&S reasons), then in accordance with the current best practice guidelines (BCT, 2023), further survey work would be required. The mature Ash assessed as PRF-M (moderate/high roosting potential) would require a combination of tree-climbing inspection and/or emergency surveys (3no. in total) undertaken between May – August to determine the likely presence/absence of roosting bats. The two Oaks assessed as PRF-I (low roosting potential) would not require any further survey work under the BCT guidelines. However, on a precautionary basis, if either of these were to be removed, then a soft-felling approach would be recommended. These trees should be section felled with cut tree limbs carefully lowered and left grounded overnight to allow

any bats present to leave (Jackson, 2015). All other trees within the site boundaries (not including the boundary woodland) have negligible potential to support bats and therefore have no constraints i.e. no further survey requirements or restrictions to works in relation to bats. Trees found along the woodland edge were not individually assessed during the current survey and so these would also require further scoping works for roosting bats if any were to be impacted – although as mentioned above, these should be retained and protected to limit potential impacts to the ancient woodland/SINC designation.

5.7 Other features at the candidate site such as the hedgerows, wet ditch and woodland edge represent suitable foraging habitat/commuting features for local bats. While no plans were available at the time of writing this report, it is likely that several hedgerows will require breaches to accommodate any future development and associated infrastructure. Given the scale of the candidate site, further activity surveys (manual transects and automated surveys) would be required as part of a planning submission to establish how bats are using the candidate site to inform any particular mitigation/avoidance measures. Based on the availability of suitable habitats at the candidate site, the minimum level of survey recommended in the best practice guidelines (BCT, 2023) would be considered appropriate in the first instance to achieve a representative sample of bat activity across the site. This would comprise 3no. night-time bat walkover (NBW) surveys, with one survey visit conducted in each season (i.e. one in spring – April/May, one in summer – June/July/August, and one in autumn – September/October). Given the size of the candidate site, NBWs are likely to consist of more than one transect route. Separate automated/static surveys (minimum one static per transect route) would also be required, with each session recording for 5 consecutive nights *in situ* per season. The location of the static detectors (e.g. Anabat Express or Swift units) would be focused on the areas likely to be subject to development impacts (e.g. possible locations of hedgerow breaches).

5.8 The design of any site lighting should also seek to reduce artificial light spill onto retained boundary habitats and linear features, partially along the woodland edge and vegetated wet ditch. These habitat features should be maintained as dark corridors for bats and other nocturnal wildlife. See lighting guidance note produced by BCT & ILP (2018) for advice on how to mitigate for impacts of artificial lighting on bats (Appendix V). Any future development should also include specific mitigation/enhancement measures for bats which could include new ecotone/mosaic habitat creation to compensate for any loss of foraging resources, as well as the provision of bat boxes on new buildings and/or retained trees.

Hazel Dormice

5.9 The desk study revealed that a single dormouse nest has previously been found within the candidate site boundaries. The candidate site is also located within the known range of the species (Bright et al., 2006). Hazel Dormouse and their breeding and resting places are afforded legal protection under the Conservation of

Species and Habitats Regulations (2017) and Wildlife and Countryside Act (1981) (as amended). Dependant on the likely impacts of any future development layout at the site, further survey work may be required to determine the likely presence/absence of this species and to inform any appropriate mitigation/avoidance measures or licencing requirements – retention of the woodland edge, scrub and boundary hedgerows would minimise any potential impacts to this species. Dependant on the final development impacts/layout, further consultation with the local authority ecologist would be recommended as part of the planning submission to identify the requirement and scope for further surveys.

5.10 If required, further surveys would involve the deployment of nest tubes and/or footprint tunnels within any suitable habitats (i.e. within scrub and along the hedgerows and woodland margins). As per the current best practice guidelines (Wells et al., 2025), nest tubes/footprint tunnels should be deployed in March/April and checked at monthly intervals for the presence of Dormouse up until November (or until presence was confirmed). A minimum of 50no. nest tubes/tunnels is required to sample a site however, given the scale of the candidate site it is likely that more than 50no. tubes/tunnels will be required to achieve full coverage and demonstrate an appropriate survey effort.

Nesting Birds

5.11 The hedgerows, trees, boundary woodland and scrub were all considered likely to support a variety of tree/shrub nesting bird species, with the open arable and improved grassland areas also providing suitable conditions for ground nesting species, with Skylark observed at the site. Under the Wildlife and Countryside Act (1981) (as amended) all wild birds and their nests are protected against damage or destruction whilst in use or being built. Given the high likelihood of nesting birds being present within habitats at the candidate site, any future vegetation clearance/removal (including both woody vegetation and grassland) should be undertaken outside of the nesting bird season (between September – February). If this is not possible an ecologist should be present to inspect habitats for the presence of nesting birds prior to removal and to supervise vegetation clearance where required.

5.12 Furthermore, any future development should seek to provide specific mitigation and enhancement measures for birds. Appropriate mitigation for the loss of ground-nesting habitat (open arable field and improved grassland) should be considered at the design stage. This could include retaining one (or a section of one) field parcel as a 'ecology mitigation zone', with this area managed appropriately to provide 'skylark plots' within the field. This area could also be used to provide any other required mitigation planting (e.g. scrub, hedgerow, trees, wildflower meadow etc) and would benefit a wide array of fauna. If this was not possible, then appropriate management of an off-site land parcel in the local area would likely be required. The provision of bird boxes on new buildings and/or retained trees should also be considered.

Common Herpetofauna (Reptiles & Amphibians)

5.13 The field margins were considered suitable of supporting small numbers of common reptiles and amphibians, with Slow Worm and Common Frog previously recorded within the candidate site boundaries. All UK reptiles are protected against intentional killing and injuring under Schedule 5 of the Wildlife & Countryside Act (1981) (as amended) and are an important ecological consideration in terms of site development. Retention and protection of the hedgerows and boundary woodland with adjoining grassy buffers would minimise any potential impacts to common herpetofauna and would provide ample foraging/basking/sheltering opportunities to continue to support any small populations that may be present. A targeted reptile survey is therefore not deemed necessary. However, on a precautionary basis, it is recommended that a sensitive approach is taken to any future clearance of hedgerows/scrub/fringe vegetation to minimise any risks to any reptiles/amphibians that may be present. Such vegetation clearance should be undertaken via a two-stage process where an initial cut to 100- 150mm is undertaken with the use of hand tools (strimmers/brush-cutters), followed by a second cut to ground level after a minimum period of 48hrs. Arisings should be removed immediately following each cut.

Priority Habitats

5.14 As discussed in section 5.1, hedgerows & lowland deciduous woodland are listed as Priority Habitats under Section 7 of the Environmental Act (Wales) 2016 and as such should be retained and protected wherever possible and incorporated as part of a strategic green infrastructure (GI) network. In accordance with PPW Chapter 6 and the current LDP, any loss of these features would require appropriate mitigation or compensatory measures which could include new hedgerow and woodland planting/provision. Any defunct/gappy hedgerow sections should be 'infilled' with new native tree/shrub planting to strengthen these features as wildlife corridors.

Otter

5.15 Otters are known to inhabit the nearby Nant Talwg watercourse, and evidence of this species (a footprint) was found within a wet ditch within the site boundaries during the current survey. The presence of Otter in the local area is not considered to represent a major constraint to any future development at the site, with the majority of the site considered unsuitable for use by this species and the wet ditch likely to be used on an irregular basis at most. The retention of this wet ditch with an appropriate buffer of marginal vegetation, along with the boundary woodland to east/southeast, would limit any potential impacts to Otter. However, any works to/adjacent to this wet ditch do have some potential to cause disturbance to Otter. In order to minimise any potential impacts to this species, any works in close proximity to this ditch (e.g. vegetation clearance and/or construction works) should be subject to strict timings to avoid times when Otters are typically active (i.e. dawn and dusk). Any lighting required near the ditch (if retained) as part of the construction process or during the

operational phase of the development, should be turned off outside of working hours so as to maintain the watercourse and adjacent riparian zone as a dark corridor for Otter and other nocturnal wildlife. In the event that an Otter or a feature indicative of an Otter holt/couch/resting place is found at the site (e.g. during vegetation clearance works), all works should stop immediately, and the project ecologist/National Resources Wales (NRW) contacted for advice on how to proceed.

Other Consideration and Enhancements

5.16 Wall Cotoneaster is present in several places along the north-east boundary of the candidate site. This species is listed under Schedule 9 of the Wildlife and Countryside Act (1981) (as amended) meaning it is an offence to plant or cause the spread of it in the wild. Development should seek to control the spread of invasive species and if found elsewhere across the site, should be disposed of appropriately.

5.17 No direct impacts to the Nant Talwg, which forms part of the local North East of Knock Man Down Wood SINC and where Otter have previously been recorded, will occur as a result of any future development at the candidate site. However, there is a small risk of indirect impacts on water quality should a polluting substance be allowed to enter the wet ditch found in the centre of the site during the construction/operational phases of any future development – a review of OS mapping revealed that the wet ditch running through the site may outfall directly into the Nant Talwg. It is recommended that appropriate controls are put in place to minimise any pollution risk during construction and that drainage design incorporates oil/ petrol interceptors as appropriate so as to maintain (or improve) existing water quality within the ditch.

5.18 Hedgehogs and other small mammals are likely to use the habitats present at the site and so any future layout design should incorporate gaps of 130mm x 130mmm at the bottom of garden and boundary fencing to ensure continued connectivity as part of the development[5]. Other possible mitigation and enhancement measures could include the provision of hibernacula or brash/log piles within retained parcels of scrub/woodland parcels and/or along retained vegetated boundaries to provide sheltering opportunities for common herpetofauna, inverts etc. The use of native species in any landscaping plans and the positive management of retained and newly created habitats in order to encourage botanical diversity would help provide a net benefit for biodiversity at the site and would also contribute to the B-lines initiative. Any required SuDS features should be designed in a way so as to benefit biodiversity (e.g. attenuation features designed to hold water during most parts of the year).

[5] Based on the 'Hedgehog Street' principle advised by the People's Trust for Endangered Species (PTES) and other conservation groups: https://www.hedgehogstreet.org/

Avoidance, Mitigation and Enhancements

5.19 The avoidance, mitigation and enhancements described in the sections above are summarised below:

Avoidance

- Retention and protection of woodland boundary (designated as a ASNW & SINC) with an appropriate ecotone buffer.
- Retention and protection of the priority listed habitats (hedgerows and lowland woodland) as far as reasonably practicable.
- Retention of any trees considered suitable for use by roosting bats.
- Retention of the wet ditch with appropriate buffer of marginal/scrub vegetation to limit potential impacts to Otter and other nocturnal wildlife.
- Vegetation clearance (hedgerow/tree/scrub/grass) to avoid nesting bird season and be undertaken over the winter period (between September – February).

Mitigation

- Design of site lighting to minimise artificial light spill onto boundary features to limit impacts to foraging/commuting bats and other nocturnal wildlife. Any increase in lux level to be less than or equal to 0.5 lux.
- Retention of area of land (e.g. one field parcel) as an 'ecology mitigation zone' with this area managed appropriately to mitigate the loss of ground-nesting habitat, hedgerows, scrub etc.
- Covering of any excavations overnight or means of escape provided during construction phase to minimise risks to Badger and any other small mammals that may become trapped.
- Layout design to feature Hedgehog corridors, to allow for continued habitat connectivity throughout the final development.
- Sensitive clearance of vegetation to safeguard for nesting birds and common herpetofauna.
- Further survey work for bats and Hazel Dormice to inform licensing/mitigation requirements.
- Appropriate controls put in place to safeguard Otter (e.g. strict timings implemented for vegetation clearance/construction work near the wet ditch).
- Implementation of appropriate pollution control measures to maintain (or improve) water quality within wet ditch in order to minimise any potential impacts to the nearby Nant Talwg watercourse.

Enhancement

- Control/eradication of Wall Cotoneaster from the site.
- Inclusion of bat and bird boxes onto new buildings/retained trees.

- Creation (or retention/management) of species-rich grassland in landscaped areas of the site – to be managed to promote botanical diversity (e.g. cut once or twice a year with arisings removed);
- Provision of new native tree/shrub planting to provide additional habitat resources for a wide variety of wildlife;
- Design of any SuDS features to benefit local biodiversity.
- Strengthening of existing hedgerows with new native tree/shrub planting.
- Creation of reptile and amphibian hibernacula within retained scrub/woodland parcels or along field margins.
- Implement Management Plan for retained and proposed planting to maintain & enhance value to Biodiversity.

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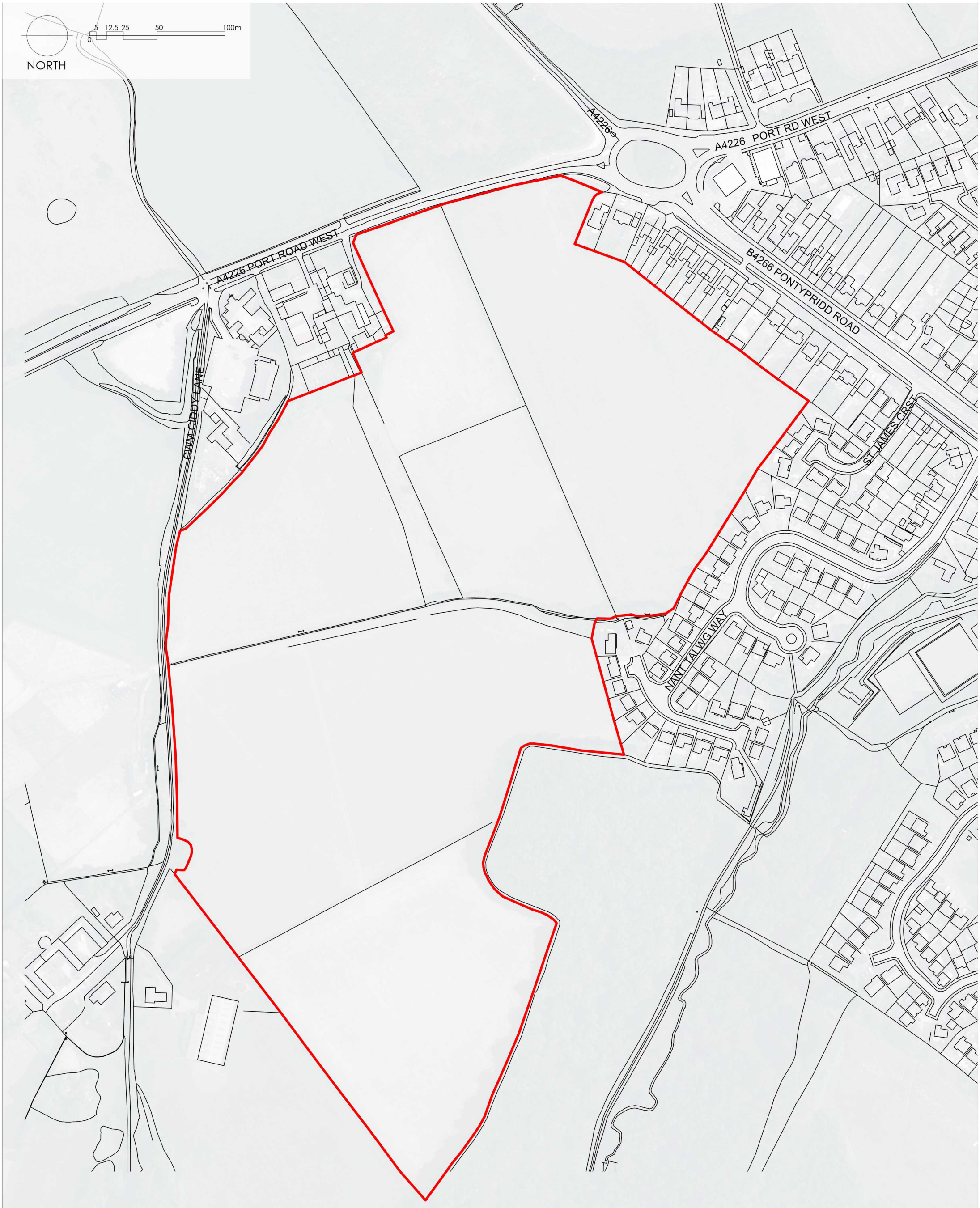
APPENDIX I SITE LOCATION PLAN



Amendments By Chk'd Date

DRAFT FOR COMMENT

Job No/Drawing No	Job Title
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Scale 1:2500 @ A3 / Date 04/25 / Drawn MD / Chk'd JE	Drawing Title: Site Location Plan
All Dimensions to be checked on site	OS Licence No:

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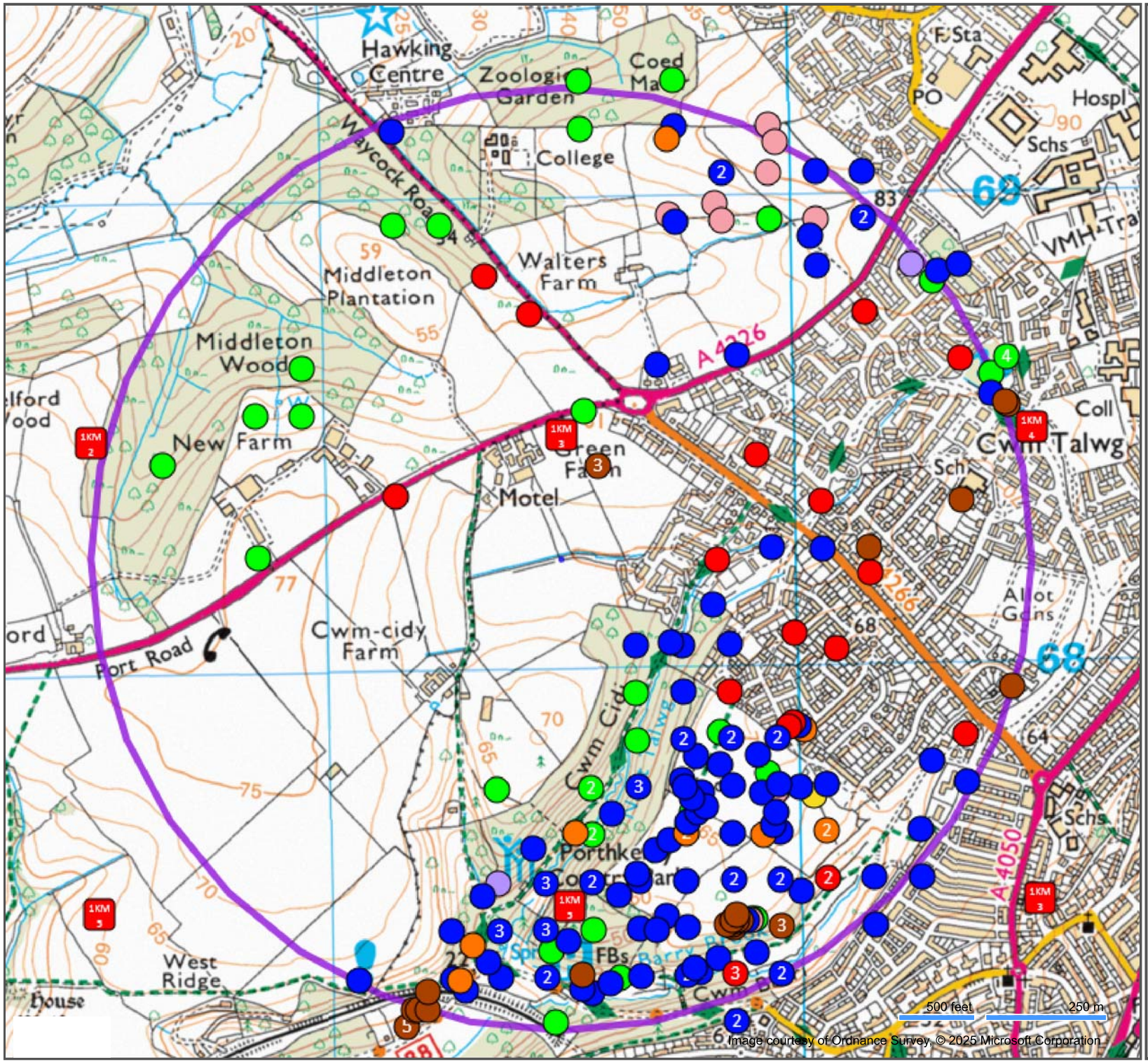
APPENDIX II DESK STUDY INFORMATION RECEIVED FROM SEWBReC



Aderyn
LERC Wales' Biodiversity & Reporting Database

LOCAL ENVIRONMENTAL RECORDS CENTRES WALES
CANOLFANNAU COFNODION AMGYLCHEDDOL LLEOL CYMRU

eMapper for LERC Wales Aderyn Commercial

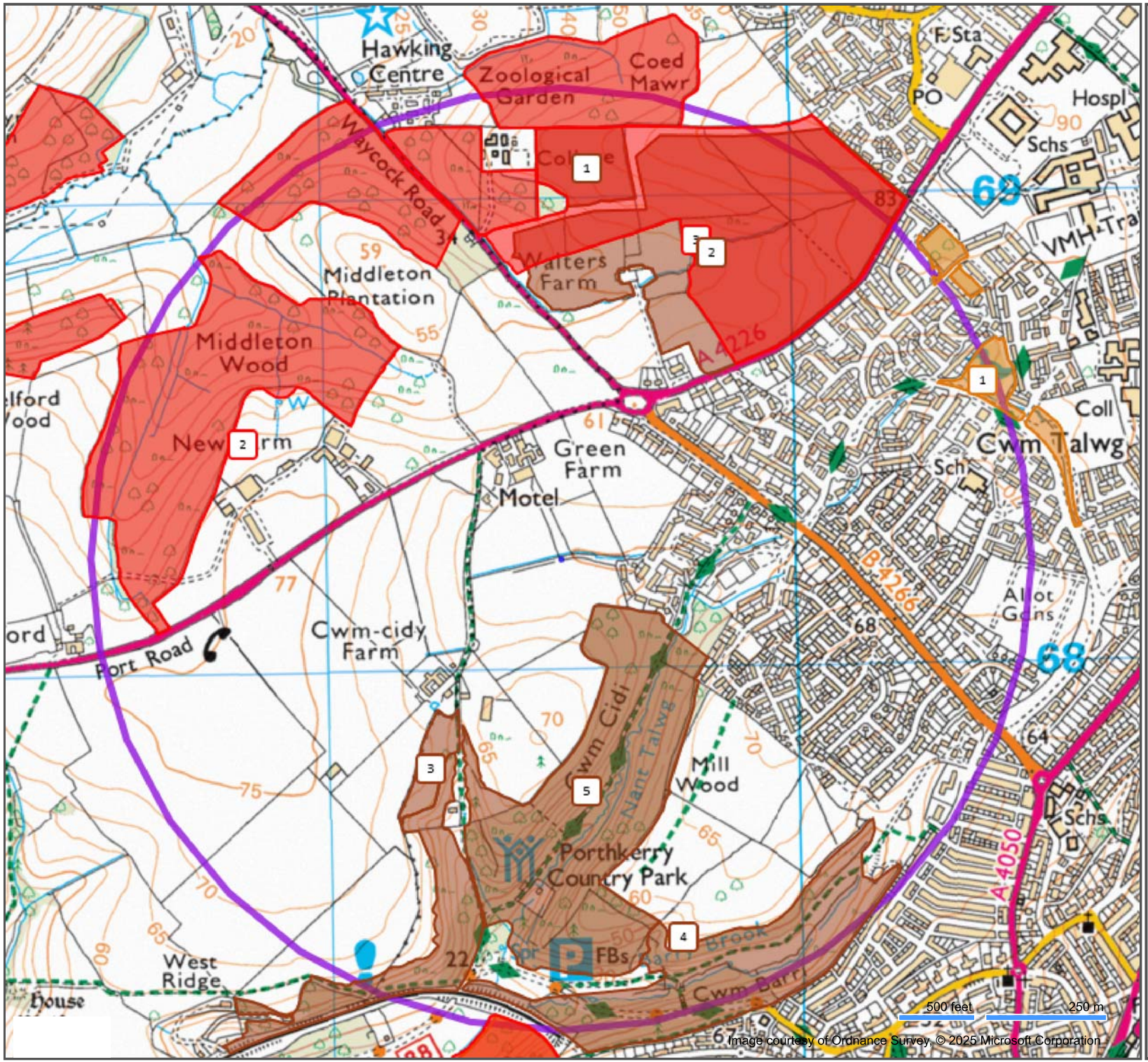
ben-satherley_09/04/2025_land-south-of-weycock-cross-barry / 9310/0256-015

Land at Weycock Cross - Species Map (Public Use)

Key

- Search Location
- Search Buffer (1000m)

- **Bees, Wasps, Ants and Sawflies**
- **Birds**
- **Butterflies and Moths**
- **Fish**
- **Fungi, Lichen and Slime Moulds**
- **Mammals**
- **Other Invertebrates**
- **Plants**
- **Reptiles and Amphibians**



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eMapper for LERC Wales Aderyn Commercial

ben-satherley_09/04/2025_land-south-of-weycock-cross-barry / 9310/0256-015

Land at Weycock Cross - Protected Sites Map (Public Use)

Key

- Search Location
- Search Buffer (1000m)

Local Nature Reserves

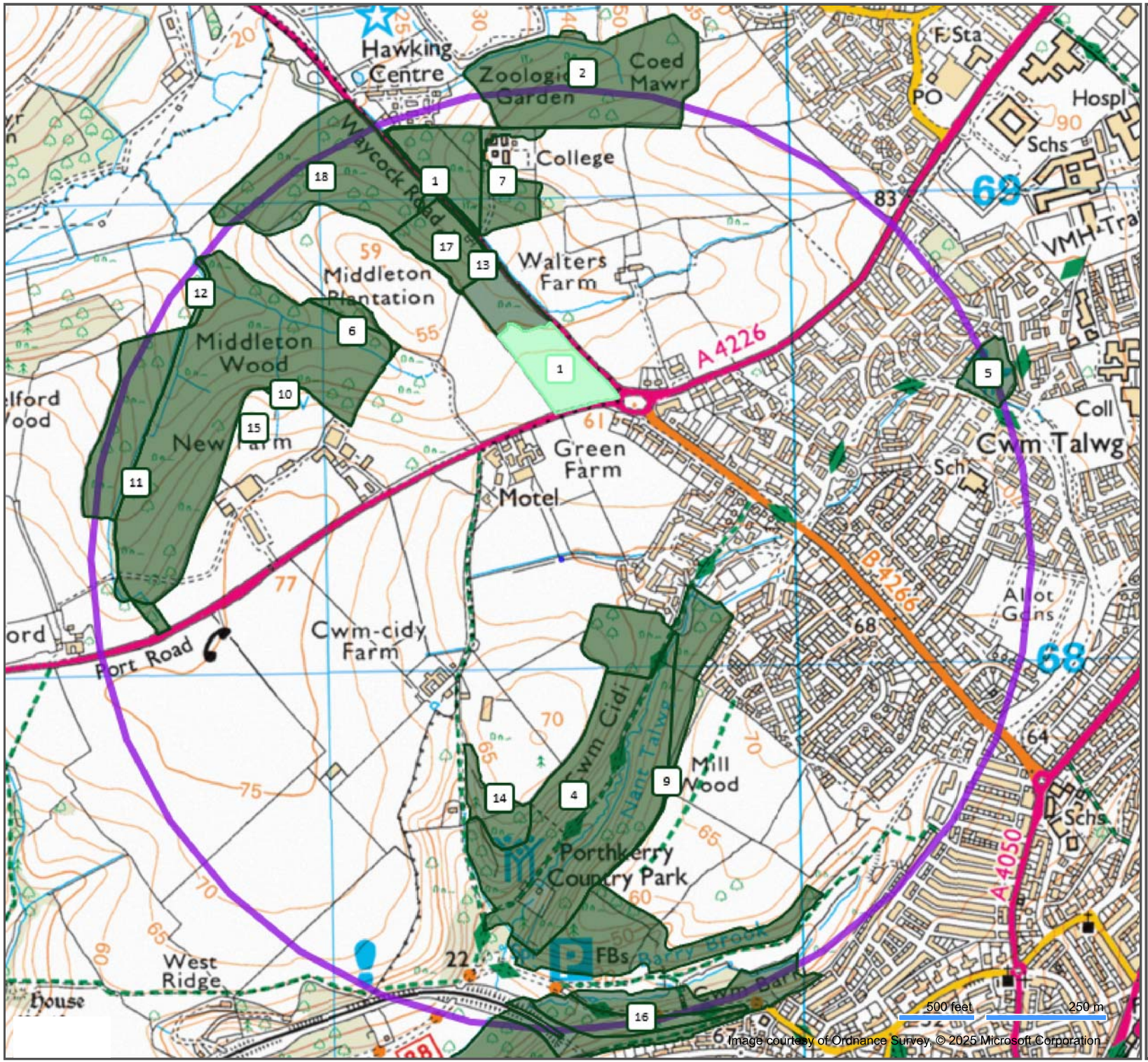
- **1**: CWM TALWG WOODLANDS
- **2**: CLIFF WOOD - GOLDEN STAIRS

Adopted SINC

- **1**: West of Barry College
- **2**: Walters Farm
- **3**: South of Cwm Ciddy Farm
- **4**: North Cwm Barri
- **5**: North East of Knock Man Down Wood

Sites of Special Scientific Interest

- **1**: Cliff Wood - Golden Stairs
- **2**: Coedydd y Barri / Barry Woodlands
- **3**: Fferm Walters



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LOCAL ENVIRONMENTAL RECORDS CENTRES WALES
CANOLFANNAU COFNODION AMGYLCHEDDOL LLEOL CYMRU

eMapper for LERC Wales Aderyn Commercial

ben-satherley_09/04/2025_land-south-of-weycock-cross-barry / 9310/0256-015

Land at Weycock Cross - Ancient Woodland Map (Public Use)

Key

- Search Location
- Search Buffer (1000m)

Ancient Semi-natural Woodland

- **1**: Ancient Semi Natural Woodland
- **2**: Ancient Semi Natural Woodland
- **3**: Ancient Semi Natural Woodland
- **4**: Ancient Semi Natural Woodland
- **5**: Ancient Semi Natural Woodland
- **6**: Ancient Semi Natural Woodland
- **7**: Ancient Semi Natural Woodland
- **8**: Ancient Semi Natural Woodland
- **9**: Ancient Semi Natural Woodland
- **10**: Restored Ancient Woodland Site
- **11**: Restored Ancient Woodland Site
- **12**: Restored Ancient Woodland Site
- **13**: Restored Ancient Woodland Site
- **14**: Restored Ancient Woodland Site
- **15**: Restored Ancient Woodland Site
- **16**: Restored Ancient Woodland Site
- **17**: Restored Ancient Woodland Site
- **18**: Restored Ancient Woodland Site

Ancient Woodland Site of Unknown Category

- **1**: Ancient Woodland Site of Unknown Category

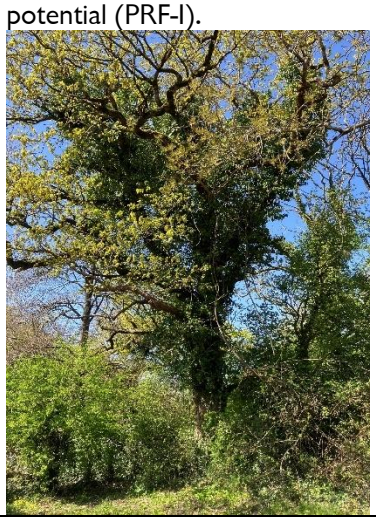
APPENDIX III 2025 EXTENDED PHASE 1 HABITAT SURVEY PLAN & TARGET NOTES

Target Note	Description/Comment
***Birds seen/heard**: Jackdaw, Collared Dove, Wood Pigeon, House Sparrow, Carrion Crow, Robin, Goldfinch, Magpie, Wren, Blue Tit, Blackbird, Blackcap, Nuthatch, Chiffchaff, Song Thrush and Skylark.* ***Other:** Orange-tip, Small White & Speckled Wood butterflies.*	
1	Wall cotoneaster is present along a garden boundary in the northern extent of the site.
2	Arable field margin approx. 2m wide adjacent to garden boundaries. Poor semi-improved grassland with lots of ornamental species/garden escapees such as Daffodil, Spanish Bluebell, Wood Forget-me-not, Hyacinth sp. and Rose sp. The site boundary is defined by a mixture of garden fences, walls and ornamental hedgerows. 
3	Entire boundary in this section of the site is again defined by garden fences/walls. There are a number of semi-mature ornamental and orchard trees sited within the gardens, some of which overhang into the site – all considered to hold Negligible roosting potential. 
4	Small drainage ditch on eastern site boundary. The water in this ditch flows out of the site through a culvert on the eastern boundary, where is presumably links to the nearby Nant Talwg watercourse. This ditch was almost dry at the time of the survey (after a prolonged period of warm/dry weather) and in this location had a stony substrate with bare muddy banks. Two large mature trees can be found on the banks of this ditch. The easternmost of these (a mature Oak) has some standing deadwood and areas of lifted bark. This tree was considered to hold Low roosting potential (PRF-I).

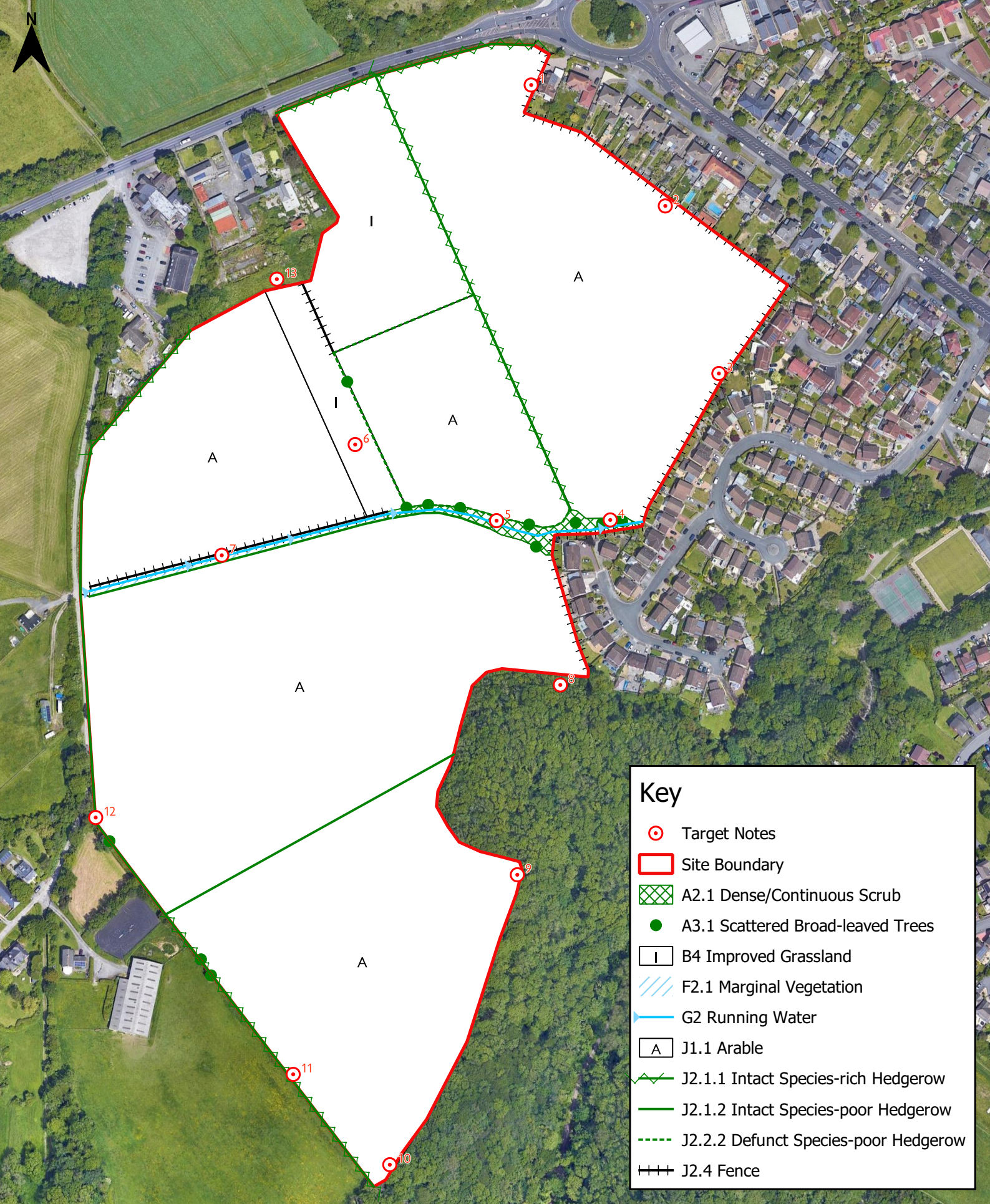
	 The western tree (a mature Ash) is in poor condition with several woodpecker holes which may lead to hidden cavities within the trunk/limbs. Tree contains several other potential roosting features including areas of standing dead wood and vertical splits – High roosting potential (PRF-M). 
5	The wet ditch extends westwards across the site. This section is not overlooked by nearby residential housing and is heavily shaded from the adjacent marginal/scrub vegetation which comprises of Ash, Bramble, Hawthorn, Elder, Rose sp. and Laurel sp. A small number of young Ash and Hawthorn – all negligible roosting potential. Several well-used mammal pathways run alongside and through this vegetated ditch. The lower banks of the ditch are muddy, with the upper banks supporting Common Nettle, Lesser Celandine, Stinking Iris, Lord's-and-ladies, Ivy, Hart's-tongue Fern, Cleavers, Herb Robert, Male Fern, Bracken, Redcurrant, Pendulous Sedge, Hogweed and Hemlock Water-dropwort. A single print indicative of Otter was found on the banks along this section of the watercourse.

	
6	Wide arable field margin (>10m wide) of improved grassland. Mostly Rye-grasses with herbaceous species limited stress tolerant species such as Broadleaved Dock, Common Dandelion, Creeping Buttercup, Common Daisy and White Clover. 
7	Further to the west the wet ditch is more open and is set in a deeper (approx. 2m) channel with steep and densely vegetated banks. Marginal vegetation includes Hemlock Water-dropwort, Hogweed, Common Nettle and Lesser Water-parsnip. The northern bank of the ditch in this area is marked by a post and wire fence with sprawling Bramble, with the southern bank lined by a species-poor hedgerow. 
8	There have been some recent clearance works in this section of the boundary woodland.

	
9	Well-used mammal pathway leading under boundary fence into adjacent woodland. Badger guard hairs found caught in fence. No obvious setts found along woodland boundary or within a 30m radius extending into the woodland. 
10	Another well-used mammal pathway leading under boundary fence and into adjacent woodland. No Badger guard hairs on fence although a latrine was found within the field margin next to this pathway. This contained at least 4no. separate dung-pits, all of which contained fresh faeces.  

	
11	A well-used mammal pathway leads along this field boundary and runs under a boundary fence and under an internal hedgerow. 
12	Semi-mature Oak found in hedgerow marking site's western boundary. Tree is covered in a dense layer of Ivy which may have concealed other potential roosting features – Low roosting potential (PRF-I). 
13	A parcel of dense scrub (Bramble thicket) borders to the northwest.



Key

- Target Notes
- Site Boundary
- A2.1 Dense/Continuous Scrub
- A3.1 Scattered Broad-leaved Trees
- B4 Improved Grassland
- F2.1 Marginal Vegetation
- G2 Running Water
- J1.1 Arable
- J2.1.1 Intact Species-rich Hedgerow
- J2.1.2 Intact Species-poor Hedgerow
- J2.2.2 Defunct Species-poor Hedgerow
- J2.4 Fence

PRELIMINARY | PLANNING | DESIGN | TENDER | CONSTRUCTION

Persimmon Homes East Wales

Land at Weycock Cross, Barry

Extended Phase 1 Habitat Plan

E25132401 / DR01 BS MW 14 April 2025

soltysbrewster

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Vale of Glamorgan
CF64 2AA

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APPENDIX IV FIELD & HEDGEROW PLAN

PRELIMINARY	PLANNING	DESIGN	TENDER	CONSTRUCTION

Persimmon Homes East Wales

Land at Weycock Cross, Barry

Field & Hedgerow Plan

E25132401 / DR02 BS MW 17 April 2025

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APPENDIX V` BATS AND ARTIFICIAL LIGHTING IN THE UK GUIDANCE NOTE

The following is an extract from the Bat Conservation Trust and Institution of Lighting Professionals (2023) guidance note on Bats, Lighting and the Mitigation Hierarchy. Section 4 contains advice on how to mitigate for the impacts of artificial lighting on bats. Full citation:

Bat Conservation Trust & Institution of Lighting Professionals (2023) *Bats and Artificial lighting at Night Guidelines. Guidance Note 08/23*. Bat Conservation Trust, London.

4. Bats, lighting and the mitigation hierarchy

Introduction

4.1 This chapter provides a process for considering the impact on bats as part of a proposed lighting scheme or new development incorporating night-time lighting. It contains a toolkit of techniques which can be used on any site, whether a small domestic project or larger mixed-use, commercial or infrastructure development. It also provides best practice advice for the design of a lighting scheme, for both lighting professionals and other users who may be less familiar with the terminology and theory.

4.2 Under the Agent of Change principle within national planning policy, those seeking to introduce a new plan or project are also responsible for the management of its impact. Therefore, it is crucial that the impacts of obtrusive lighting are mitigated or avoided altogether. While this chapter focuses on how potential lighting impacts on bats can be identified, avoided and mitigated, opportunities for ecological betterment beyond maintaining the status quo should be pursued wherever possible. Doing so would not only fulfil our responsibilities under this principle but contribute to Biodiversity Net Gain in line with legislation. [xlix] Further information on Biodiversity Net Gain can be found here: https://cieem.net/i-am/current-projects/biodiversity-net-gain/

4.3 Effective avoidance and mitigation of lighting impacts on bats relies on close collaboration from the outset between multiple disciplines. Depending on the specific challenges this will almost certainly involve ecologists working alongside architects and/or engineers; however, lighting professionals and landscape architects should be approached when recommended by your ecologist. This should be done at as early a stage as possible, in order to ensure the proposed lighting strategy is acceptable to all disciplines, mitigation is effective and is not in breach of legislation. In this way, delays to approval/adoption and unforeseen costs or liability can be avoided.

4.4 The stepwise process and key follow-up actions are outlined in the flowchart overleaf see figure 3 and followed throughout the Chapter. The questions in the flowchart should be asked in good time to allow any necessary bat survey information to be gathered in advance of lighting design, or fixing a scheme design.

4.5 It should be noted that the measures discussed in this document relate only to the specific impacts of lighting upon retained or newly created bat habitat features, on or adjacent to the site. If loss or damage to roosting, foraging or commuting habitat is likely to be caused by other aspects of the development, separate ecological advice will likely be necessary in order to avoid, mitigate or compensate for this legally and/or in line with ecological planning policies.

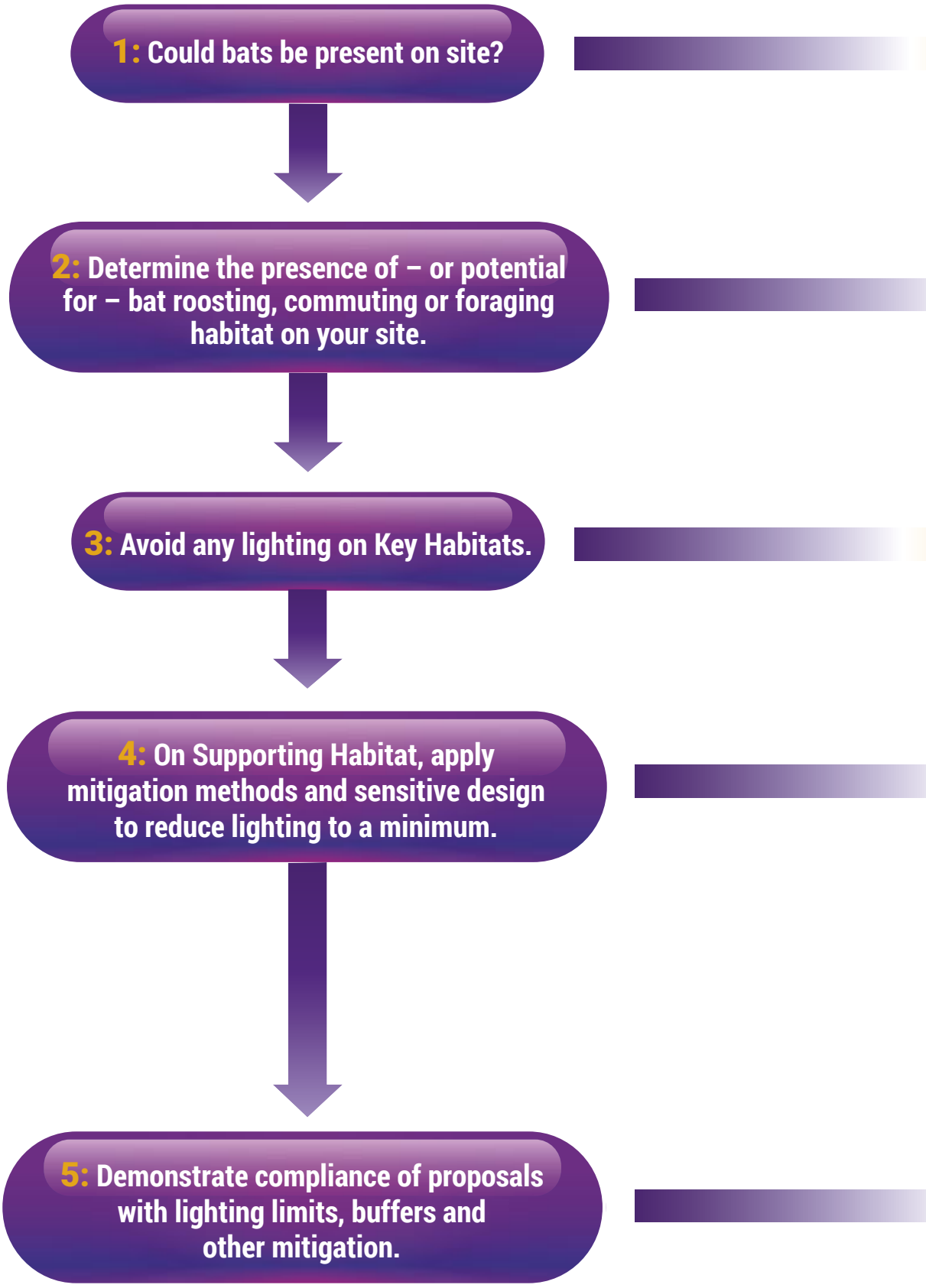
1: Could bats be present on site?
2: Determine the presence of – or potential for – bat roosting, commuting or foraging habitat on your site.
3: Avoid any lighting on Key Habitats.
4: On Supporting Habitat, apply mitigation methods and sensitive design to reduce lighting to a minimum.
5: Demonstrate compliance of proposals with lighting limits, buffers and other mitigation.

Figure 3. Ecology process for lighting.

Step 1: Could bats be present on site?

4.6 If there is no ecological data for your site, an ecologist should be contacted at the earliest opportunity to advise on an initial survey and any potential follow-on surveys. This information should be collected as early as possible in the design process, and certainly before lighting is being specified, so as to avoid the need for costly revisions.

4.7 If any of the following habitats occur on site, and are adjacent to or connected with any of these habitats on or off site, it is possible that proposed lighting may impact local bat populations (please note this list is indicative and advice should be sought from an ecological consultant):

- Woodland, individual mature trees or lines of trees
- Hedgerows and scrub
- Ponds, lakes and other wetland
- Ditches, streams, canals and rivers
- Infrequently managed grassland, or parks, gardens and Public Open Space
- Buildings - Especially, **but not limited to**, those in disrepair or built pre 1970s
- Gravel pits, quarries, cliff faces, caves and rock outcrops
- Any building or habitat known to support protected species
- Any additional scenarios as advised by your Local Planning Authority (LPA)

4.8 If you are unsure about whether bats may be impacted by your project, and an ecologist has not yet been consulted, sources of information on the presence of bats within the vicinity of your site include the following.

- Local Environmental Records Centres (LERC) - Will provide third-party records of protected and notable species for a fee. Search http://www.alerc.org.uk/ for more information
- The Wildlife Assessment Check is a free online tool designed by the Partnership for Biodiversity in Planning to support small-to-medium scale developments by helping identify whether ecological advice should be sought prior to submitting a planning application. The WAC is available online at www.biodiversityinplanning.org/wildlife-assessment-check/
- National Biodiversity Network Atlas - Provides a resource of third-party ecological records searchable online at https://nbnatlas.org - typically this is less complete than LERC data. Please note: Some datasets are only accessible on a non-commercial basis, while most can be used for any purpose, provided the original source is credited
- Local Authority Planning Portal - Most local planning authorities have a searchable online facility detailing recent planning applications. These may have been accompanied by ecological survey reports containing information on bat roosts and habitats

- Defra's MAGIC map - Provides an online searchable GIS database including details of recent European Protected Species licences, and details of any protected sites designated for bat conservation

4.9 The professional directory at the website of the Chartered Institute of Ecology and Environmental Management (www.cieem.net) provides details of ecologists in your area with the relevant skills/experience. The early involvement of a professional ecologist can minimise the likelihood of delays at the planning stage (if applicable) and ensure your project is compliant with conservation and planning legislation and policy.

Step 2: Determine the presence of/potential for bat roosts or habitat and evaluate their importance

4.10 Once a potential risk to bats has been identified, the ecologist will visit the site in order to record the habitats and features present, and evaluate their potential importance to bats. Additionally, they should consider the likelihood that bats could be affected by lighting both on and immediately off site. This survey may also include daytime building and tree inspections, and the deployment of automated bat detectors. On the basis of these inspections, further evening surveys may be recommended, either to determine the presence or likely absence of bats within buildings and/or trees, or to assess the use of the habitats by bats by means of a walked survey. Such surveys may be undertaken at different times during the active season (May - September) and should also involve the use of automated bat detectors left on site for a period of several days. The surveys should be carried out observing the recommendations within the Bat Conservation Trust's Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), and the Interim Guidance Note: Use of Night Vision Aids for Bat Emergence Surveys (BCT, May 2022), or as superseded.

4.11 The resulting report will detail the relative conservation importance of each habitat feature to bats, including the roost-supporting potential of any built structures or trees. The ecologist's evaluation of the individual features will depend on the specific combination of contributing factors about the site, including:

- The conservation status of species likely to be present
- Geographic location
- Type of bat activity likely (breeding, hibernating, night roosting, foraging etc.)
- Habitat quality
- Habitat connectivity off-site
- The presence of nearby bat populations or protected sites for bats (usually identified in a desk study)

4.12 The evaluation will enable the ecologist to determine the presence of any Key Habitats or Supporting Habitats for bats. The whereabouts of these habitats should be set out on a plan of the site or as an Ecological Constraints and Opportunities Plan (ECOP), see Case Study 3. The bat habitat plan/ECOP and report can then be used to help guide the design of the lighting strategy (see next steps) as well as the wider project.

4.13 Key Habitats are those which are considered essential for the function and stability of local bat populations, while Supporting Habitats may be of lesser significance or usage. Habitats falling within neither category are considered to be of negligible or very low importance to bats.

4.14 Examples of Key Habitats include:

- Roosting and swarming sites for all species and their associated flightpaths and commuting habitat
- Foraging or commuting habitat for highly light-averse species (greater and lesser horseshoe bats, some Myotis bats, barbastelle bats and all long-eared bats) or nationally/locally rare species
- Foraging or commuting habitat supporting relatively large numbers of bats or high activity rates as assessed through survey
- Any habitat otherwise assessed by the ecologist as being of elevated importance in maintaining the 'favourable conservation status' of the bat population using it

Step 3: Avoid lighting on any Key Habitats

4.15 An adverse impact from illumination onto a Key Habitat feature is likely to have a significant effect on the bats using it. Therefore, an absence of artificial illumination and glare acting upon both the feature and an appropriately sized buffer zone is most often the only acceptable solution. An ecologist will be best placed to set the size of such a buffer zone according to the species present and the level of usage, and these can be tens of metres if unattenuated light spill or glare from local sources is predicted. The input of a lighting professional should be sought when determining the distances of light spill from new sources and likelihood of glare. It is recommended that proposals are communicated by them to the Principal Designer and the Highways Designer, (if applicable) as in some circumstances these decisions may influence highway function (e.g. visibility departures). Further information on demonstrating an absence of illumination within proposals via lux/illuminance contour plans is provided in Step 5.

4.16 As detailed in Section 2.1, there is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24hr operation, or in high-risk security situations. Nevertheless, these are not exempt from

the statutory protection afforded to bats, their roosts and commuting routes directly associated with roosts, and good design principles recommended under industrial documents such as the Institution of Lighting Professionals' GN01: The Reduction of Obtrusive Light remain best practice. However, in the public realm, while lighting can increase the perception of safety and security, measurable, objective benefits on safety and security are less well established. Consequently, lighting design should be holistic, taking into consideration the relevant British Standards or local policies concerning lighting but, through a risk assessment-style process, be able to fully take into account the presence of protected species and the likely adoption of mitigation approaches through proper engagement with local communities (see Case Study 4).

4.17 Completely avoiding any lighting conflicts in the first place is advantageous, because proposals would be automatically compliant with the relevant wildlife legislation and planning policy, and costly, time-consuming additional surveys, mitigation and post-development monitoring would be avoided. Furthermore, LPAs are likely to favour applications where steps have been taken to avoid such conflicts.

4.18 Sources of lighting which can have the potential to disturb bats are not limited to roadside, footpath or security lighting, but can also include light spill via windows, permanent but sporadically operated lighting such as sports floodlighting, and in some cases car headlights. It is important to note that these situations often comprise many complex variables, and light emission is often difficult to predict or model accurately.

4.19 A competent lighting professional should be involved in the design of proposals as soon as potential impacts (including from glare) are identified by the ecologist, in order to avoid planning difficulties, or late-stage design revision. The lighting professional will be able to make recommendations about placement of luminaires tailored to the project.

Glare

4.20 Glare (extremely high contrast between a source of light and the surrounding darkness - linked to the 'intensity' of a luminaire) may additionally affect bats over a greater distance than the area directly lit by a luminaire. Glare impacts on bats and other wildlife should be considered on the site alongside best practice advice on reducing obtrusive light (see ILP GN01).

Highways

4.21 Where highways lighting schemes are to be designed by the LPA, the ecology officer (or planning officer) should be consulted on the presence of important bat constraints, determined in Step 2, which may impact the design of the lighting scheme in order to ensure compliance with wildlife legislation.

LPA-specific guidance

4.22 Some LPAs have Supplementary Planning Documents (SPD) or other guidance concerning the management of potential development impacts on particular species of bats, or in relation to certain protected sites, such as Special Areas of Conservation (SACs). These should be consulted for particular advice concerning lighting. For example, the North Somerset and Mendip Bats SAC Guidance on Development SPD provides a methodology for calculating the specification of compensatory habitat required to off-set certain development impacts on the bat population of the SAC. In it, retained or created habitats that are subject to lighting above certain lux levels, are considered to be lost to development, with implications for compensation requirements [1].

Environmental Impact Assessment (EIA)

4.23 For plans and projects subject to the Environmental Impact Assessment (EIA) Regulations screening process, it is important for LPAs to understand the nature of mitigation measures at this relatively early stage. Under current EIA Regulations, schemes planning to avoid likely significant effects on the environment through either embedded design measures, such as sensitive site configuration or strategic land/building usage etc., or by other robust mitigation, may be exempt from EIA and therefore less costly. However, the over-reliance on conditions to effect environmental mitigation may be open to legal challenge.

Step 4: On Supporting Habitat, apply mitigation methods and sensitive design to reduce lighting to a minimum

4.24 Supporting Habitats may be less frequently used by bats compared to Key Habitats, or support fewer, or more light-opportunistic species. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved.

4.25 It is important to reiterate the legal protection from disturbance that bats receive under the Wildlife and Countryside Act 1981, as amended. Where the risk of offences originating from lighting is sufficiently high, it may be best to apply the avoidance approach in Step 3. (see Case Study 5).

4.26 Advice from an ecologist and lighting professional will be essential in finding the right approach for the site according to their evaluation. The following are techniques which have been successfully used on projects to limit lighting impacts on bats, and are often used in combination for best results.

[1] https://n-somerset.gov.uk/sites/default/files/2020-03/North%20Somerset%20and%20Mendip%20Bats%20SAC%20guidance%20supplementary%20planning%20document.pdf

Dark buffers and concentric zonation

4.27 A buffer zone subdivided to into smaller zones of increasing illuminance limit further away from the Supporting Habitat would ensure light levels (illuminance - measured in lux) do not exceed certain defined limits. This has the effect of a gradual decrease in lighting from the developed zone, rather than a distinct cut-off, which may provide useable area for the project which also limits lighting impacts on less sensitive species, or less well-used habitat.

4.28 The ecologist (in collaboration with a lighting professional) can help determine the most appropriate buffer widths and illuminance limits according to the value of that habitat to bats. Figure 4 gives an example of a multi-zoned approach which includes Key Habitat (Zone A) which would receive no ALAN, and Supporting Habitat (Zones B and C) which would act as a 'light attenuation zone', but remain within the public realm, and so receive reduced light levels.

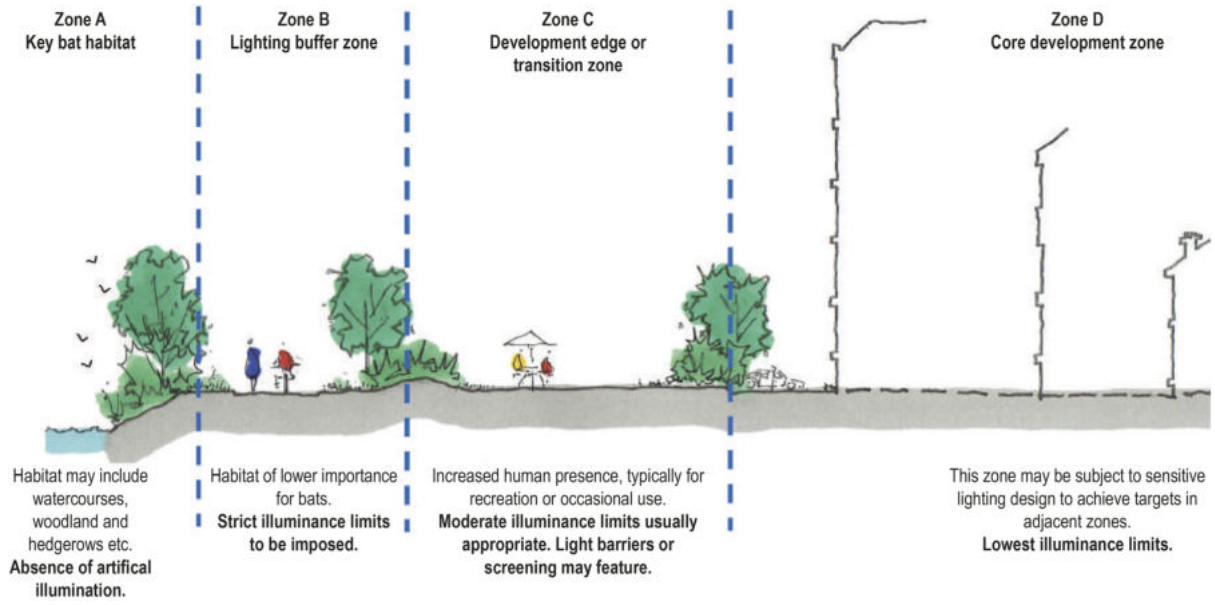

Figure 4. Example of illuminance limit zonation.

Appropriate luminaire specifications

4.29 Light sources, lamps, LEDs and their fittings come in a myriad of different specifications which a lighting professional can help to select. However, the following should be considered when choosing luminaires and their potential impact on Key Habitats and features:

- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability
- A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component

- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012)
- Internal luminaires can be recessed (as opposed to using a pendant fitting - See Figure 5) where installed in proximity to windows to reduce glare and light spill
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges (see Case Study 1)
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt
- Where appropriate, external security lighting should be set on motion-sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate
- Use of a Central Management System (CMS) with additional web-enabled devices to light on demand
- Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues. See Case Study 6
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely

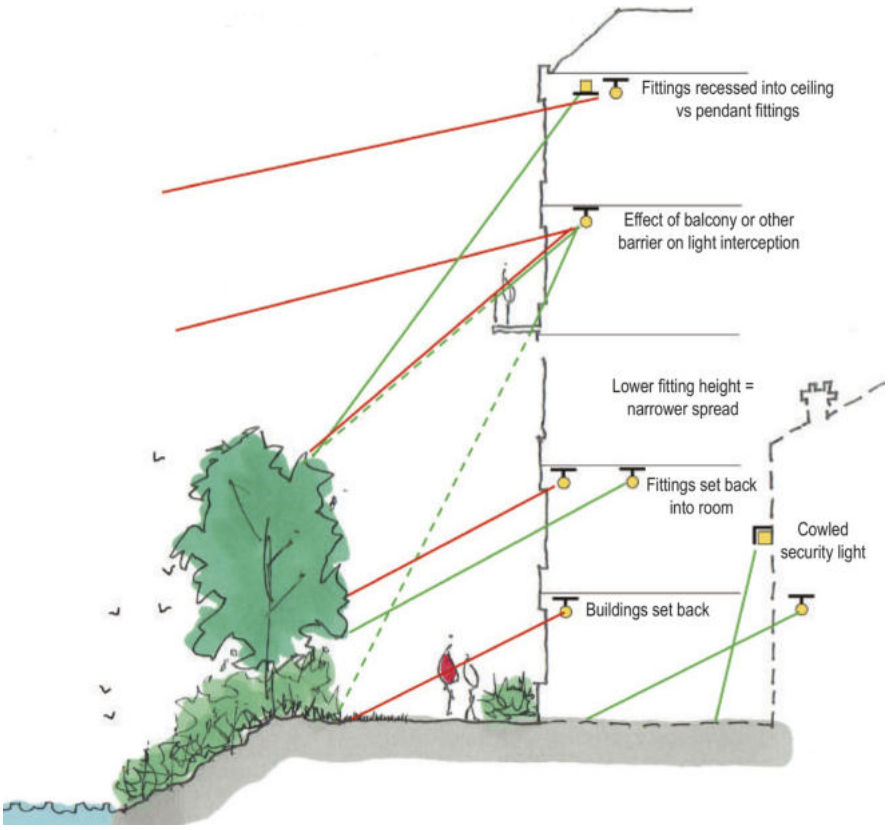

Figure 5. Internal lighting mitigation options.

Sensitive site configuration

4.30 The location, orientation and height of newly built structures, and hard standing, relative to each other can have a considerable impact on light spill. Small changes in terms of the placement of footpaths, open space and windows can all help to achieve a better outcome in terms of minimising light spill onto Key Habitats and features.

- Key or Supporting Habitat is often located alongside, or to the rear of buildings, on new developments. In this case, the removal or reduction of windows can be the most effective way to permanently limit light spill, potentially alongside the internal reconfiguration of the building, to ensure high-use spaces are not as impacted by loss of natural light
- It may be possible to include Key or Supporting Habitat into unlit public open space such as parks. However, avoid including into residential gardens, as uncontrolled and inappropriate lighting may be introduced by residents following occupation
- It is often considered better for a residential scheme to specify good quality downward-directional external light fittings for security, and/or at the front entrance, on short PIR timers, rather than risk the imposition of poor quality and poorly controlled lighting at a later date
- Buildings, walls and hard landscaping may be sited and designed so as to block light spill from reaching habitats and features

- Paved surfaces should not be located within Key Habitat or buffer zones, unless they form part of unlit public open space
- Taller buildings may be best located toward the centre of the site, or sufficiently set back from Key Habitats, to minimise the effect of their light spill
- Column mounted luminaires can be located so that the rear shields are adjacent to habitats, or narrow optics selected that direct light into the task area where needed

Physical screening

4.31 Light spill can be successfully screened through landscaping and the installation of walls and fences, or even banks and bunds (See Figure 6). In order to ensure that fencing makes a long-term contribution, it is recommended that it is supported on concrete or metal posts. Fencing can also be over planted with hedgerow species or climbing plants to soften its appearance and provide a vegetated feature which bats can use for navigation or foraging.

4.32 The planting of substantial landscape features integrated to the wider network of green corridors such as hedgerows, woodland and scrub would make a long-term positive contribution to the overall connectivity of bat habitat and light attenuation. It would also contribute to any local Nature Recovery and Green Infrastructure policies and help achieve obligatory Biodiversity Net Gain targets. A landscape architect can be appointed to collaborate with the ecologist on maximising these natural light screening opportunities.

4.33 It should be noted that newly planted vegetation (trees, shrubs and scrub) is unlikely to adequately contribute to light attenuation upon Key Habitats for a number of years, until it is well established. Sufficient maintenance to achieve this is also likely to be required. Consequently, this approach is best suited to the planting of dense, mature or translocated vegetation. In some cases, it is appropriate to install temporary fencing, or other barrier, to provide the desired physical screening effects until the vegetation is determined to be sufficiently established.

4.34 Given the fact that planting may be removed, die back or inadequately replaced over time, it should never be relied on as the sole means of attenuating light spill.

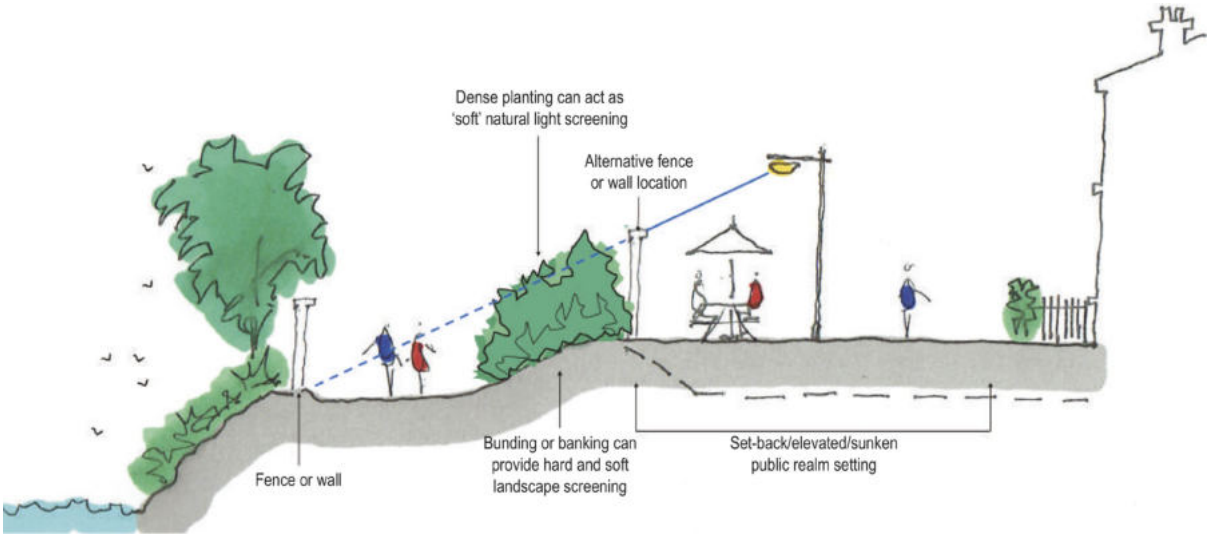

Figure 6. Examples of physical light screening options.

Dimming and part-night lighting

4.35 Depending on the pattern of bat activity across the Supporting Habitat identified by the ecologist, it may be appropriate for an element of on-site lighting to be controlled by dimming or switching either diurnally, seasonally, or according to human activity (light on demand). This is known as Part-Night Lighting (PNL). It is important to state that PNL is not likely to be appropriate where Key Habitats are at risk, especially as PNL often results in lighting when bats are most active.

4.36 A Central Management System (CMS) can be specified by the lighting engineer to dim or turn off individual or groups of luminaires when not in use or during less busy times. Dimming can be precisely controlled, with dimming states often being as low as 10 or 20%. However, due to the electrical difficulties of maintaining a dimming state of under 10%, luminaires should be set to off below this point.

4.37 Lighting could be set to a low output state by default, to turn up to a pre-determined output in response to a trigger, and be combined with a timeclock or photocell to further add an element of seasonal or diurnal control. For example, Passive Infrared (PIR), Artificial Intelligence enabled cameras, on demand controls, or pressure sensors may be used to trigger lights to come on or dim in response to movements, either by vehicles (for example at car parks or industrial loading bays) or by pedestrians (for example a footpath leading from residential development through an area of Supporting Habitat). The timeclock or photocell could ensure that this response only occurs during a set window of hours after sunset and before sunrise, or during certain months.

4.38 Where some trigger is used to temporarily modify lighting states, it will be necessary to specify the timed trigger window during which the response is maintained beyond the last triggering activity. For most typical residential purposes, 1-2 minutes is likely to be sufficient, however risk assessments must

be performed in line with BS5489-1. The proposed system of lighting control will be determined by the outcome of the risk assessment. Where used in locations which receive distinct busy periods, such as cycle paths used by commuters, care will be needed to ensure lighting responds adequately to permit safe usage, but avoids both over-illumination and potentially disruptive dimming states of lighting groups.

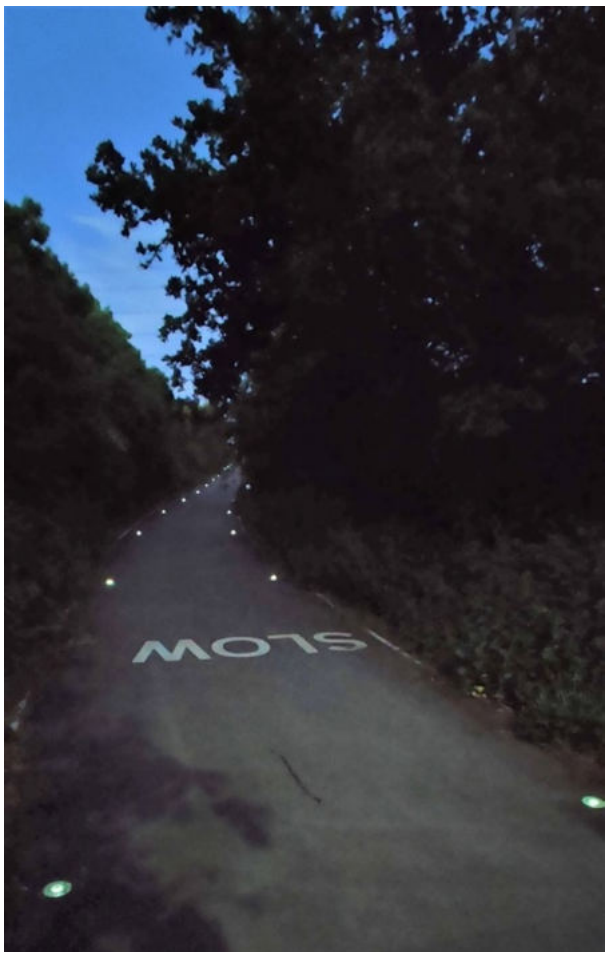

Photo 4: Waymarkers installed on a multi-user path in Worcester. Image credit: Cody Levine.

4.39 Alternative lighting designed for subtle waymarking, rather than illumination, may be more appropriate, such as very low-wattage, ground-level luminaires (photo 4). This lighting option can have a number of additional benefits such as a reduced risk of vandalism, lower carbon footprint during manufacture and fitting and no requirement for cabling. However, it should be noted that these systems depend on regular maintenance and a long-term commitment for them to be successful, as well as a clear view of the sky for solar-powered options. Due to this, proposals and potential planning conditions should be considered in liaison with maintenance teams, to ensure success (and any handover of assets) post install. See Case Study 1 for further information.

4.40 Part-Night Lighting should be designed with input from an ecologist as it may still produce unacceptably high light levels when active or dimmed. Part-Night Lighting is not usually appropriate where lights are undimmed during key bat activity times, as derived from bat survey data or within riparian habitats (see research chapter 1.27). Research has indicated that impacts upon commuting bats are still prevalent where lighting is dimmed during the middle of the night at a time when illumination for humans' use is less necessary (Azam et. al., 2015) thus this approach should not always be seen as a solution, unless backed up by robust ecological survey and assessment of nightly bat activity. In this case, designing areas to be lit to avoid retained Key Habitat, or the provision of sufficient alternative dark corridors, may be the only solution.

Glazing treatments on buildings

4.41 As mentioned, glazing should be restricted and reduced wherever the ecologist and lighting professional determine there to be a likely significant effect upon bats' Key Habitat and associated features.

4.42 Where Supporting Habitat is present, glazing treatments such as tinted, frosted or low transmission glazing treatments are not generally considered suitable ways of fully mitigating light spill. In the case of frosted or 'frit' glazing, windows typically remain luminous surfaces in their own right, defeating the objective of reducing lighting impacts. Although promisingly named, low-transmission glazing (glazing with a lower visible light transmittance) often makes only a very small difference to light spill in practice - a window's fundamental objective is to transmit light!

4.43 Automatic blinds should be discouraged as their longevity depends on regular maintenance and successful routine operation by the occupant. Such blinds are generally only suited to commercial situations where maintenance can be incorporated into the long-term regime routine for the building.

4.44 Depending on the height of the building and windows, and therefore predicted light spill, glazing treatments or window design restrictions may not be required on all storeys. This effect can be more accurately determined by a lighting professional.

Creation of alternative valuable bat habitat on site

4.45 The provision of new, additional or alternative bat flightpaths, commuting or foraging habitat is encouraged and could result in appropriate compensation for any such habitat being lost to the development. The ecologist will be able to suggest and design such alternative habitats, although particular consideration should be given as to its connectivity to other features, the species to be used, the lag time required for a habitat to sufficiently establish and the provision for its ongoing protection and maintenance.

4.46 As almost all new development will be required to result in at least 10% Biodiversity Net Gain (BNG), opportunities to improve habitat connectivity for bats should always be considered. Further to the 10 principles at the core of BNG, the implementation of sensitively sited habitat features for bats would be a clear contribution to 'additionality'. Particularly when considering achieving BNG off-site, assessment should be made of the impacts of altering the type and proportion of bat-suitable habitats, both within and beyond the site, upon the potential Core Sustenance Zone of any maternity roosts which use them.[2]

[2] https://cdn.bats.org.uk/uploads/pdf/Bat-Species-Core-Sustenance-Zones-and-Habitats-for-Biodiversity-Net-Gain.pdf

Step 5: Demonstrate compliance with illuminance (lux) limits and buffers within proposals and, where appropriate, the operational scheme

4.47 Once it has been determined through the above process how Key and Supporting Habitats will be protected, or impacts on them mitigated or compensated for, it will be necessary to demonstrate how this will be achieved. For a planning application, this information is increasingly required prior to determination in order for the LPA to make an informed decision and discharge statutory duties towards protected species legislation and policies. This is most likely to be the case for 'Full' planning applications. For 'Outline', phased or complex applications, this information is, at times, deemed a 'Reserved Matter', for which detail will normally follow at a later date before final consent is granted, or in the discharging of reserved matters. Incidences include EIAs and should be made prior to determination. It is appropriate for a pre-commencement planning condition to be imposed on a consented application which would require that an ecologically sensitive lighting plan is prepared, or is achievable.

4.48 In all cases where impacts from lighting on bats are possible, the LPA will require some form of documentation to be produced by the lighting engineer, either in collaboration with the ecologist, or working to the constraints set out within the bat habitat plan/ECOP (see Step 2), in order to demonstrate compliance. Usually, this will take the form of a 'Lighting Strategy', 'Lighting Design' or 'Lighting Impact Assessment', depending on the level of detail in the application. A Lighting Strategy may simply set out the agreed lighting parameters, objectives and likely mitigation requirements (e.g. unlit zones and any other bat mitigation), together with a plan. A Lighting Design/Impact Assessment would provide finalised details, consisting of a plan to show modelled illuminance from all proposed (and existing, where necessary) light sources, taking into account all site configuration, physical screening and glazing measures adopted. It would usually be accompanied by an explanatory document detailing the specification of each luminaire, as well as all assessment assumptions made and any other rationale for lighting mitigation, such as recessed light fittings or part-night lighting.

4.49 In the case of Outline or phased applications, the precise detail of architectural materials, glazing, landscaping etc. might not be known at the time of submission, therefore a Lighting Strategy may be the most appropriate document to provide. As described above, the bat mitigation objectives derived from the ecologist's bat habitat plan/ECOP should be referenced. It is worth being aware of the potential for matters such as highways (incorporating highways-specific lighting needs) to be fixed at Outline consent stage, which can make the resolution of bat mitigation requirements at a later stage challenging. This highlights the importance of inter-discipline collaboration and early communication of ecological constraints.

4.50 In the case of small or simple planning applications, where significant impacts upon bats from lighting are of a low likelihood, the production of a full Lighting Design package may be disproportionately costly and time-consuming. It may therefore be appropriate to provide a simplified document produced between

the ecologist and lighting engineer, setting out design decisions undertaken and the likely achievability of the recommendations within the ECOP according to the lighting engineer's professional judgment.

Lighting contour plans

4.51 A horizontal illuminance contour plan can be prepared by a suitably experienced and competent lighting professional (Member of the Institution of Lighting Professionals (ILP), Chartered Institution of Building Services Engineers (CIBSE), Society of Light and Lighting (SLL) or similar to ensure competency) using an appropriate software package to model 'Day 1', extent of light spill from the proposed, retained and, possibly, existing luminaires. The various buffer zone widths and illuminance limits which may have been agreed can then be overlaid to determine if any further mitigation is necessary. In some circumstances, a vertical illuminance contour plot may be necessary to demonstrate the light in sensitive areas, such as entrances to roosts or the Key Habitat associated with it (see Appendix).

4.52 Such calculations and documentation would enable the LPA ecologist to fully assess impacts and compliance.

4.53 Because illuminance contour plots and plans may need to be understood and examined by non-lighting professionals, such as architects and local planning authority ecologists, the following should be observed when producing or assessing illuminance contour plans, to ensure the correct information is displayed.

- A calculation showing output of luminaires to be expected at 'Day 1' of operation should be included, where the luminaire and/or scheme Maintenance Factor is set to 1. Schemes using Constant Light Output (CLO) luminaires should also be calculated using 'Day 1' output
- Where deemed necessary by a lighting professional, models should be issued so that all luminaires (i.e. internal and external, or between different phases/plots) can be assessed and each should be set to the maximum output anticipated to be used in normal operation on site (i.e. no dimming where dimming is not anticipated during normal operation)
- Where dimming, PIR, or variable illuminance states are to be used, an individual set of calculation results should accompany each of these states
- A horizontal calculation plane representing levels of illuminance at ground level should always be used
- Vertical calculation planes should be used wherever appropriate, for example along the site-facing aspects of a hedgerow or façade of buildings containing roosts, to show the illumination directly upon the vertical faces of the feature. Vertical planes can also show a cross-sectional view within open space (however, they will only face one direction.) Vertical planes will enable a visualisation of the effects of illumination at the various heights at which different bat species fly. An ecologist can

advise on the most appropriate dimensions to use according to the likely locations of bat flight around the site's habitats

- The contours (and/or coloured numbers) for 0.2, 0.5, 1, 5, and 10 lux must be clearly shown, as well as appropriate contours for values above these
- Each illuminance/lux contour plan should be accompanied by a table showing their minimum and maximum illuminance/lux values
- Where buildings are proposed in proximity to key features or habitats, plots should also model the contribution of light spill through nearby windows, making assumptions as to internal luminaire specification, internal lighting levels, and visible light transmittance of windows. It should be assumed that blinds or curtains are absent or fully open. Assumptions will need to be made as to the internal luminaire specification and levels of illuminance likely to occur on 'Day 1' of operation. These assumptions should be clearly stated and guided by the building/room type and discussions between architect, client and lighting professional. Consideration may also need to given to the site topography, and differences in ground levels between key features and lit areas or buildings. It is acknowledged that in many circumstances, only a 'best effort' can be made in terms of accuracy of these calculations as it is often not possible to account for all 'real world' conditions and variables which influence light. Note that evidence-based professional judgement is needed to assess whether light from windows should undergo a full assessment, dependent on factors such as the distance between light source and critical habitats
- Modelled plots should not include any light attenuation factor from new or existing planting, due to the lag time between planting and establishment and the risk of damage, removal or failure of vegetation. This may result in difficulties in the long-term achievement of the screening effect and hamper any post-construction compliance surveys
- The illuminance contour plots should be accompanied by an explanatory note from the lighting professional to list where, in their opinion, sources of glare acting upon the key habitats and features may occur, and what has been done/can be done to reduce their impacts

4.54 **N.B.** It is acknowledged that, especially for vertical calculation planes, very low levels of light (<0.5 lux) may occur even at considerable distances from the source if there is little intervening attenuation. It is therefore very difficult to demonstrate 'complete darkness' or a 'complete absence of illumination' on vertical planes where some form of lighting is proposed on site, despite efforts to reduce them as far as possible and where horizontal plane illuminance levels are zero. Consequently, where 'complete darkness' on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is at or below 0.2 lux on the horizontal plane, and at or below 0.4 lux on the vertical plane. These figures are still lower than what may be expected on a moonlit night and are in line with research findings for the illuminance found at hedgerows used by lesser horseshoe bats, a species well known for its light averse behaviour. [xvi]

Baseline and post-completion light monitoring surveys

4.55 Baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on Key and Supporting Habitats and features, and so may prevent the agreed or modelled illuminance limits being achieved. This data can then be used to help isolate which luminaires might need to be removed, or where screening should be implemented, or establish a new illuminance limit reduced below existing levels. For example, where baseline surveys establish that on or off-site lighting illuminates potential Key Habitat, improvements could be made by installing a tall perimeter fence adjacent to the habitat, and alterations to the siting and specification of new lighting, to avoid further illumination.

4.56 Baseline lighting surveys must be carried out by a suitably qualified competent person with the correct equipment. As a minimum, readings should be taken at ground level on the horizontal plane (to give illuminance hitting the ground), and in at least one direction on the vertical plane at between either 1.5m or 2m above ground (to replicate the likely location of bats using the feature or site). The orientation should be perpendicular to the dominant light sources, or perpendicular to the surface/edge of the feature in question (such as a wall or hedgerow), in order to produce a 'worst case' reading. Further measurements at other orientations may prove beneficial in capturing influence of all luminaires in proximity to the feature, or principal directions of flight used by bats. This should be discussed with the ecologist.

4.57 Baseline measurements should be taken systematically across the site or features in question, with time, date and time of sunset also recorded. They will need to be repeated at intervals to sample across the site or feature, either in a grid or linear transect, as appropriate. The lighting professional will be able to recommend the most appropriate grid spacing.

4.58 Measurements should always be taken in the absence of moonlight, either on nights of a new moon or heavy cloud, to avoid artificially raising the baseline. As an alternative, moonlight can be measured at a place where no artificial light is likely to affect the reading.

4.59 As all illuminance level contours will be produced from modelled luminaires at 100% output, baseline measurements should, wherever practicable, be taken with all lights on and undimmed, and with blinds or screens over windows removed. Cowls and other fittings on luminaires can remain in place.

4.60 Where possible, measurements should be taken during the spring and summer, when vegetation is mostly in leaf, in order to accurately represent the baseline during the principal active season for bats, and to avoid artificially raising the baseline.

4.61 The topography of the immediate surrounding landscape should be considered in order to determine the potential for increased or decreased light spill beyond the site.

Post-construction/operational phase compliance-checking

4.62 Post-completion lighting surveys are often required where planning permission has been obtained on the condition that the proposed lighting levels are checked to confirm they are in fact achieved on site, and test that the lighting specification (including luminaire heights, design and presence of shielding etc.) is as proposed.

4.63 All lighting surveys should be conducted by a suitably qualified competent person. They should be conducted using the same measurement criteria and lighting states used in the preparation of the illuminance contour plots and/or baseline surveys, as discussed above. It may be necessary to conduct multiple repeats over different illumination states, or other conditions specific to the project.

4.64 Depending on the potential for residual impacts on bats, and the scale of the proposed scheme, it is often appropriate to factor in bat monitoring surveys. These should have the aim of confirming an absence of significant changes in bat presence, species assemblage or behaviour between lit and unlit areas, compared to baseline results. Results should always be reported to the LPA as per any such planning condition. A 'Statement of Conformity' or similar report should be prepared in order to provide an assessment of compliance by the lighting professional, and a discussion of any remedial measures which are likely to be required in order to achieve compliance. Any limitations or notable conditions such as deviation from the desired lighting state, or use of blinds/barriers should be clearly reported. Ongoing monitoring schedules can also be set, especially where compliance is contingent on automated lighting and dimming systems, or on physical screening solutions.

Conclusion

4.65 **In summary,** the importance of integrating avoidance measures (as per the first step of the mitigation hierarchy) into developmental design, cannot be overemphasised. Retaining ecologically functional 'dark corridors' and Key Habitats for bats within schemes (in preference to seeking lighting mitigation strategies), avoids costly and time-consuming additional surveys, mitigation and post-development monitoring. Furthermore, LPAs are likely to favour applications where steps have been taken to avoid such conflicts. This master-planning work needs to be informed by robust ecological survey data and lighting assessments, carried out by the relevant experts at the earliest opportunity in the project. Ultimately, light levels should always be designed to minimise potential environmental impact, and maximise the potential of habitat and species enhancement work, through multidisciplinary working and evidence-based new, or retrofit, scheme design.