



Foxhill Farm, Ecological Impact Assessment

FINAL REPORT

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Signed (Author) 	Signed (QA) 
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Executive Summary

This report presents the findings of an Ecological Impact Assessment of land at Foxhill Farm, Halewood, which was commissioned by PWA Planning to inform development proposals for five residential dwellings.

It is based on information collected from a previous desk study, a UKHab survey, internal and external building inspections and a suite of bat emergence surveys conducted between early August and September 2022. Further to this, updated pond assessment and eDNA surveys for great crested newts (*Triturus cristatus*) were completed in April and May 2023. This report considers relevant legislation and planning guidance; key findings and outline mitigation measures are summarised in Table 1 below.

Table 1: Key findings and recommendations

Key findings	
Designated sites	- European designated sites are considered in this assessment and scoped out. - Cartbridge Lane Wood Site of Biological Interest (SBI) is located 45 m from the proposed development.
Habitats	Habitats including modified grassland, dense scrub, developed land and a mature willow tree. Habitats are generally of value at a site level only, however the larger willow tree has greater biodiversity value due to its size and age.
Fauna	- Unmanaged grassland, scrub, trees and the buildings may be used by nesting birds. - An internal and external building inspection and three dusk bat emergence surveys were carried out during the 2022 survey season, covering all buildings within the site. No bats were recorded emerging from any of the buildings. - Ponds subject to eDNA tested returned negative results for great crested newts. Common amphibians may use terrestrial habitats within the site. - There is potential for badger and small mammals to pass through the site.
Recommendations	
Designated sites	Pollution prevention measures to avoid impacts due to run-off and dust; development of a sensitive lighting scheme; and inclusion of advice within new homeowners Information Pack to fit the collar of pet cats with a bell.
Habitats	Soft landscaping should incorporate native shrub and tree species. If removal of the weeping willow is required, compensation will include tree planting and creation of log and habitat piles.
Fauna	- Precautionary working methods are advised for works affecting B1 (farmhouse) and B4 (bungalow), as both buildings have features suitable for bats. - Compensation for the loss of potential roosting features includes bat boxes. - If site clearance works are commenced during the bird nesting season (March – August inclusive), all areas of scrub, rough grassland, buildings and trees should be checked by a suitability experienced ecologist prior to removal. - Precautionary measures will avoid impacting small mammals and common amphibians.

1. Introduction

- 1.1 Bowland Ecology Ltd was commissioned by PWA Planning to undertake an Ecological Impact Assessment of land at Foxhill Farm, Halewood, Liverpool (central grid reference: SJ 45072 86844). This is in relation to a planning application for the development of five residential dwellings.
- 1.2 The site is located to the north of Halewood, a village situated to the south-east of Liverpool. The development boundary encompasses part of a small farm complex, including an unoccupied farmhouse and adjoining cottage with an unoccupied bungalow located to the south. Habitats surrounding the buildings include species-poor modified grassland, bramble and mixed scrub, hardstanding, and a large mature weeping willow (*Salix babylonica*) tree. The site lies in a semi-rural setting and is surrounded by arable fields, associated hedgerows and a small area of semi-natural broadleaved woodland to the south-east (Cartbridge Lane Wood SBI).
- 1.3 An Ecological Appraisal was initially undertaken at this site by Bowland Ecology in 2017, covering the farm outbuildings only. This was followed by an Ecological Impact Assessment in 2021, based on an extended Phase 1 Habitat survey and bat surveys undertaken during 2020 and 2021.
- 1.4 The current assessment follows the Guidelines for Ecological Impact Assessment (CIEEM 2018) and the Guidelines for Ecological Report Writing (CIEEM 2017) and is in line with the British Standard BS42020:2013 'Biodiversity – Code of practice for planning and development'. It is based on information from a previous desk study, a UKHab survey and a series of updated surveys carried out in 2022 and 2023.
- 1.5 The aim of the assessment is to:
 - 1) identify designated sites and important habitats occurring within the area;
 - 2) identify the presence of and potential for important species, including legally protected species; and
 - 3) assess likely impacts and recommend suitable mitigation measures.
- 1.6 The report includes a description of the methods used, habitats and species identified, and recommendations to protect and enhance biodiversity and address legal requirements.

2. Methodology

Desk Study

- 2.1 The aim of the desk study was to identify the presence of statutory and non-statutory designated wildlife sites, legally protected species, and Habitats and Species of Principal Importance (HPI & SPI) for the conservation of biodiversity (Section 41 NERC Act 2006) within the search area.
- 2.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was reviewed for information on locally, nationally and internationally designated sites of nature conservation importance (statutory sites only) and areas identified as HPI within 1 km of the site boundary.
- 2.3 Local records of protected sites and species within 1 km of the site were obtained from a data search with Merseyside Biobank in 2017. The MAGIC website was also searched for records of nearby granted European Protected Species (EPS) mitigation licences for bats and great crested newts (*Triturus cristatus*).
- 2.4 Ordnance Survey (OS) maps and aerial photographs were reviewed to help identify the presence of water bodies and notable habitats, such as hedgerows and woodland, within 0.25 km of the site, which may provide aquatic or terrestrial habitat for great crested newts.
- 2.5 It is recommended¹ that, for developments resulting in permanent or temporary habitat loss at distances over 0.25 km from the nearest pond, careful consideration should be given as to whether a great crested newt survey is appropriate. Although this species may use suitable terrestrial habitat up to 0.5 km from a breeding pond, in this instance a 0.25 km search radius was considered appropriate due to the small scale of the proposed development and unsuitability of the dominant habitats within the site for great crested newts.

UK Habitat Classification Survey (UKHab)

- 2.6 An assessment was made of all areas of vegetation within the site boundaries, based on the standardised UKHab survey methodology (Butcher *et al.* 2020a). This involved a walkover survey to identify vegetation types, which were then classified against those the types set out in UKHab classification system (Butcher *et al.* 2020b). All habitats within the site boundary were mapped and described.
- 2.7 In addition, evidence of and potential for legally protected and notable species was noted, in particular:
 - Potential roosting sites for bats within trees (identification of suitable cracks and crevices – survey undertaken externally and from ground level only); an assessment of the suitability of bat roosting, foraging and commuting habitat was undertaken based on Collins (2016) (see Appendix A);
 - Habitats utilised by other notable and protected species, including amphibians (particularly great crested newt), badger (*Meles meles*), hedgehog (*Erinaceus europaeus*), invertebrates (e.g. butterflies), nesting birds (including any active or disused bird nests) and reptiles; and
 - The presence of the most common invasive plant species subject to strict legal control including: Japanese knotweed (*Fallopia japonica*), giant knotweed (*F. sachalinensis*), hybrid

¹ see the Natural England 'Method statement template for great crested newt mitigation licence', <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence>

knotweed (*F. x bohemica*), giant hogweed (*Heracleum mantegazzianum*), rhododendron (*Rhododendron ponticum*, *R. ponticum* x *R. maximum* and *R. luteum*), and Himalayan balsam (*Impatiens glandulifera*).

- 2.8 The UKHab survey was carried out by Sarah Birtley MBiolSci (Hons), ACIEEM and Rhiannon Kamink MSc BSc (Hons) on the 22nd of August 2022. The weather was overcast with frequent moderate to heavy showers, with a temperature of approximately 20°C and a light breeze (Beaufort Scale 2-3).

Pond Scoping, HSI Survey and eDNA

- 2.9 An updated pond scoping and Habitat Suitability Index (HSI) survey was completed on the 4th April 2023 by Lucy Pocock MSc, BSc (Hons). The survey determined the presence of waterbodies within 0.25 km of the site and assessed their suitability for great crested newts, in line with (Oldham *et al.* 2000). The weather during the survey was dry with scattered clouds, a slight breeze (Beaufort Scale 1) and an approximate air temperature of 10°C.
- 2.10 The HSI assessment and pond scoping was followed by an environmental DNA (eDNA) (presence/absence) survey for great crested newts. The survey used sampling methods outlined in Biggs *et al.* (2014). Pond water samples were collected by Lucy Pocock MSc, BSc (Hons) and Matt Jones BSc (Hons) on the 3rd May 2020 and sent to SureScreen Scientifics, a Natural England accredited laboratory for eDNA analysis to determine the presence/absence of GCN. The weather during the survey was intermittent sun and a slight breeze (Beaufort Scale: 1), with an approximate temperature of 15°C.

Building Inspection Survey

- 2.11 A daytime inspection of the buildings on site (farmhouse – B1, cottage – B2, partly built barn – B3 and bungalow – B4) was completed on the same day as the UKHab survey by Sarah Birtley (Natural England Bat Licence Number 2016-26712-CLS-CLS) and Rhiannon Kamink. This survey was undertaken in line with the Bat Conservation Trust 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (3rd Edition) (Collins, 2016).
- 2.12 The external inspection involved checking for field signs of bats on external features of the buildings with particular attention being paid to ledges, walls, doors and the surrounding ground. An assessment of the potential of the buildings to support bats was also made during the survey i.e., searching for Potential Roost Features (PRFs), such as gaps along roof verges and under roof tiles. High power torches (Cluson Clu-lite 500,000 candlepower) and close focus binoculars were used to aid the survey.
- 2.13 The internal inspection involved a search of the buildings for field signs such as bats, bat droppings, urine stains, bat feeding remains (moth wings, insect cases), bat staining, a distinctive smell of bats, scratch marks and smoothing of surfaces, which would indicate a roosting site. Ladders, binoculars and high-power torches (Cluson Clu-lite 500,000 candlepower and LED Lenser 7.2) were used to aid the survey.
- 2.14 Natural England's Bat Mitigation Guidelines (2004) states that a significant bat roost can normally be determined on a single visit at any time of the year, provided that the entire structure is accessible and that signs of bats have not been removed by others. Using the information collected during the internal and external assessment, a 'roost potential' score was given to the buildings according to the criteria shown in Appendix A (Collins, 2016).

Bat Emergence Survey

- 2.15 A total of four dusk bat emergence surveys were undertaken at the site between early August and September 2022. The surveys aimed to determine the presence of roosting bats, including the species and roost type, as well as gather information on the general activity levels and flight lines used by foraging and commuting bats.
- 2.16 Buildings assessed as having high suitability for roosting bats (B1 – farmhouse and B4 - bungalow) received three survey visits in total, and low suitability buildings (B2 – cottage and B3 – partly built barn) received one survey visit. The survey methodology followed the guidelines as described in Collins, 2016. Table 2 below outlines the survey dates, timings and weather conditions. Surveyors positioned themselves to get the best coverage of the buildings during the surveys and focused in on those areas with the most potential as roosting habitat (see Appendix C for bat surveyor locations).

Table 2: Bat emergence survey dates, surveyors, timings and weather conditions

Survey date	Surveyors	Survey timings	Building reference	Weather Conditions
03/08/22	DA, AJ, CB, FCD, GM, LB, VS	Start: 20:45 End 22:34 Sunset: 21:04	B1, B4	Start temp: 19°C End temp: 17°C Wind: slight breeze F1 Precipitation: dry Cloud cover: 4/8
22/08/22	SB, RK, CB, CB	Start: 20:09 End 21:54 Sunset: 20:24	B4	Start temp: 18°C End temp: 18°C Wind: still F0 Precipitation: dry Cloud cover: 7/8
25/08/22	DF, VS, JS, LB, CB	Start: 20:00 End 21:49 Sunset: 20:19	B1, B2, B3	Start temp: 12.7°C End temp: 9.1°C Wind: still F0 Precipitation: dry Cloud cover: 0/8
22/09/22	DF, LB, LN, ES, NM, VS	Start: 18:55 End 20:41 Sunset: 19:11	B1, B4	Start temp: 14°C End temp: 12°C Wind: F0 Precipitation: dry Cloud cover: 7/8

- 2.17 Surveyors were as follows: Dave Anderson BSc (Hons), MSc, (Natural England Licence Number 2015-15784-CLS-CLS), Aniela James BSc (Hons undergrad.) (AJ), Chris Burdock (CB), Felicity Cunliffe-Davies BSc (Hons undergrad.) (FCD), Gemma McMullen (GM), Lucy Brookfield (NE Licenced bat surveyor) (LB), Vincent Smith BSc (Hons) (VS), Sarah Birtley MBiolSci (Hons), ACIEEM (Natural England Bat Licence Number 2016-26712-CLS-CLS) (SB), Rhiannon Kamik BSc (Hons) QCIEEM (RK), Curtis Blank BSc (Hons) (CB), David Fisher B.Ed (Hons) (Natural England Licence Number 2015-12106-CLS-CLS) (DF), Jordan Simpson MSc, BSc (Hons) QCIEEM (JS), Liz Neale BSc (Hons) (NE Licenced bat surveyor) (LN), Ester Kitching BSc (Hons undergrad.) (ES) and Nina Morris BSc (Hons) (NM).
- 2.18 Surveys were aided by the use of Batbox Duet, Elekon Batscanner, Pettersson D230, EM Touch, EM Touch Pro, Baton XD and Petterson u256 bat detectors.
- 2.19 Surveys also included the use of thermal imaging and infrared technologies during the third emergence survey. A Sony Ax53 infrared camera (in 'night shot' mode) was used with two 850nm IR torches for illumination, mounted with a Batbox baton, to record the north-eastern

elevation of B1 on the 22nd September 2022, with footage manually reviewed the next day. Research has indicated that the use of night vision aids (NVA) has the potential to significantly increase the detectability of bats during emergence surveys, meaning dusk surveys may be effective than dawn surveys (Bat Conservation Trust, 2022). As such, statutory bat survey guidelines will see a shift away from the standard use of dawn surveys, in favour of dusk surveys supported by NVAs. Undertaking three dusk emergence surveys, one of which were supplemented by NVAs, is therefore considered to be acceptable at this site.

Limitations

- 2.20 Ecological surveys are also limited by factors that affect the presence of plants and animals, such as the time of year, migration patterns and behaviour. Therefore, the survey of the study area has not produced a complete list of plants and animals.
- 2.21 Desk study data should not be treated as a comprehensive list of species present within a search area. Many species are under-recorded and low numbers of records can indicate a lack of survey effort in some areas, rather than confirm the absence of a species.
- 2.22 The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats. The UKHab checked, in particular, for the presence of Japanese knotweed, giant hogweed, rhododendron and Himalayan balsam. There may be other invasive plant species present on the site which were not recorded, but it is considered that the survey was sufficient to identify any significant constraints posed by invasive plants.
- 2.23 The bat emergence survey of the Bungalow (B4) was constrained by dense scrub along the northern and north-eastern elevations of the building. This limitation is addressed in Section 5 Mitigation and Opportunities.

3. Results

Desk Study

- 3.1 There are no statutory designated sites within 1 km of the site. The closest European statutory designated site is the Mersey Estuary Special Protection Area (SPA) and Ramsar, the closest boundary of which is situated 4.7 km south of the proposed development site. Qualifying features of the SPA include Annex 1 species golden plover (*Pluvialis apricaria*), alongside a range of other passage and wintering ducks and wading birds, and non-breeding assemblage species.
- 3.2 The site lies within a Site of Special Scientific Interest (SSSI) Impact Risk Zone (IRZ) for the Mersey Estuary SSSI, however, the nature of the proposed development does not fall within the categories requiring consideration and the IRZ therefore is not discussed further within this report.
- 3.3 The desk study identified the following ten non-statutory designated wildlife sites within 1 km of the site boundary:

Table 3: Non-statutory designated sites within 1 km

Site Name	Designation	Distance from site boundary	Key features
Cartbridge Lane Wood (Knowsley)	Site of Biological Interest (SBI)	45 m south-east	An area of semi-natural broadleaved woodland.
Netherley Brook (Knowsley)	Local Wildlife Site (LWS)	0.35 km north-east	A brook supporting a range of aquatic, emergent and grassland vegetation, including unbranched bur-reed (<i>Sparganium emersum</i>) and fennel pondweed (<i>Potamogeton pectinatus</i>). Breeding water vole (<i>Arvicola amphibius</i>) have been recorded.
Netherley Woods and Brook (Liverpool)	LWS	0.42 km north	A mosaic of woodland, grassland and running water.
Netherley Brook Tributary (Knowsley)	LWS	0.55 km north-west	A watercourse site with confirmed water vole breeding.
Green's Bridge Plantation (Knowsley)	LWS	0.48 km south-east	A predominantly deciduous woodland with a variety of other habitats including ditches, ponds and acid grasslands.
Lee Park Golf Course Liverpool	LWS	0.65 km north-west	A golf course supporting a mosaic of semi-natural habitats.
Mill Brook, Netherley (Knowsley)	LWS	0.8 km north	A watercourse site with confirmed water vole breeding.

Halewood Triangle (Knowsley)	LWS	0.8 km south-west	A large site supporting broadleaved woodland, wet and dry grasslands, ponds, and ditches. Breeding great crested newts have been recorded.
Brickwall Covert (Knowsley)	LWS	0.85 km north-east	Mature broadleaved and mixed plantation woodland with associated wetland areas.
Dog Clock Brook, Tarbock (Knowsley)	LWS	0.95 km north	An open watercourse providing good water vole habitat; breeding water vole have been recorded.

- 3.4 The desk study also identified the following areas of habitat within 1 km of the site which potentially qualify as HPI:

Table 4: Potential areas of HPI

Description
- One area of traditional orchard located 0.67 km north-east of the site 20 areas of deciduous woodland, the closest of which is located 45 m south-east of the site (Cartbridge Lane Wood SBI)

- 3.5 An inspection of aerial images and Ordnance Survey maps indicates that there are seven ponds within the 1 km search area. One pond is shown to be present within 0.25 km of the site, however further ponds were identified following site surveys.

UKHab Survey

- 3.6 The locations of habitats recorded during the UKHab Survey are mapped in Appendix C. Each habitat type is described below. Species nomenclature follows Stace (2010).

Modified grassland

- 3.7 Modified grassland is present in several areas of the site, including along the eastern and western perimeters, surrounding the bungalow and within the former garden of the farmhouse. The grassland is unmanaged, species-poor (fewer than 9 species per m²) and is typically dominated by ruderal species, including great willowherb (*Epilobium hirsutum*), creeping thistle (*Cirsium arvense*) and common nettle (*Urtica dioica*). Grasses include tall false-oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*), and occasional meadow grasses (*Poa* spp.). Other species with a patchy distribution comprise soft rush (*Juncus effusus*), broadleaved dock (*Rumex obtusifolius*), common ragwort (*Jacobaea vulgaris*) and common hogweed (*Heracleum sphondylium*). Scattered bramble (*Rubus fruticosus*) is also frequent throughout.

Mixed scrub

- 3.8 Mixed dense scrub borders the former garden of the farmhouse (B1) and is encroaching into the grassland to the north of the bungalow (B4). Species comprise abundant bramble, alongside young trees including hawthorn (*Crataegus monogyna*), sycamore (*Acer pseudoplatanus*), plum (*Prunus* sp.), apple (*Malus* sp.), alder (*Alnus glutinosa*), silver birch (*Betula pendula*) and elder (*Sambucus nigra*).

Bramble scrub

- 3.9 Several areas of scrub comprise dense bramble, with few other species. This habitat type surrounds the bungalow and occurs at the margins between mixed scrub and modified grassland.

Broadleaved trees

- 3.10 A large mature weeping willow is located north-west of the bungalow. The tree appears to be in good condition and features light ivy (*Hedra helix*) cladding, the canopy shades an area of grassland dominated by common nettle.

Urban habitats

- 3.11 Alongside buildings (which are described in detail in Appendix D), other urban habitats within the site include a managed garden to the occupied cottage, the partially built barn, hardstanding and gravel.

Species

Bats

- 3.12 The data search returned records of brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*) and noctule (*Nyctalus noctule*) within 1 km of the survey area. The closest record was of a common pipistrelle roost within the survey area from 2007, although no information was provided on which building (or tree) the roost was located in. There are no records on MAGIC of EPS licences for bats within the 1 km search area.
- 3.13 Previous building inspections and bat activity surveys undertaken by Bowland Ecology in 2017, 2020 and 2021 covered B1, B2 and B3. None of these previous surveys recorded any evidence of bat roosts.
- 3.14 Full building inspection results are presented in Appendix D. In summary, the farmhouse (B1) and the bungalow (B4) offer **high** suitability for roosting bats. Both buildings have been uninhabited for some time and have fallen into a poor state of repair. Potential roosting features (PRFs) for bats include:
- Slipped and missing roof tiles; and
 - Numerous gaps along the roof verge, including apex gaps (on dormer roofs at the bungalow) and degraded soffit boxes/fascia boarding.
- 3.15 The cottage (B2) and partly converted barn (B3) are both assessed as providing **low** suitability for roosting bats as they offer a limited number of PRFs. The cottage was found to have gaps between the soffit box and the roof tiles at the edge of the lean-to extension and main roof adjoining the farmhouse, although the interior of the roof was well-sealed and in good condition. The barn (B3) is an open, unsheltered and exposed structure with gaps in the stone walls and lintels where windows would have been installed.
- 3.16 The updated bat emergence surveys did not record any bats emerging from any of the buildings and overall bat activity recorded during the surveys was low to very low. The species

recorded were limited to pipistrelles, comprising mostly common pipistrelle and occasional soprano pipistrelle (*Pipistrellus pygmaeus*) passes on some of the surveys.

- 3.17 The initial survey of B1 (farmhouse) noted very low bat activity, with few bats observed and most passes noted as faint, distant and not seen, indicating detections from bats using foraging habitats beyond the site or along the periphery of the site. The first bat observed was a common pipistrelle, commuting north-east over the farmhouse at 21:52, 47 minutes after sunset. A further two common pipistrelles were seen commuting over the farmhouse during the survey. On the second survey of B1, the first bat observed was a common pipistrelle at 20:52, 33 minutes after sunset. Activity levels was noted as low, with occasional pipistrelles briefly foraging over the rear garden and commuting around the north-eastern elevation of the farmhouse. The final survey recorded very low activity; a common pipistrelle bat was recorded 25 minutes after sunset, commuting north over the farmhouse, which was followed by occasional foraging activity by common pipistrelles around the adjacent B3.
- 3.18 The surveys of the bungalow also recorded very low bat activity. During the initial survey, the first bat recorded was a common pipistrelle (heard not seen) at 21:30, 25 minutes after sunset. Occasional faint pipistrelle passes were heard by surveyors stationed south and north-west of the building, whilst the surveyor to the north-east noted occasional foraging by common and soprano pipistrelles around the dense mixed scrub and bramble scrub to the north-east of the bungalow. During the final survey, two of four surveyors detected no bat activity, whilst the other two surveyors noted one brief common pipistrelle pass (bat not seen).
- 3.19 Surveyors observed B2 and B3 on the 25th August and recorded occasional pipistrelle activity to the rear of B2, foraging over the garden and along nearby tree line. Pipistrelles were also heard occasional foraging to the north-west of B3.
- 3.20 Despite the low activity recorded within the site, the surrounding habitats, including tree lines, scrub and arable field margins, were considered to provide moderately suitable foraging opportunities for bats in the landscape. Within the site itself, low number of pipistrelles were observed foraging over the garden to the rear of B1 and scrub to the north-east of B4.

Badgers

- 3.21 The data search provided records of badger within 1 km of the survey area, dated 2016. However, no evidence of badger was found during any previous surveys at the site, nor during the updated survey carried out in 2022. Dominant habitats within the site are largely urban and not suitable for badger setts. Considering the lack of badger field signs, flat areas of rank grassland and dense scrub are unlikely to be used for sett-building. However, suitable habitats are present outside of the site, therefore if badgers are present, they may occasionally pass through the site.

Birds

- 3.22 The data search provided records of barn owl (*Tyto alba*), kingfisher (*Alcedo atthis*) and little ringed plover (*Charadrius dubius*) within 1 km of the survey area. During previous surveys of the site, evidence of nesting birds including swallow (*Hirundo rustica*), wren (*Troglodytes troglodytes*), and feral pigeon (*Columba livia*) was associated with the dilapidated farm buildings and the barn (B3) within the current survey area. Barn owl have also been recorded using a box installed within one of the buildings and a tree box (both located outside of the current survey boundary).

- 3.23 Semi-natural habitats present within the survey area include areas of dense scrub, rank unmanaged grassland and the mature weeping willow tree, which all provide opportunities for tree/scrub nesting birds, including species which favour dense vegetation close to the ground. No evidence of bird's nests was recorded during the building inspection, however the buildings do offer nesting opportunities for opportunistic species, such as wren, house sparrow (*Passer domesticus*) and pied wagtail (*Motacilla alba*).
- 3.24 Unlike previous nocturnal surveys undertaken at the site, no barn owl activity was noted, however tawny owls (*Strix aluco*) were heard calling during the third survey. The occupiers also reported to surveyors that a barn owl had recently been sighted using the tree-mounted box located north-west of the farmhouse and cottage.
- 3.25 Within the wider area, arable fields may provide suitable habitat for wintering birds. A request for data from the county bird recorder returned no site specific records of wintering birds. Records from the 2008-2011 atlas surveys of Lancashire and North Merseyside within the wider tetrad (SJ48N) and nearest adjacent tetrad (SJ48M) returned peak counts of two for golden plover and 90 for lapwing (*Vanellus vanellus*). No records of wild swans and pink footed geese (*Anser brachyrhynchus*) were returned. Local up to date records were also searched for wild swans and pink-footed geese, which returned no records.

Other mammals (brown hare, European hedgehog etc)

- 3.26 The surrounding arable landscape may support brown hare (*Lepus europaeus*), however no evidence of the species was identified during the habitat or dusk surveys.
- 3.27 The data search also provided several records of hedgehog (*Erinaceus europaeus*) within 1 km of the survey area. The scrub, grassland and garden habitats provide suitable forage, refuge and potential hibernation opportunities for hedgehog. Therefore, hedgehog may be present within the survey area.

Amphibians

- 3.28 The data search provided records of great crested newt (GCN), smooth newt (*Lissotriton vulgaris*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*) within 1 km of the survey area. There are no ponds within the site. An updated pond scoping and HSI survey carried out in April 2023 identified a total of six ponds within 0.25 km of the application boundary, which are described in Table 5 and presented in Appendix E. Table 6 presents the full HSI assessment results.

Table 5: Pond descriptions and photographs

Pond ref	Description	Photograph
P1	Irregular shaped pond at the southern end of a ditch network. The water is 10 cm deep at the margins, to no more than 1 m at the centre. The pond is brown tinged with signs of nutrient enrichment (algal blooms) and slight turbidity (2/5). Several mature and dead willows sprawl across the water. The drawdown area is approximately 1-2m wide and the	

	margins feature willowherbs (<i>Epilobium</i> spp.), creeping buttercup (<i>Ranunculus repens</i>) and yellow flag iris (<i>Iris pseudacorus</i>). No macrophytes other than algae were noted. The banks are gradually sloping and support bramble and willow scrub with brash and log piles. The wider area is wet, and cattle poached.	
P2	A second pond located along the dry ditch network. The water is 20 cm deep at the margins leading to no more than 1 m at the centre. The water has a brown hue and is turbid (3/5). Marginal vegetation is sparse and limited to creeping buttercup and grasses; no macrophytes were noted. Some small algae blooms are indicative of nutrient enrichment. Willow saplings are present in the water and mature willows occur along the bank edge. The banks are steep and vegetated by common nettle, ivy, cleavers (<i>Galium aparine</i>), broadleaved dock and perennial rye grass (<i>Lolium perenne</i>).	
P3	A third pond located along the same ditch system. The water depth is 10 cm at the margins to 1 m at centre. The water has a milky hue and is turbid (3/5), but clearer at the margins. The substrate comprises thick organic matter and marginal species include marsh marigold (<i>Caltha palustris</i>), watercress (<i>Nasturtium officinale</i>) and creeping buttercup. The banks are steep, with mature oak (<i>Quercus robur</i>), willow, ivy, lesser celandine (<i>Ficaria verna</i>) and bramble scrub.	
P4	A dry pond, not considered to be suitable for GCN.	N/a

P5	A shallow depression within heavily poached wet grass ley. The pond is likely ephemeral, with a water depth of 1 cm at the edge, to no more than 20 cm at the center. The water is clear (1/5 turbidity) and abundant grass is present.	
P6	A larger pond located in the centre of an adjacent field. The water is 20 cm at the margins, extending to approximately 1.5 m deep in the middle (it appears deeper and more permanent than the other ponds). The water is slightly turbid (2/5). No macrophytes were noted, and the marginal vegetation comprises grasses and willowherbs. Mature willows are present on banks and over hanging the pond. The banks are steep with trees and bramble scrub. The wider area is wet and cattle poached.	

Table 6: HSI assessment results (excluding dry pond P4)

Pond	P1	P2	P3	P5	P6
Distance from site (m)	42	86	216	164	171
Geographic location	1	1	1	1	1
Pond area (m2)	0.1	0.1	0.1	0.05	0.1
Pond permanence	1	1	1	0.1	0.9
Water quality	0.67	0.67	0.33	0.33	0.33
Shade	0.7	0.4	0.6	1	0.6
Waterfowl presence	0.67	0.67	0.67	0.67	0.67
Fish presence	1	1	1	1	1
Pond density	1	1	1	1	1
Terrestrial habitat	0.67	0.67	0.67	0.33	0.33
Macrophyte cover	0.8	0.35	0.5	0.8	0.35
HSI Score	0.64	0.56	0.56	0.44	0.49
Pond Suitability	Average	Below Average	Below Average	Poor	Poor

- 3.29 All of the ponds found to hold water (P1, P2, P3, P5 and P6) were subject to an eDNA survey to determine the presence/absence of GCN. All ponds returned a negative result; full results are presented in Appendix H.
- 3.30 Habitats within the site provide some small pockets of suitable terrestrial habitat for amphibians, in the form of scrub and unmanaged modified grassland, which although is species-poor, offers suitable cover and foraging opportunities for common amphibians.

Reptiles

- 3.31 The data search provided no records of reptiles within 1 km of the survey area. The areas of unmanaged grassland and scrub provide some suitable foraging and shelter opportunities for reptiles. However, given the lack of desk study records and poor connectivity to alternative suitable reptile habitat in the wider landscape, it is considered unlikely that reptile populations are supported by the site, and they are therefore not considered further within this report.

4. Evaluation and Assessment of Constraints

- 4.1 An assessment of potential impacts on designated sites, habitats and species and is presented below. This is based on the information available on the proposed development and the professional judgement of the ecologists that prepared this report. It considers legal requirements (see Appendix F) and relevant national and local planning policies. If the proposals are changed significantly, the assessment will need to be reviewed.

Development Proposals

- 4.2 The proposed development includes the construction of five residential dwellings and associated road access and garden areas. All the buildings present (B1, B2, B3 and B4) will be demolished and it is anticipated that all of the site will be cleared (Appendix B).

Designated Sites and Habitats of Principal Importance

- 4.3 There are no statutory wildlife sites within the search area and therefore no direct impacts are anticipated.
- 4.4 Golden plover is an Annex 1 qualifying feature of the Mersey Estuary SPA (as it is used regularly by 1% or more of the Great Britain population), alongside other passage and wintering ducks and wading birds, and non-breeding assemblage species. Pink-footed geese are a qualifying feature of the Ribble and Alt Estuaries and Martin Mere designated sites. Arable fields surrounding the site may represent habitat functionally linked to these designated sites, through the provision of foraging opportunities for wintering and migratory birds. However, whilst development close to arable land can cause disturbance to foraging birds, in this case potential significant effects are considered to be insignificant, due to:
- The distance between the proposed development site and the SPA/Ramsar sites. At the closest boundary, the Mersey Estuary is located 4.7 km to the south. Further afield, the Mersey Narrows and North Wirral Foreshore, the Ribble and Alt Estuaries and Martin Mere statutory designated sites are located between 13 km and 27 km from the site, beyond the Liverpool conurbation;
 - Bird atlas data returned no records of pink footed geese within the surrounding tetrads; furthermore, known pink footed geese feeding areas are located away from the proposed development site, with known geese favouring foraging sites close to St Helens, northern Knowsley and Sefton areas (RSPB, 2008). Atlas data returned a peak count of only two for golden plover;
 - The small scale of the development (0.24 ha) on a site with an existing B use class, which will result in no loss of arable farmland; and
 - Potential disturbance would be minimal at most and temporary, with a short construction period for a small number of residential dwellings.
- 4.5 Several non-statutory sites are located within 1 km of the survey area, including Cartbridge Lane Wood SBI, which comprises semi-natural deciduous woodland HPI, and lies approximately 45 m east of the site. The SBI and HPI could therefore be subject to negative impacts as a result of the scheme including disturbance during demolition and construction from noise, dust and run-off. During the operational phase of the scheme there may be increased human presence in the woodland from residents, however the woodland is already known to attract antisocial behaviour which may be ameliorated by a small residential development. There is potential for pets, including domestic cats, to have a detrimental impact by preying woodland fauna and water voles.

- 4.6 Impacts on the remaining non-statutory wildlife sites and HPI identified are considered unlikely given the distance from the site and the localised, small-scale nature of the scheme.

Other Habitats

- 4.7 Habitats to be removed comprise modified grassland (0.1 ha to be lost), dense mixed scrub (0.02 ha to be lost) and bramble scrub (0.01 ha to be lost). The remaining area to be cleared comprises 0.1 ha of urban habitats (buildings, hardstanding). These habitats have limited intrinsic ecological value as they are common, and the flora present is widespread.
- 4.8 The loss of small areas of species-poor semi-natural habitats is not considered to be a significant negative ecological impact. However, it is anticipated that the development will require removal of the mature weeping willow tree, which due to its size and age provides greater ecological value for a range of species.

Species

Bats

- 4.9 The building inspection identified the farmhouse (B1) and bungalow (B4) as having **high** suitability for roosting bats and the cottage (B2) and partially converted barn (B3) as having **low** suitability. However, no bats were confirmed roosting within any of the buildings during the updated emergence surveys. The bungalow and barn will be demolished and the farmhouse and cottage will be partly demolished to facilitate the current development proposals.
- 4.10 Although no roosting bats were found during the surveys, the buildings do offer PRFs. Whilst the updated surveys have continued to rule out the presence of a large roost, such as a maternity colony, available roosting features do have potential to be used by individual bats during the bat active season.
- 4.11 As bats are a mobile species, their potential future presence cannot be completely discounted. In the absence of appropriate mitigation, there is a low risk of works resulting in the disturbance and/or harm of individual bats. Demolition, particularly with respect to B1 and B4, will result in a decrease in suitable PRFs for bats within the site.
- 4.12 Habitats within and adjacent to the site were identified to provide moderate suitability for foraging and commuting opportunities bats, although the bat surveys recorded only low activity. In the absence of suitable mitigation, the proposed development has the potential to disturb individual foraging and commuting bats moving through the site through increased external lighting, during both the construction and operational phases of the development.

Badgers

- 4.13 If badgers are present in the surrounding area, there is a low risk of disturbance and entrapment of individuals during the construction of the proposed development.

Birds

- 4.14 The scrub, unmanaged grassland and trees provide suitable nesting habitat for birds and the buildings may be used by opportunistic breeding birds. As such, demolition and clearance of vegetation has the potential to disturb nesting birds if undertaken during the nesting bird

season (March - August inclusive), which would result in a breach of legislation (see Appendix G). Additionally, these works will lead to the loss of bird nesting habitat.

- 4.15 As stated above, impacts to wintering birds as a result of the development are considered to be negligible, given the small scale of the proposals and distance of the site from designated sites.

Other mammals (brown hare, European hedgehog etc)

- 4.16 The construction phase of the development has the potential to harm small mammals if any excavations are left uncovered overnight which they may fall into. Considering the relatively small scale of the development, it is not anticipated to pose any significant barriers to the dispersal of small mammals.

Amphibians

- 4.17 The eDNA survey of five ponds within 0.25 km of the application site returned negative results for GCN, therefore the species is considered to be absent from the site. In the absence of mitigation, site clearance could result in direct harm to individual common amphibians. This is not anticipated to significantly impact local common amphibian populations due to the relatively small area of suitable habitat within the site and the small scale of the proposals.

5. Mitigation and Opportunities

- 5.1 The recommendations set out below aim to ensure that the proposed development take account of important ecological features, legal requirements (see Appendix G), and relevant national and local planning policies. The National Planning Policy Framework (2021) specifically states that development should seek to minimise impacts, incorporate improvements, and provide net gains for biodiversity. If the proposals are changed significantly, the recommendations will need to be reviewed.

Designated Sites

- 5.2 Cartbridge Lane Wood SBI is located approximately 45 m from the site boundary. The Construction Environmental Method Statement (CEMP) will incorporate suitable mitigation for potential impacts to the designated site.
- 5.3 No contractors will enter the woodland during the construction phase and appropriate pollution control and prevention measures will be applied throughout the construction period. In the absence of statutory guidance in England it is advised that the following information published on the NetRegs website is adhered to during the works;
- Maintaining high standards of housekeeping throughout the duration of construction;
 - Speed limits will be enforced on the site access road and working areas will be dampened down during dry periods to prevent dust;
 - Covered wagons and skips will be used;
 - All stored materials and excavated topsoil will be placed in a bunded area protected from rainfall and runoff; and
 - Oil spill kits to be kept on site and drip trays or plant nappies to be used when refuelling and left under stationary machinery.
- 5.4 Cartbridge Lane Woods SBI and other SBIs in the surrounding area noted for supporting a population of water vole. There is no suitable habitat for the species within the site, however future homeowners with domesticated cats may result in predation of the local population. Mitigation will involve educating new homeowners on the vulnerability of water vole to cat predation and the presence of water vole within the wider locality, as part as the Home Information Pack. They will be encouraged to fit the collar of pet cats with a bell. RSPB studies have shown that this can reduce predation of birds by 41%, and predation of mammals such as mice and voles by 34% (RSPB, 2010). The collar should have a quick release buckle that 'pops' open easily, and which will allow the cat to free itself should it become snagged. There are also commercially available 'sonic' collars that are designed to alert the potential prey to the cat's presence, and these will also reduce predation of birds and mammals.

Other Habitats

- 5.5 If possible, the mature willow tree should be retained and adequately protected during the construction phase by establishing Root Protection Areas (RPAs), in accordance with BS5837. If the tree must be reduced, leaving the main stem as a monolith can benefit biodiversity through continuing to provide foraging and roosting opportunities for wildlife. The creation of brash and log piles along the periphery of the site and within the nearby SBI from cut material will also create opportunities for a variety of species.

- 5.6 Compensation for the loss of the mature tree and other habitats within the site will involve the planting of native trees, shrubs and climbers as part of the soft landscaping proposals for the scheme. It should be noted that the existing application for the site also proposes to undertake habitat improvements and creation within a proposed communal greenspace and orchard area.

Species

Bats

- 5.7 No bat roosts were identified during the surveys and as such the risk of impacts to bats is considered to be low. However, they are mobile species which may occasionally use buildings with suitable PRFs at any time. As a precautionary measure with respect to bats, the following Reasonable Avoidance Measures (RAMs) are recommended during works and should be adhered to throughout the development.
- Before any work proceeds, all contractors should be made aware of the possible presence of bats and the signs to look for (Appendix F);
 - Prior to works commencement, a bat box (Schwegler, Habitat or similar) will be installed on a suitable mature tree close to the site to provide an appropriate roosting features in case any bats are unexpectedly found during the works (see below);
 - Where possible, demolition should be carried out over winter between 1st October and 1st March, when hibernating bats are highly unlikely to be present;
 - Contractors will ensure the careful hand removal of all potential roosting features (e.g., fascia boards; roof tiles; and roof lining) with a suitably qualified bat ecologist on call; and
 - If bats are unexpectedly encountered, all works within that area will cease temporarily. The ecologist will attend site and carefully move the bat(s) wearing gloves, check for injuries and place the bat(s) within a suitable container before relocating the bat(s) to a bat.
- 5.8 Additional bat roosting features will be installed to compensate for the loss of suitable PRFs, provided primarily by B1 and B4. A further five tree mounted bat boxes will be installed on suitable trees (appropriate locations include Cartbridge Lane Wood or the tree lines to the north-west or south-west of the bungalow). New residential buildings will also incorporate the installation of three bat boxes suitable for installation of external walls, such as the 1FF or 1FQ Schwegler boxes or Vincent Pro boxes. Boxes mounted on external walls will be positioned close to the roof eaves, on south/west or south/western elevations, with a clear and unilluminated flight path.
- 5.9 Mitigation for foraging and commuting bats will include minimising disturbance during construction i.e., no night working and avoiding artificial light spill onto nearby habitats and tree lines. The completed development should incorporate a sensitive lighting scheme, designed in accordance with the Bat Conservation Trust guidelines (ILP 2018). There will be no light spillage onto trees with bat boxes installed and spillage onto adjacent foraging habitats will be minimised, with lighting not exceeding that necessary to provide safety and security. The use of LED luminaries with a warm colour temperature (< 2700K) will also reduce disturbance to foraging and commuting bats, as will using dimmer settings or motion sensors overnight.

Badgers

- 5.10 During construction, any excavations or open pipework associated with works should be covered overnight or fitted with egress boards to prevent animals becoming trapped.

Birds

- 5.11 Any building demolition and vegetation removal works should take place outside the breeding bird season which runs from March until August inclusive to prevent any impacts upon nesting birds. Any demolition and clearance that must be carried out within the bird breeding season will be subject to a pre-clearance bird survey carried out by a suitably experienced ecologist. No works will be carried out within 5 m of an identified nest until the young have fledged and are no longer returning to the nest site. Works will only be undertaken once a scheme ecologist has declared the nest to be no longer in use.
- 5.12 In order to compensate for the loss of potential nest sites, six bird boxes will be installed on mature trees at or surrounding the site. A combination of open-fronted and hole-fronted boxes (with holes of various diameters to suit a range of species) will be used, as follows:
- 3 x Schwegler 2H open fronted ideal for robins, wagtails and wrens.
 - 3 x Schwegler 1B - available with 26 mm and 32 mm hole.

Other mammals (brown hare, European hedgehog)

- 5.13 The site provides opportunities for hedgehogs and there are records in the surrounding area. The new development will incorporate 'hedgehog highways', by leaving gaps (15 cm) in the base of boundary/residential property fencing to allow the movement of hedgehogs throughout the site.

Amphibians

- 5.14 Great crested newts are considered to be absent from the site, and no further survey or mitigation is required in respect of this species. During any works within the site, the following precautionary measures will be adopted to minimise impacts on common amphibians:
- Before works commence, all contractors will be aware of the potential to encounter common amphibians (see Appendix F);
 - The working footprint should be kept to a minimum;
 - Any trenches or other excavations required within the site will be backfilled before nightfall, or a ramp left to prevent amphibians from becoming trapped within them. Trenches should be carefully inspected in the morning prior to commencement of works;
 - All stored materials should be raised off the ground, on pallets stored over habitat of low value to amphibians such as areas of hardstanding; and
 - Common amphibians encountered at any time during works should be moved to a safe location away from the works and placed within a similar habitat to which they were found.

Enhancement measures

- 5.15 An ecologist can provide site specific advice on ways to enhance the wildlife value of the final development and contribute towards a net gain in biodiversity. Simple examples of enhancement measures which could be considered and designed into the proposals include (but are not limited to):

- Log/brash piles can be created from any felled trees to attract invertebrates and fungi, which will also provide shelter and foraging resources for small mammals and amphibians; and
- Planting of native berry bearing shrubs to improve the habitat for foraging bats, nesting birds and invertebrates.

Re-survey of the Site

- 5.16 If no works are undertaken on site within 12 months of this survey or if any changes to the proposals are made, a further ecological survey may be necessary (because of the mobility of animals and the potential for colonisation of the site).

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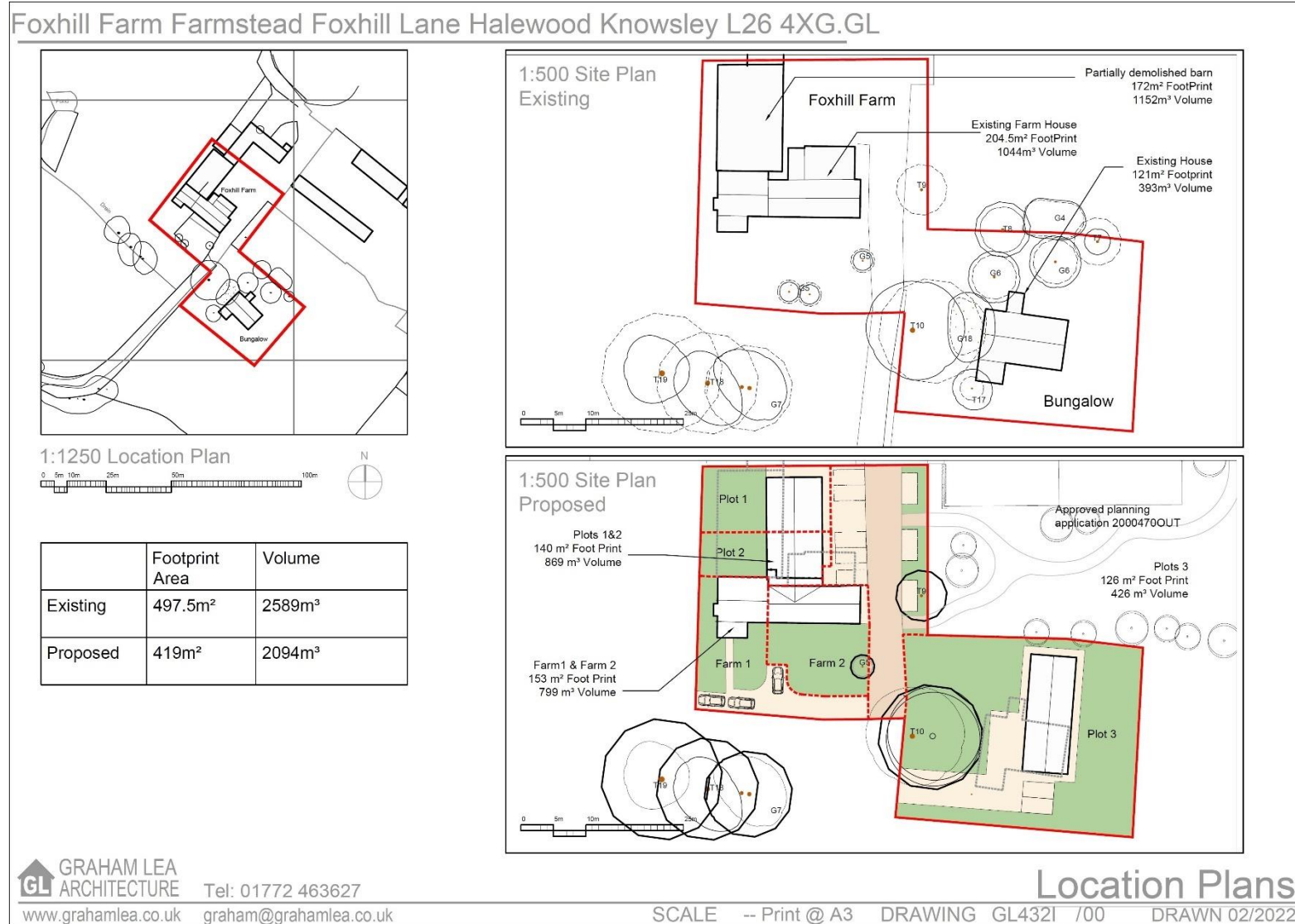
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Appendix A – Bat Roost Potential and Habitat Suitability Categories

Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape (Collins, 2016).

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

Appendix B – Proposed Development Plan



Appendix C – UKHab Plan and Bat Surveyor Locations



Appendix D – Building Description and Inspection Results

Building Number	Description	Photographs
B1 (unoccupied)	<u>Overview</u> A large two-storey neglected farmhouse with rendered breeze-block walls and two parallel double-pitched roofs, both orientated north-west to south-east (Plate 1). Both roofs are covered with interlocking tiles over a bitumen felt liner. The southern part of the farmhouse adjoins the cottage (B2) and the northern part has a lean-to extension located on its north-western elevation. The building has UPVC windows and features a small mono-pitched roof over the ground floor windows on the south-west elevation and a mono-pitched porch at the rear (Plate 2). A heavily degraded timber soffit box and associated guttering lines the roof verge along the north-east and south-west elevations. The gables are mortared and lack barge boards. <u>External Inspection</u> The ridge along the northern elevation appears to be well sealed, although there are some gaps beneath the roof tiles close to the roof verge, where bats could potentially roost under or gain access to the loft void. The soffit is also rotten in many places along the roof verge, with large gaps creating potential access points for bats along the main roofs and the lean-to extension (Plates 3 and 4). At the apex of the south-eastern gable there is a gap below the ridge tile, providing a PRF (potential roosting feature) for bats (Plate 5). The wooden porch on the same elevation is rotting, and the gaps between the wood and tiles may provide opportunities for crevice dwelling bats. Similar gaps are present at uncovered gable verges and the edge of the lean-to roof along the north-western elevation (Plate 6). The roof tiles on the south-western elevation are generally well sealed, although the soffit is very rotten in places with large gaps. There is a brick chimney with lead flashing surrounding the base, which has a small gap in the brickwork towards the base. Viewed from the north, there are also several small gaps along the ridgeline and the soffit above the alleyway between the two buildings is very rotten with large gaps (Plate 6). <u>Internal Inspection</u> Internally, the ground floor appeared to have been recently used. All the doors and windows across both floors are well sealed and in good condition (Plate 7). At the entrance of the building, the ceiling joists are exposed, however no obvious gaps with suitability for bats were present (Plate 8). The lean-to extension of the north-western elevation has a pitched ceiling and does not feature a roof void. On the first floor, there is a small hole in the ceiling above the hot water tank, potentially providing an access point from the loft space above. However, as the building is unoccupied and likely unheated, this would be unlikely to attract bats. In general, the interior space across both floors is well lit from uncovered windows and is unlikely to provide suitable roosting opportunities or access points for bats. There are two access hatches into the roof voids on the first floor; both voids could not be accessed fully as they were not boarded. Insulation was present between joists across the majority of the visible loft space. The southern (larger) loft void above the bedrooms is divided into sections by brick walls. A small hole was noted along the ridge with some light ingress just above the ridge beam, which may provide possible access for bats. The roof is lined with traditional bitumen felt, which is generally well-sealed although some sections are starting	  Plates 1 and 2: External views of the farmhouse (front and rear elevations)   Plates 3 and 4: Degraded soffit box along main roof and lean-to extension   Plates 5 and 6: Gap at south-eastern gable end below ridge tile gaps at roof verges on north-west elevation

	to degrade and there are minor gaps between overlapping sections, which could be used by roosting bats. Rat and mouse droppings were observed around the loft hatch. The northern loft void above the bathroom leads to a similar space, with more cross trusses present and is only partly insulated. The felt lining is in good condition and tightly overlapped at the apex. Mouse droppings were observed across the floor of the roof void. No bats or signs of roosting bats were observed in either loft void. Overall, the farmhouse (B1) is assessed as providing high suitability for roosting bats. The building provides multiple PRFs, primarily associated with exterior features, which have developed due to lack of repair work and maintenance to the building.	 Plates 7 and 8: Internal space and stripped area of ceiling on ground floor  Plates 9 and 10: Internal loft spaces
B2 (currently inhabited)	<u>Overview of building</u> A smaller two storey property (referred to as the cottage) adjoins onto the north-western elevation of the farmhouse (B1) (Plate 11). The cottage is of a similar construction to the farmhouse but is in a much-improved state of repair and is currently inhabited by site owners. The building has a mono-pitched extension to its south-western elevation. A red brick chimney protrudes from the north-western elevation. The main roof is double pitched and covered with interlocking tiles, with a timber soffit box along the eaves. The cottage adjoins the wall of B3 along the north-eastern elevation. <u>External Inspection</u> The cottage features timber framed windows which appear to be well sealed with no potential access for bats. The interlocking roof tiles are flush with no gaps between them or along the ridge line. The soffit boxes (to the main roof and lean-to extension) are generally in good condition, although a gap was noted between the soffit box and roof tiles on the lean-to extension (Plate 12). A similar gap is also present at the southern corner of the main roof, where it adjoins B1 (Plate 13). These gaps may provide access into the loft void if suitable gaps are present under the tiles. <u>Internal Inspection</u> The building is warm and well-sealed internally. The single main (not boarded) loft void could be viewed from a loft hatch on the first floor. A plastic roof lining appears new and is well sealed. There is no ridge beam, but cross trusses are present every 0.5m and there is thick insulation across the floor of the void (Plate 14). No light	 Plates 11 and 12: Exterior view from the rear garden; gaps at roof verge to lean-to extension  Plates 13 and 14: Potential access gap at southern corner of main roof; internal loft void

	ingress, including from the corners of the loft (corresponding with gaps observed during the external inspection) was observed. Mouse droppings were evident surrounding the loft hatch. No bats or signs of roosting bats were recorded. Overall, the cottage (B2) is assessed as providing low suitability for roosting bats. The building is in good condition and PRFs are limited to open gaps at the corners of the roof which may not provide access to suitability sheltered roosting locations.	
B3	<u>Overview of building and external inspection</u> A partially converted barn is essentially the shell of a building with solid red sandstone walls and no roof (Plates 15 and 16). Construction ceased several years ago and never re-commenced; scaffolding is still installed around part of the barn. Some breeze block walls are present towards to southern part of the barn and metal and concrete lintels for windows/doors have been installed along the south-east and north-western elevation. There are no windows or frames currently installed. The inspection found no evidence of bats. Potential roosting features for bats include gaps and crevices in the stone walls and gaps in lintels on the south-eastern elevation. However, the building is not watertight and is exposed to the elements, which reduces the suitability of these PRFs. Overall, the barn is considered to have low suitability for roosting bats.	 Plates 15 and 16: External views of partly completed barn
B4 (Bungalow)	<u>Overview of building</u> A dormer bungalow is located to the south of the other properties within the site, surrounded by dense scrub and unmanaged grassland (Plate 17). The bungalow has not been occupied for several years and is in a poor state of repair. The main roof is hipped and covered with interlocking tiles; it features three dormers and a chimney on the north-eastern pitch. A corrugated extension is also present on the north-eastern elevation and a porch overhangs an area of decking extending from the south-western elevation. <u>External Inspection</u> The small flat roofed (corrugated metal) extension to the northern elevation has timber panelling across the external walls, many areas of which are rotting and falling loose which could offer PRFs for crevice dwelling bats. The main roof verge along the northern elevation is generally well sealed, however there are some gaps present in the lead flashing around the chimney. Across all elevations of the main roof there are several missing/slipped roof tiles, including ridge tiles at adjoining sections (Plate 20). The majority do not appear to create suitable access gaps for bats, however where tiles are missing completely there may be access underneath adjacent tiles or the liner and potentially into the loft void. The two dormers at either end of the main ridge feature gaps at the verge and apex of their pitched roofs and possible gaps between timber and lead flashing and around the UPVC window, where external timber structure has degraded over time (Plate 20). The flat-roofed dormer on the south-western elevation has sections of hanging felt, which has come loose and may offer suitable PRFs for roosting bats (Plate 21). The south-western elevation also features bay window with a short section of roof extending over it. Timber at the roof verge is rotten and there are large gaps at either side of the bay window, providing potential access and roosting opportunities for bats (Plate 22). Along the north-western elevation, a large hole is present in the soffit box, however elsewhere the boarding is relatively well sealed. There is also an air vent lacking any mesh,	  Plates 17 and 18: External views of bungalow and surrounding dense vegetation   Plates 19 and 20: Degraded timber cladding on extension and slipped/missing tiles across main roof

which may provide a potential access point (Plate 24).

Internal Inspection

Internally, all the UPVC windows appear well sealed. On the ground floor there is built in cupboard with potential access to the exterior where the brick wall meets the roof verge (Plate 26). The pipe coming from the exterior vent provides a potential access point into the building (Plate 25) and inside the bathroom there is a missing wooden panel providing access to the dormer rooms upstairs.

On the first floor there are two rooms, surrounded by a sloping roof void which was be viewed through open hatches (Plates 27 and 28). It was noted that the upper rooms were significantly warmer than the rooms on the ground floor. The underside of the main roof is lined with tradition bitumen felt which was degraded in some areas, with torn sections and gaps between overlapping layers. Wooden rafters extend to meet large wooden beams with trusses where they meet the internal walls. No light ingress could be seen, although insulation covered the floor of the void. Mice droppings were observed within the crawl space. No bats or evidence of bats was observed.

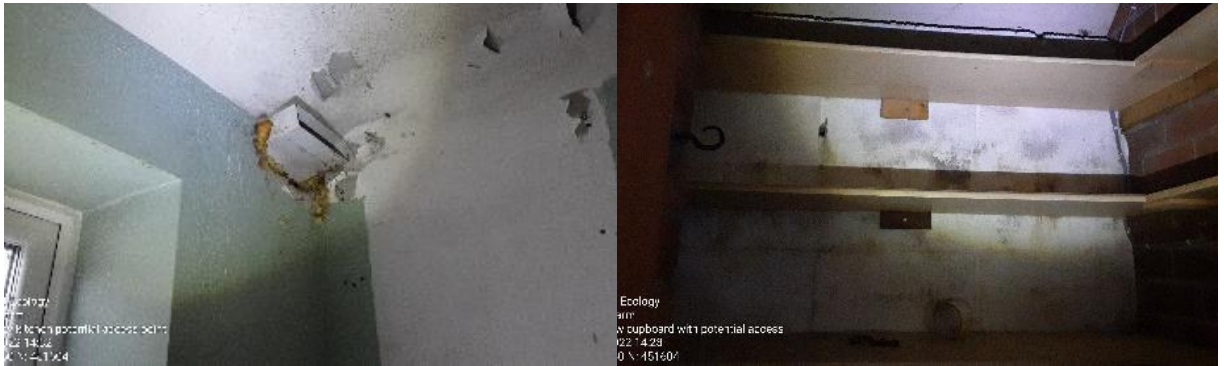
Overall, the bungalow is considered to have **high** suitability for roosting bats.



Plates 21 and 22: Dormer on south-western elevation and gaps at adjacent bay window



Plate 23 and 24: Eastern elevation hole in soffit box and air vent

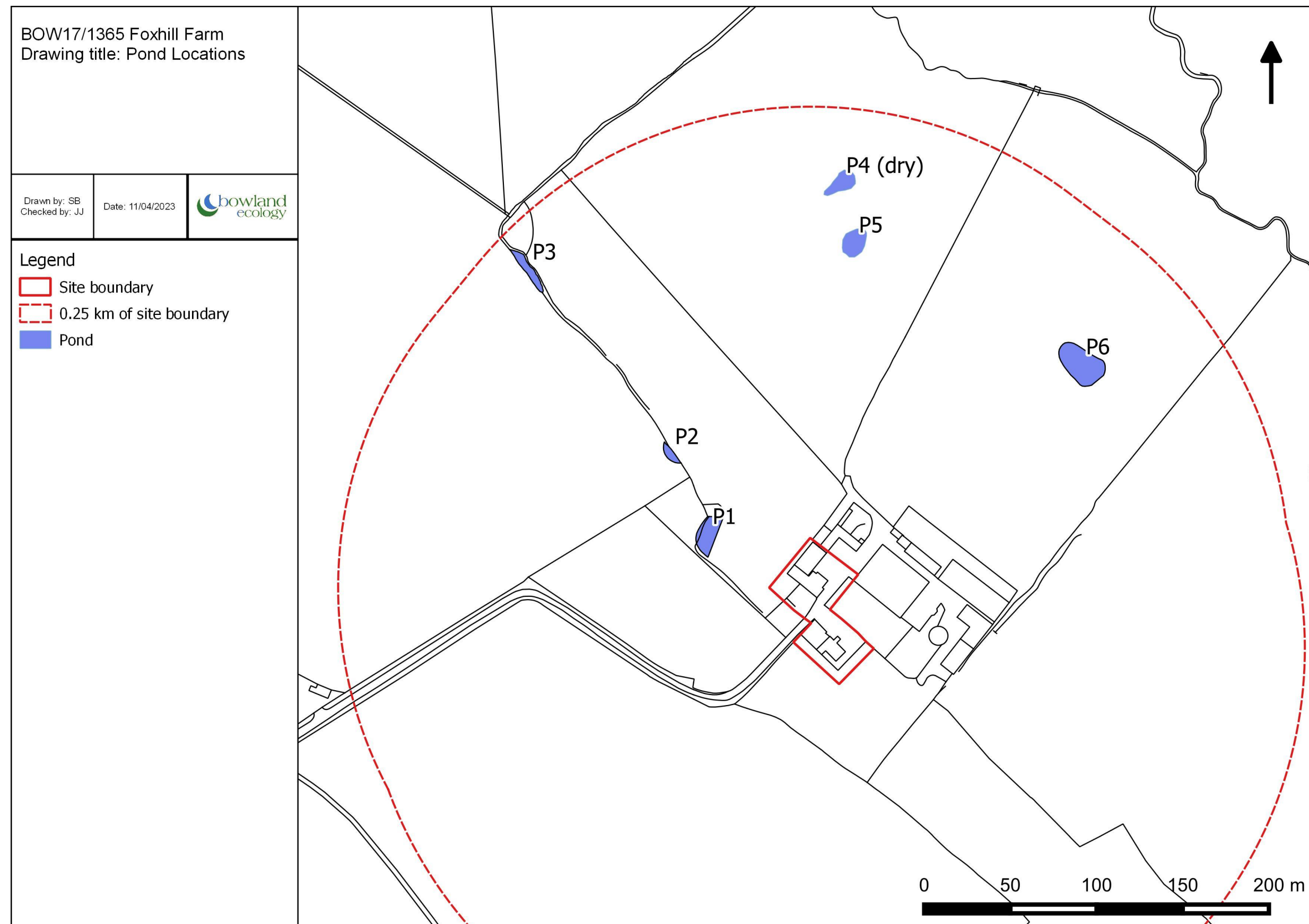


Plates 25 and 26: Potential access into building via air vent and gap at roof verge inside cupboard



Plates 27 and 28: Loft voids (crawl space around upper rooms)

Appendix E – Pond Location Plan



Appendix F – Information Sheets for Contractors

Amphibians

Information, legal responsibilities and best practice for the construction industry



Legal Information

In England it is **illegal** to deliberately capture, injure or kill a GCN, deliberately disturb a GCN, deliberately take or destroy GCN eggs, damage or destroy a breeding site or resting place used by a GCN. Penalties on conviction: the maximum fine is £5,000, up to six months in prison, per offence and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery. The following points are defences:

- ✓ Tending/caring for a GCN solely for the purpose of restoring it to health and subsequent release.
- ✓ Mercy killing where there is no reasonable hope of recovery (provided that person did not cause the injury in the first place – in which case the illegal act has already taken place).

Good to know-

- Newts are also carriers of the waterborne fungi- chytrid fungus. This fungus can be spread between water bodies and can cause the disease chytridiomycosis. If any work is being carried out around standing water then disinfection of footwear and equipment is important to prevent the spread of the disease.
- If a great crested newt is found before or after work (for example, pond management work) is commenced, then **work should be immediately postponed** and then started another time or with different methodology. If the newts cannot avoid being harmed then a license must be applied for.

Life cycle and seasonal appearances

April-May= This is when newts undertake courtship displays and mate with females. Certain amphibians can start this process as early as February.

June-August= Larval growth and development of newly hatched juveniles- This event can occur anytime between March and October (depending on pond conditions and other factors such as climatic conditions)

August-October= Metamorphosis and juvenile emigration to terrestrial environments occurs at this stage

November-February= Hibernation on land

February-May= Emergence of adult form newts and dispersal to ponds

Other protected amphibians

The other two species of **newts** (**smooth** and **palmate**) are **protected under Section 9 (5) of the Wildlife & Countryside act 1981**, which prohibits the 'sale, barter, exchange, transporting for sale and advertising to sell or to buy. Common toads and common frogs are also protected under this legislation. **The natterjack toad** (which are smaller than common toads at 6-7cm) are given **full protection** by section 9 of the same act due to the fact they are a threatened and rare species in the UK, being confined to only a couple coastal territories. It is an offence to 'intentionally kill, injure or take (capture, etc); possession; intentional disturbance whilst occupying a 'place used for shelter or protection' and destruction of these places; sale, barter, exchange, transporting for sale or advertising to sell or buy'.



Common frog (top), common toad (middle), natterjack toad (bottom)

Key ID Features

Smooth Newt (*Lissotriton vulgaris*)

Egg stage- Smooth eggs are indistinguishable against palmate newt eggs, are rounded (not oval) and a grey/brown colour when freshly laid.

Larvae stage- Larvae are up to 3-4cm long (shorter than GCN), and have less obvious speckling and smaller gills.

Adult stage- Adult smooths measure up to 10cm, have a paler body than GCN with an orange belly stripe. Smooths lack some features of palmate newts (notably pink chin, and a cream spot). There is a slight silver/ orange strip along the base of the tail. The crest is wavy along whole back and tail, unlike palmates where it is more of a ridge shape.



(Young smooth)

Species protected by UK and European law Great Crested Newt (GCN)- *Triturus cristatus*



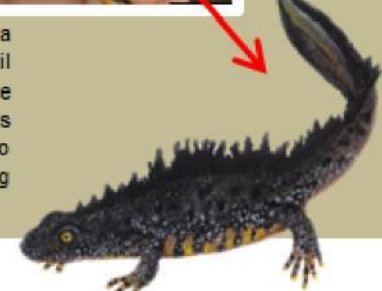
GCN eggs are oval shaped with a pale yellow to white colour, these are usually found singly wrapped in folded leaves. Smooth and Palmate eggs are grey/ brown when freshly laid.

Adults are black, and are also covered in bright yellow spots on the underside and irregular blotches.



Larvae (Efts) are up to 5-9cm long and have distinguishable black speckling on the tail and body

Adults also have a jagged crested tail with a recognisable stripe. Both males and females also have white speckling on the sides.



Palmate Newt (*Lissotriton helveticus*)

Egg stage- Palmate eggs are indistinguishable against smooth newt eggs, are rounded (not oval) and a grey/brown colour when freshly laid.

Larvae stage- Larvae are up to 3-4cm long (shorter than GCN), and have less obvious speckling and smaller gills.

Adult stage- Adult palmates measure up to 10cm, have a paler body than GCN with an orange belly stripe. They also have a pink chin with no spots/ speckles and a cream spot on both hind feet.



References:

Acknowledgements:

Version 10 December 2018

BATS

Information, legal responsibilities and best practice for the construction industry



Legal Protection

All UK Bat species are protected by European and UK law, in practical terms this means it is an offence to:

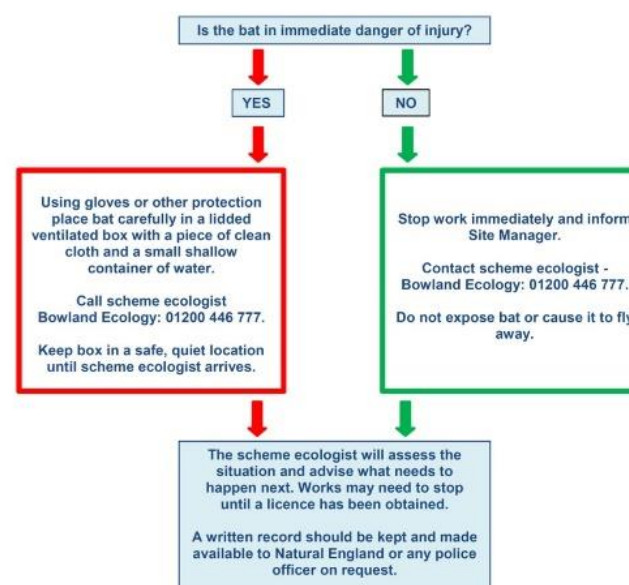
- Deliberately capture, injure or kill a bat;
- Deliberately disturb bats;
- Damage or destroy a breeding site or resting place (even if bats are not occupying the roost at the time);
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place;
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat.

Penalties on conviction: the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

Defences include:

1. Tending/caring for a bat solely for the purpose of restoring it to health and subsequent release.
2. Mercy killing where there is no reasonable hope of recovery (provided that person did not cause the injury in the first place – in which case the illegal act has already taken place).

Found a bat during unsupervised works?



Field signs of bat presence:

- Live or dead bats: the smallest UK bat species, the pipistrelle is only 3.5-4.5cm long.
- Droppings: bat droppings look like mouse droppings but will crumble between your fingers (they are dry and made entirely of insects).
- Feeding remains: piles of butterfly/moth wings are often left below bat feeding perches.



Places that bats may use in buildings



Schematic from www.bats.org.uk

Bats can roost in the following places:

- The top of gable end or dividing wall;
- The top of chimney breasts;
- Ridge and hip beams and other roof beams;
- Mortise and tension joints;
- All beams/ceilings/pipework (free hanging bats);
- The junction of roof timbers, especially where ridge and hip beams meet;
- Behind purlins;
- Between tiles and the roof lining;
- Under flat felt roofs;
- Under barge boards;
- In cavity walls;
- In cracks in stone or concrete;
- Behind peeling paint/wall coverings;
- Gaps behind window and door frames;
- Between window panes and timber boarding.
- In trees (cracks/holes/ivy cladding).

Why wear gloves?

There is a small risk that some bats carry a rabies virus – European Bat Lyssavirus. The purpose of wearing gloves is to reduce the chance of being bitten, as the virus is transmitted via bat saliva. Thick leather gloves are appropriate for removing a bat from imminent danger but these should be clean.

In the event that you are bitten, wash the wound, gently but thoroughly, with soap and water. Speak to a health professional immediately, advising them that you have been bitten by a bat.



References:

Bat Conservation Trust. August 2016. Why wear gloves when handling bats?
BCT Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition, 2016

version 1 August 2017

Appendix G – Legal Information

This report provides guidance of potential offences as part of the impact assessment. This report does not provide detailed legal advice and for full details of potential offences against protected species the relevant acts should be consulted in their original forms i.e. The Wildlife and Countryside Act, 1981, as amended, The Countryside and Rights of Way Act 2000, The Natural Environment and Rural Communities Act, 2006 and The Conservation of Habitats and Species Regulations 2017.

Species	Legislation	Offences	Notes on licensing procedures and further advice
Species that are protected by European and national legislation			
Bats <i>European protected species</i>	Conservation of Habitats and Species Regulations 2017 Reg 41	Deliberately ¹ capture, injure or kill a bat; Deliberate disturbance ² of bats; Damage or destroy a breeding site or resting place used by a bat. The protection of bat roosts is considered to apply regardless of whether bats are present.	An NE licence in respect of development is required in England. https://www.gov.uk/bats-protection-surveys-and-licences <i>European Protected Species: Mitigation Licensing - How to get a licence</i> (NE 2010) <i>Bat Mitigation Guidelines</i> (English Nature 2004) <i>Bat Workers Manual</i> (JNCC 2004) <i>BS8596:2015 Surveying for bats in trees and woodland</i> (BSI, 2015)
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.9	Intentionally or recklessly ³ obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Great crested newt <i>European protected species</i>	Conservation of Habitats and Species Regulations 2010 Reg 41	Deliberately ¹ capture, injure or kill a great crested newt; Deliberate disturbance ² of a great crested newt; deliberately take or destroy its eggs; damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by NE. https://www.gov.uk/great-crested-newts-protection-surveys-and-licences <i>European Protected Species: Mitigation Licensing - How to get a licence</i> (NE 2010) <i>Great Crested Newt Mitigation Guidelines</i> (English Nature 2001)
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.9	Intentionally or recklessly ³ obstruct access to any structure or place used for shelter or protection or disturb a great crested newt in such a place.	Licences issued for science (survey), education and conservation by NE.

Species	Legislation	Offences	Notes on licensing procedures and further advice
Birds	Conservation of Habitats and Species (Amendment) Regulations 2012	N/A	Authorities are required to take steps to ensure the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat. This includes activities in relation to town and country planning functions.
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.1	Intentionally kill, injure or take any wild bird; Intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; Intentionally take or destroy the nest or eggs of any wild bird. Schedule 1 species Special penalties are liable for these offences involving birds on Schedule 1 (e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover). Intentionally or recklessly ³ disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species.	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety. https://www.gov.uk/wild-birds-protection-surveys-and-licences https://www.gov.uk/prevent-wild-birds-damaging-your-land-farm-or-business
Other species			
Rabbits, foxes and other wild mammals (non SPI)	Wild Mammals (Protection) Act 1996	Intentionally inflict unnecessary suffering to any wild mammal.	Natural England provides guidance in relation to rabbits (Technical Information note TIN003, Rabbits- management options for preventing damage, July 2007) and foxes (which are also protected under the Wildlife and Countryside Act 1981 from live baits and decoys, see Species Information notes SIN003 (2011), <i>Urban foxes</i> and SIN004 (2011) <i>The red fox in rural areas</i> as well as other wild mammals. Lawful and humane pest control of these species is permitted.

¹ Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing ² Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong. Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided. Thus deliberate disturbance that does not result in either (a) or (b) above would be classed as a lower level of disturbance. ³ The term 'reckless' is defined by the case of Regina versus Caldwell 1982. The prosecution has to show that a person deliberately took an unacceptable risk, or failed to notice or consider an obvious risk. ⁴ The Wildlife and Countryside Act (1981) has been updated by various amendments, including the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006. A full list of amendments can be found at <https://jncc.gov.uk/our-work/wildlife-countryside-act/>

Site Designation	Legislation	Protection	Guidance
Local Sites	There is no statutory designation for Local Sites	Local Sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a Local Site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Further guidance can be found in the National Planning Policy Framework and the accompanying joint Circular (ODPM Circular 6/2005 & Defra Circular 01/2005), which is still valid.

Habitats & Species	Legislation	Guidance
Species and Habitats of Principal Importance for the Conservation of Biodiversity	Natural Environment & Rural Communities Act 2006 S.40 (which superseded S.74 of the Countryside & Rights of Way Act 2000).	S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England. Habitats and species of principal importance for the conservation of biodiversity in England (identified by the Secretary of State in consultation with NE) are referred to in S.41 of the NERC Act: http://webarchive.nationalarchives.gov.uk/20140605090108/http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx The list of habitats and species was updated in 2007 to ensure that it remained focussed on the correct priorities: https://jncc.gov.uk/our-work/uk-bap/ The criteria for selection included international threat, responsibility and importance, rate of decline/risk, importance of habitats for key species, and other important factors. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species.

Appendix H – Great Crested Newt eDNA Results



Folio No: E17272
 Report No: 1
 Purchase Order: BOW25
 Client: BOWLAND ECOLOGY
 Contact: Bowland Ecology

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 10/05/2023
 Date Reported: 18/05/2023
 Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
3137	Foxhill Farm - Pond 1	SJ 4590 86896	Pass	Pass	Pass	Negative	0
3138	Foxhill Farm - Pond 2	SJ 44956 86991	Pass	Pass	Pass	Negative	0
3139	Foxhill Farm - Pond 6	SJ 45225 86989	Pass	Pass	Pass	Negative	0
3140	Foxhill Farm - Pond 3	SJ 44894 87061	Pass	Pass	Pass	Negative	0
3141	Foxhill Farm - Pond 5	SJ 45137 56854	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Gabriela Danickova

Approved by: Jackson Young



Forensic Scientists and Consultant Engineers
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METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC:	Sample Integrity Check [Pass/Fail] When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
DC:	Degradation Check [Pass/Fail] Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
IC:	Inhibition Check [Pass/Fail] The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
Result:	Presence of GCN eDNA [Positive/Negative/Inconclusive] Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location. Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence. Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.



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