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# Ecological Impact Assessment for proposed new prison, bowling club, and boiler house on land adjacent to HMP Garth and HMP Wymott, Leyland

CGO Ecology Ltd

Christchurch

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# 1. Introduction

## 1.1. Background

CGO Ecology Ltd (CGO) was instructed by Mace Ltd, on behalf of the Ministry of Justice (MoJ), to conduct an Ecological Impact Assessment (EcIA) on land adjacent to Her Majesty's Prison (HMP) Garth and HMP Wymott, Leyland, Lancashire (centred on OS grid ref SD 502 205). The MoJ proposes a new prison as part of its New Prisons Programme (NPP), as well as a bowling club and boiler house to replace the loss of existing ones. The Local Planning Authority (LPA) is Chorley Council.

A Preliminary Ecological Appraisal (PEA) was conducted by Ramboll (Molesworth, 2020) and further PEA work was undertaken in additional areas by CGO Ecology (CGO) (Gleed-Owen, 2021a). Phase 2 ecology surveys were conducted by CGO in 2021, some of which are complete (Gleed-Owen, 2021b,c; Harrison & Gleed-Owen, 2021), and others which are ongoing or report in preparation.

This EcIA report follows Chartered Institute of Ecology and Environmental Management guidance on report-writing (CIEEM, 2017) and EcIA (CIEEM, 2018). It presents and evaluates the existing 'baseline condition' of the site; assesses the potential impacts of the development; sets out the proposed mitigation and compensation measures; identifies any residual impacts, and proposes suitable enhancements. Appendix 1 summarises the legislative and policy framework governing EcIA.

## 1.2. Proposed development

The proposed development is a hybrid planning application seeking: Outline planning permission (with all matters reserved except for access, parking and landscaping) for a new prison (up to 74,531.71 sqm GEA) (Class C2A) within a secure perimeter fence following demolition of existing buildings and structures and together with associated engineering works; Outline planning permission for a replacement boiler house (with all matters reserved except for access); and Full planning permission for a replacement bowling green and club house (Class F2(c)).

The new prison will occupy an area of 18.40ha on land to the north of HMP Wymott. The site is currently occupied by a sheep farm, stables, bowling club, and boiler house.

The bowling club will occupy 0.63ha on land to the south of HMP Wymott. It will replace the one lost to the new prison development.

The boiler house will occupy 0.23ha on land between HMP Wymott and HMP Garth. It will replace the one lost to the new prison development.

The indicative site layout proposes a range of buildings and facilities typical of a Category C resettlement prison, including:

- Seven new houseblocks each accommodating up to 245 prisoners (1,715 prisoners in total), totalling c.53,472 sqm GEA;
- Supporting development including kitchen, workshops, kennels, Entrance Resource Hub, Central Services Hub and support buildings, totalling c. 21,060 sqm GEA
- Ancillary development including car parking (c. 525 spaces), internal road layout and perimeter fencing totalling 1326 linear meters enclosing a secure perimeter area of 10.5 ha.

The house blocks will be four storeys (plus pitched roof) in height, whilst the other buildings will range from one to three storeys.

The new prison will be designed and built to be highly sustainable and to exceed local and national planning policy requirements in terms of sustainability.

The MoJ's aspirations include targeting near zero carbon operations, 10% biodiversity net gain, and at least BREEAM 'Excellent' certification, with endeavours to achieving BREEAM 'Outstanding'.

### 1.3. Objectives

The aim of this report is to provide an EcIA of the proposed development and its zone of influence (ZOI) to help obtain planning consent. The report must meet standard industry guidelines for EcIA (CIEEM, 2018) and ecological report-writing (BSI, 2013; CIEEM, 2017).

The objectives are to:

- Identify legally-protected sites and other designated sites ('local sites') that may be impacted.
- Identify seminatural habitats, particularly priority habitats, that may be impacted.
- Identify populations of protected, rare, and notable species that may be impacted.
- Identify the potential effects of the proposed development on the site's important ecological features.
- Describe the mitigation and compensation measures proposed to avoid or minimise these potential impacts.
- Identify any residual effects that are likely to remain.
- Propose ecological enhancement measures to fully offset any residual effects, and achieve at least 10% BNG.

### 1.4. Supporting information

The Appendices of this report provide the following supporting information:

Appendix 1 – Legislative and policy framework.

Appendix 2 – PEA and phase 2 ecology reports.

### 1.5. Author

The author is Dr Chris Gleed-Owen BSc (hons) PhD MCIEEM, Director & Principal Ecologist of CGO Ecology Ltd, an ecological consultant since 2008 (13 years). Survey licences: CL09 great crested newt (GCN, *Triturus cristatus*), sand lizard (*Lacerta agilis*), smooth snake (*Coronella austriaca*), natterjack toad (*Epidalea calamita*), Roman snail (*Helix pomatia*). Previous mitigation licence-holder for smooth snake and/or sand lizard (6), and badger (*Meles meles*) sett closure (3). Experienced surveyor of Phase 1 habitats, National Vegetation Classification (NVC), flora (FISC level 4 botanist), vertebrates, and invertebrates.

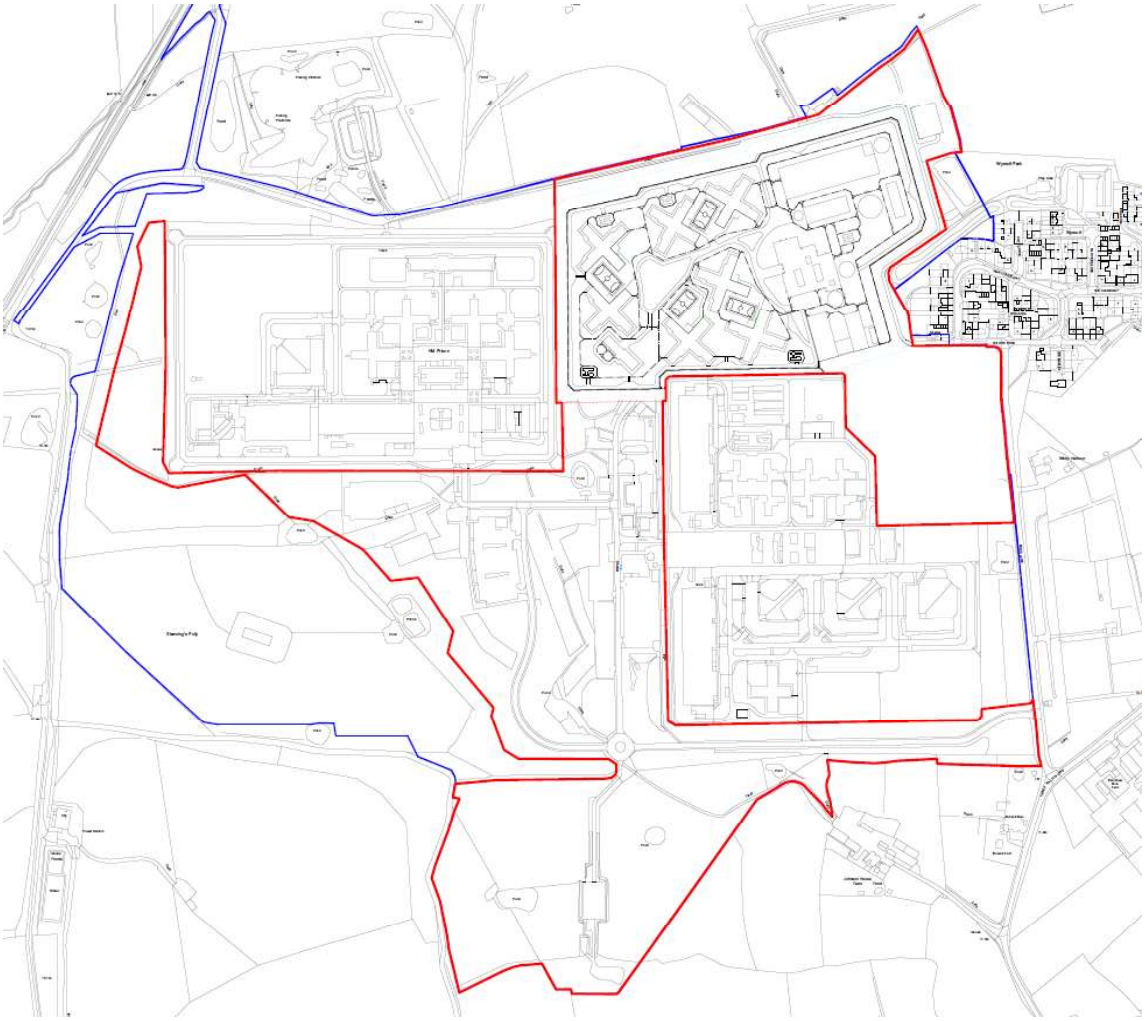

Figure 1 – Development site boundary (red line) and MoJ ownership boundary (blue line).

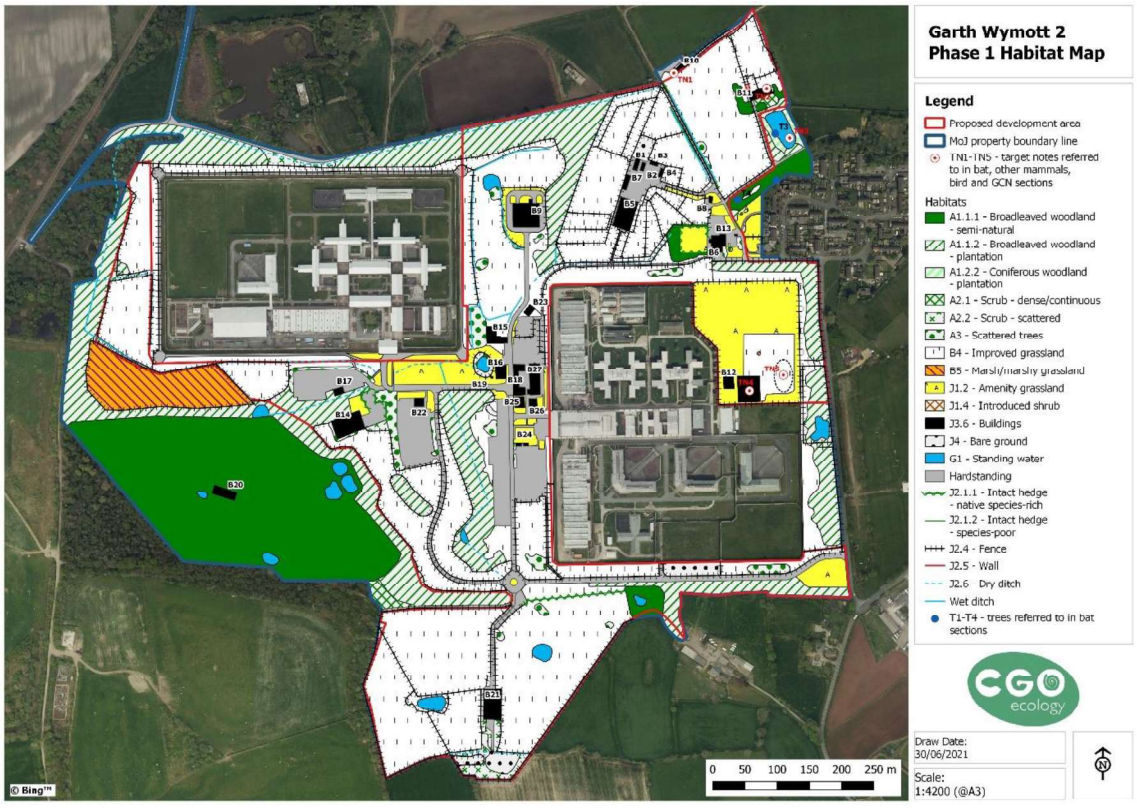


Figure 2 – Phase 1 habitat map derived from redrawn Ramboll data, and CGO data.

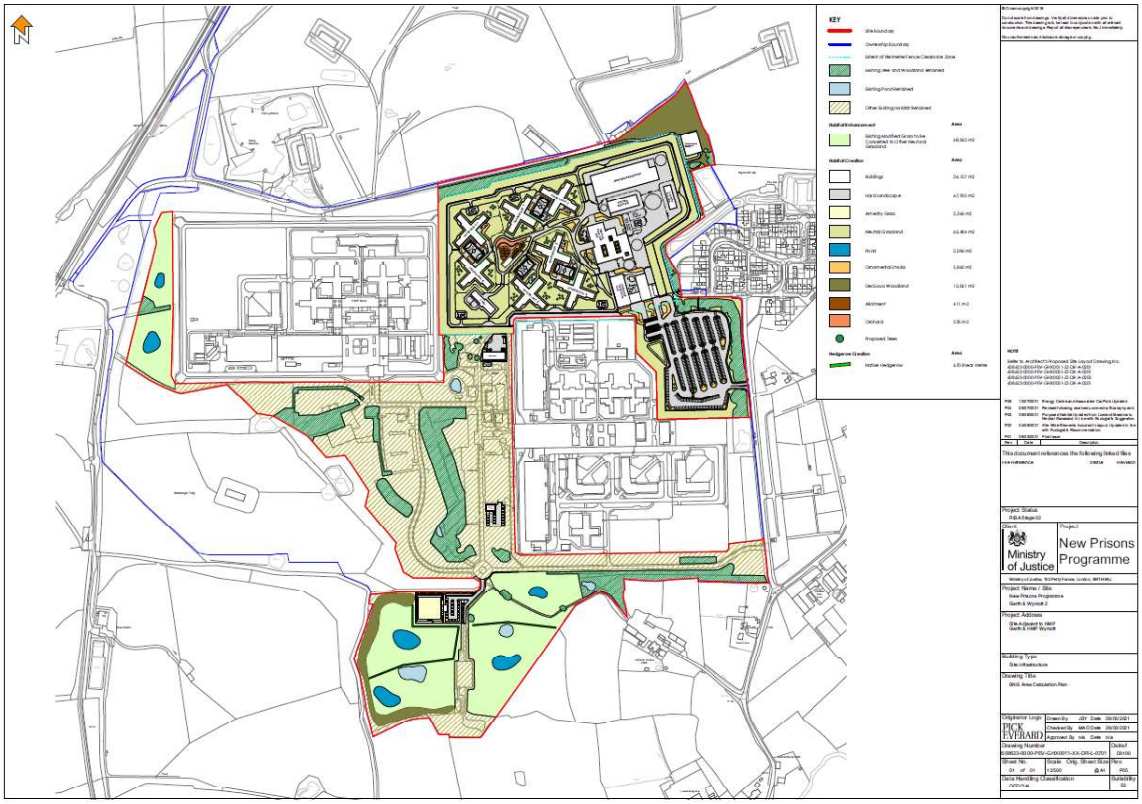


Figure 3 – Proposed development and landscaping plan, with habitat areas for BNG purposes, produced by Pick Everard.

## 2. Methodology

### 2.1. Scoping

A Preliminary Ecological Appraisal (PEA) of most of the application area was conducted by Ramboll in 2020 (Molesworth, 2020). This was used as the basis for embarking on phase 2 ecology surveys. An additional area within and northeast of HMP Wymott was subsequently included in the proposed new prison site area, and was subjected to a PEA by CGO in 2021 (Gleed-Owen, 2021a). Two further areas for the proposed bowling club and boiler house have not been formally surveyed, as sufficient evidence was already available from the Ramboll PEA and CGO phase 2 surveys.

### 2.2. Desk studies

Ramboll (Molesworth, 2020) sought a 2km data search from Lancashire Environment Records Network (LERN) which contributed to their PEA. The results were made available to the subsequent CGO PEA (Gleed-Owen, 2021a).

Online resources including Defra MAGIC website (https://magic.defra.gov.uk/MagicMap.aspx) were consulted for protected sites and species within a 5km radius, and for general habitat and landscape information.

### 2.3. Extended Phase 1 Habitat Surveys

Ramboll conducted a Preliminary Ecological Appraisal (PEA) comprising an Extended Phase 1 Habitat Survey on 21st and 22nd September 2020 in fine, dry weather, with occasional scattered cloud (Molesworth, 2020; see Appendix 2). The report included a 2km data search from LERN. Advice on phase 2 surveys was also received from Greater Manchester Ecology Unit (GMEU) acting on behalf of Chorley Council. GMEU scoped out the need for Winter Bird Surveys (WBS), Breeding Bird Surveys (BBS), hazel dormouse, badger, otter, and invertebrate surveys (Teresa Hughes, email to Chorley Council, 29/10/2021).

CGO conducted a PEA of two additional areas to the northeast of the site on 24th February 2021, in mild overcast weather, with occasional light rain (Gleed-Owen, 2021a; see Appendix 2). Surveys mapped habitats in line with JNCC (2010) guidelines, extended to include survey and assessment of protected and notable species interests. The season was suboptimal for species recording, but adequate for habitat mapping and assessment of the potential for protected and notable species presence. The ground was waterlogged across almost the whole site in February 2021, which implied that reptiles would be unlikely to inhabit the site, except potentially on localised higher ground.

Based on the Ramboll PEA, Mace instructed CGO to conduct phase 2 ecology surveys in 2021 of the following potentially-impacted groups: bats, water vole (*Arvicola amphibius*), GCN, reptiles, Invasive Non-Native Species (INNS). Additional evidence from the CGO PEA led to phase 2 surveys for barn owl (*Tyto alba*) and suspected 'fossorial' (terrestrial) water voles.

Phase 2 ecology surveys were conducted by CGO and subconsultant Haycock & Jay Associates (HJA) throughout the February-July 2021 period. Bat activity surveys are continuing through August-October 2021. Baseline and proposed habitats were converted to the UKHab system, and entered into the Defra Metric 2.0, with relevant metadata to calculate BNG for the proposed development.

### 2.4. Bat roost survey

HJA conducted bat Preliminary Roost Assessment (PRA) of buildings and trees identified by Ramboll as requiring further assessment, in February and June 2021. The nocturnal survey recommendations of Ramboll (Molesworth, 2020) were modified to reflect the findings. Nocturnal surveys (dusk emergence, dawn re-entry, totalling 50 surveyor sessions) of 11 buildings and one tree took place in May-June 2021. A PRA of a woodland block in the proposed prison area to the east of the existing boiler house took place in July 2021.

All surveys followed standard guidance (Collins, 2016), with surveyors positioned to observe potential bat emergence and re-entry points on buildings and trees. One dusk survey took the form of a Vantage Point (VP) survey, with surveyors positioned near to B15, to ascertain the direction that emerging bats commuted. The lead bat surveyor was Karl Harrison (CL18 licensed), assisted by Will Steele (CL07 licensed), Emma Sutton, Richard Else, Rachel Whitaker, and Hazel Watson. Surveys were conducted in line with published Covid-19 advice (BCT, 2020; CIEEM, 2020; IUCN, 2020).

### 2.5. Bat activity survey

HJA are conducting monthly bat activity surveys from April to October 2021, using a single transect (two surveyors) and two static detectors deployed for a week each month. The methodology follows standard guidance (Collins, 2016). The lead surveyor is Karl Harrison (CL18-licensed), assisted by Will Steele (CL17 licensed) and other HJA staff. The results from the April, May, June, and July surveys have contributed to this EcIA, but the August-October surveys are yet to be completed. The report will follow during determination.

### 2.6. Water vole survey

Chris Gleed-Owen of CGO conducted the first water vole survey visit on 19-20th April 2021, examining all waterbodies, watercourses, and ditches. The second visit was conducted on 13-14th July 2021. Methodology followed Dean *et al* (2016), searching for water voles, burrows, feeding stations, latrines, and other reliable evidence. At the time of April visit, vegetation was low enough to visually inspect for water vole evidence; in July, vegetation growth was a limitation in some sections of ditch. The report will follow during determination.

In addition, as recommended by the PEA of an additional area within HMP Wymott (Gleed-Owen, 2021a), a camera trap survey was conducted to investigate a suspected population of fossorial water voles within the prison fence. (This is the terrestrial form of the species found in southern Scotland, which may be under-recorded elsewhere). Four motion-activated infrared video cameras were positioned from 10-17th March 2021, in the former assault course within HMP Wymott. Several earth mounds contained numerous burrows around 8-10cm in size. The results were presented in the CGO PEA (Gleed-Owen, 2021a; see Appendix 2).

### 2.7. Barn owl survey

CGO and HJA conducted barn owl surveys in February to July 2021. Daytime walkovers, including internal buildings inspections, were made during PEA and bat PRA surveys in February 2021, and again in a targeted fashion on 21-22nd June and 13-14th July 2021. Incidental dusk and dawn surveys were conducted in March-May 2021 during GCN nocturnal surveys, in May-June 2021 during bat nocturnal surveys, and in April-June 2021 during bat activity transects. Targeted barn owl dusk surveys were conducted on buildings B10 on 21st June and B11 on 13th July 2021. Methodology followed Shawyer (2011), informed and adapted according to findings gathered during PEA and phase 2 surveys. The surveys were led by Chris Gleed-Owen (CGO) and HJA personnel. The report will follow during determination.

### 2.8. Great crested newt, amphibian survey

HJA conducted GCN Habitat Suitability Index (HSI) surveys of ponds on MoJ land in February-March 2021, following standard guidance (ARGUK, 2010). MoJ sought third-party permissions for off-site land access, but this was largely not forthcoming, and HSI assessment was only possible on a few off-site ponds to the southeast of HMP Wymott and the north of HMP Garth.

GCN presence-absence surveys were then conducted on all ponds with HSI scores in the 'average', 'good', or 'excellent' Brady categories (cf. ARGUK, 2010). Following English Nature (2001) survey methodologies, four nocturnal visits using three techniques (typically torch, bottle-trap, egg-search) were conducted at 16 ponds. As per guidance, GCN presence led to population survey (an additional two nocturnal visits) of one pond. The nocturnal surveys were conducted between 16th March to 25th May 2021, in all cases with at least half the visits taking place in the mid-April to mid-May optimal period (cf. English Nature, 2001).

GCN eDNA sampling took place at one on-site pond, four off-site ponds at Prince Albert Angling Society (PAAS) fishing lakes, and three on-site ditches. Samples were processed by Cellmark in Abingdon.

Lack of landowner permission for most of the 51 ponds originally identified within 500m of the development is a significant potential limitation. However, in light of the results obtained, it is not considered to be a significant constraint.

The surveyors were Will Steele (CL08 licensed), Rachel Whitaker (CL08 licensed), Richard Else, Emma Sutton, and Clare Cashon (CL08 licensed). The eDNA sampling at the on-site ditches and off-site PAAS lakes was by Will Steele of HJA (CL08 licensed); the on-site pond was sampled by Chris Gleed-Owen of CGO (CL09 licensed). The report will follow during determination.

### 2.9. Reptile survey

CGO set up the reptile survey on 24th February 2021, deploying 140 artificial refugia in 14 transects of 10, at a spacing of 5m between refugia. Roofing felt mats (50cm x 30cm) were used as artificial refugia, pressed down into rough grass along hedgerows, field boundaries, and other suitable habitat. HJA and CGO conducted seven survey visits between 13th April and 18th May 2021, in suitable weather and times of day. Each visit involved a walkover of the whole site, visually searching for reptiles, and checking all 140 artificial refugia. The surveyors were Rachel Whitaker, Richard Else, Hazel Watson, and Chris Gleed-Owen, all experienced reptile ecologists. Surveys were in line with standard guidance (Froglife, 1999; HGBI, 1998; Natural England, 2011). The report (Gleed-Owen, 2021b) is attached in Appendix 2.

### 2.10. Invasive Non-Native Species survey

Chris Gleed-Owen of CGO conducted walkovers of the whole site on 19-20th April 2021 and 13-14th July 2021, searching for INNS plants. Particular focus was given to ponds and ditches, where the most prevalent INNS plants are normally found. The April visit enabled a detailed inspection of all habitats prior to the spring surge in vegetation. The July visit enabled identification of the annual Himalayan balsam (*Impatiens glandulifera*) at its peak, and species would have identified seasonal species such as Japanese knotweed (*Fallopia japonica*) which regrow each year. The report (Gleed-Owen, 2021c) is appended in Appendix 2.

### 2.11. Impact assessment

In accordance with accepted guidance (CIEEM, 2018), all ecological features within the ZOI (sites, habitats, species) were categorised according to the geographical scale of their importance (international, national, regional, county, local, site-level). This allows impact assessment on all 'ecological receptors' (potentially-impacted features) using a combination of baseline data from desk study, phase 1 and phase 2 surveys, published guidance, other literature, and personal expertise. Potential effects are then described qualitatively and quantitatively in terms of their: magnitude, extent, timing, duration, reversibility, frequency, distance (direct or indirect), and nature (positive or negative).

The project development process has incorporated ecologist expertise throughout the scheme design. The mitigation response has followed the 'mitigation hierarchy', i.e. avoid, minimise, mitigate, compensate, and enhance. Alongside the latter, the principle of BNG has been built into the landscaping design, with the goal of achieving at least 10% BNG, as per MoJ policy for its new prisons.

### 2.12. Biodiversity Net Gain

Biodiversity Net Gain (BNG) calculations were made by CGO in June 2021, in close liaison with Mace and Pick Everard (PEV), using Defra Metric 2.0. The Phase 1 habitat data from the Ramboll and CGO PEAs were combined by CGO using Geographical Information System (GIS) to extract area and length figures. The post-development area and length figures, and treatments were provided by PEV. The Metric is being submitted with planning. A short summary report will be produced during determination. At the time of writing, Metric 3.0 has been released, but as advised by GMEU, Chorley Council will accept Metric 2.0.

### 2.13. Limitations

The bat activity surveys are incomplete. The bat activity report will be completed in late October 2021. The monthly activity surveys (dusk transects, static detector deployment) for August, September, and October have not yet been conducted. Nevertheless, the data gathered so far in April, May, June, and July offer a good insight into the species and numbers of bats present, their commuting and foraging areas, and the likely impacts of the proposed development.

No Breeding Bird Surveys (BBS) or Wintering Bird Surveys (WBS) have been conducted, as they were scoped out by GMEU. The lack of BBS data is not considered a significant limitation, because the potential impacts on Birds of Conservation Concern (BoCC), strictly-protected species, and birds in general (all of which are protected whilst nesting), can be ascertained from habitat mapping and incidental data gathered from other surveys. The site is unlikely to be important for overwintering birds, as the new prison areas is intensively farmed; the new bowling club occupies a small area; and the new boiler house is on built land.

The GCN surveys were largely restricted to ponds within the MoJ ownership boundary. Only three off-site ponds to the southeast of HMP Wymott were subjected to nocturnal presence-absence surveys. The PAAS fishing lakes to the north of HMP Garth were accessed to conduct HSI assessment and take eDNA samples of four ponds, but access was not granted for nocturnal surveys. Nevertheless, as GCN presence across the site is scant, and numbers are low, it is considered that access to other off-site ponds would not yield significant additional data.

## 3. Baseline conditions

### 3.1. Landscape context

The proposed new prison will be on 18.40ha of land to the north of HMP Wymott, a category C prison occupying around 17ha. HMP Garth, a category B prison occupying around 12ha, lies to the west. The majority of the new prison area lies to the west of a minor track called Pump House Lane, but part of it lies to the east, and part is within the existing HMP Wymott prison.

The land north of HMP Wymott is currently used as a sheep farm, stables, bowling club, boiler house, and utility buildings. The part within HMP Wymott is a sports field and disused assault course. There are strips of woodland to the east and southeast, an angling lake to the east (Wymott Angling Club); and farmland to the north.

The proposed new boiler house will be on 0.23ha of built land (hardstanding and amenity grass areas) between the two prisons. The proposed new bowling club will be on 0.63ha of land currently used to farm sheep, to the southwest of HMP Wymott.

The wider landscape is a low-lying coastal plain, comprising a network of floodplains associated with tributaries to the River Ribble. Despite its rural position, the location is essentially urban-fringe, being on the edge of two existing prisons and a housing estate.

The surrounding area is intensively farmed for a mixture of livestock and arable crops, but there are significant areas of woodland and other land uses. A large area of woodland lies to the southwest of the site, extending around the west and north of HMP Garth. There are major urban areas to the northeast (Leyland and Preston), and a network of minor roads, railway lines, villages, hamlets, and farms in all directions.

According to the Defra MAGIC website, soils here are slowly-permeable, seasonally-wet, slightly-acid but base-rich loams and clays. The predominant soil is loam with impeded drainage and moderate natural fertility. Characteristic seminatural habitats are lowland seasonally-wet pastures and woodlands. Modern land uses are mainly arable and grassland, with some woodland. The Natural Character Area is Lancashire and Amounderness Plain.

### 3.2. Designated sites

The Defra MAGIC website shows only one protected site designation within 5km: Longton Brickcroft LNR (Local Nature Reserve) which lies 4.5km north.

No other protected site lies within 5km, but the River Douglas, a tributary of the River Ribble, lies 4.5km west of the site. The Ribble catchment is protected by the following national and international designations: Ribble Estuary SSSI (Site of Special Scientific Interest), Ribble Estuary NNR (National Nature Reserve), Ribble and Alt Estuaries SPA (Special Protection Area), and Ribble and Alt Estuaries Ramsar site. Any development in the Ribble catchment (including tributaries such as the Douglas) should be screened for potential impacts on the integrity of the Ribble's various designations.

A 'local site', the Ulnes Walton BHS (Biological Heritage Site), lies north and west of HMP Garth (map provided by LERN), comprising woodland and the PAAS fishing lakes. This has no statutory protection *per se,* but has *de facto* protection through the local planning process. Three other local sites lie within 2km.

The site is within a Nitrate Vulnerable Zone (NVZ) for surface water (S646 Lostock). This limits the volume of water discharge to drains or soakaways to 20m$^3$ per day.

### 3.3. Habitats, plants

3.3.1. Overview

Phase 1 habitat surveys by Ramboll (Molesworth, 2020) and CGO (Gleed-Owen, 2021a) listed: improved grassland, marshy grassland, buildings, hardstanding, seminatural broadleaved woodland, plantation broadleaved woodland, scattered trees, intact species-rich hedgerow, intact species-poor hedgerow, introduced shrub, ditch, pond, fence, wall.

| Phase 1 habitat type | Total area (ha) |
|---|---|
| Amenity grassland | 2.40 |
| Bare ground | 0.09 |
| Broad-leaved plantation woodland | 2.50 |
| Broad-leaved semi-natural woodland | 0.26 |
| Building | 0.64 |
| Continuous scrub | 0.05 |
| Hardstanding | 1.26 |
| Improved grassland | 10.97 |
| Scattered trees | 0.18 |
| Standing water | 0.05 |
| **Total** | **18.40** |

Table 1 – Phase 1 habitats in the proposed new prison area.

| Phase 1 habitat type | Total area (ha) |
|---|---|
| Hardstanding | 0.05 |
| Improved grassland | 0.58 |
| **Total** | **0.63** |

Table 2 - Phase 1 habitats in proposed bowling club area.

| Phase 1 habitat type | Total area (ha) |
|---|---|
| Amenity grassland | 0.01 |
| Building | 0.02 |
| Hardstanding | 0.16 |
| Improved grassland | 0.04 |
| **Total** | **0.23** |

Table 3 - Phase 1 habitats in proposed boiler house area.

| Phase 1 habitat area | Total area (ha) |
|---|---|
| Amenity grassland | 1.36 |
| Bare ground | 0.40 |
| Broad-leaved plantation woodland | 3.01 |
| Broad-leaved semi-natural woodland | 0.21 |
| Building | 0.61 |
| Hardstanding | 4.03 |
| Improved grassland | 13.12 |
| Marshy grassland | 0.05 |
| Scattered scrub | 0.38 |
| Scattered trees | 0.88 |
| Standing water | 0.22 |
| **Total** | **24.27** |

Table 4 - Phase 1 habitats in wider site area for BNG improvements within the red line boundary.

All of these except marshy grassland is represented within the application red line boundary. Ponds and broadleaved woodland (Broadleaved, Mixed and Yew Woodland, Wet Woodland, Lowland Mixed Deciduous Woodland) are UK Priority Habitats.

The application red line boundary has an area of 43.53ha, of which the proposed development occupies 19.26ha, representing 19% of the 100.68ha MoJ estate at and around HMPs Garth and Wymott. The proposed designs were overlaid onto the Phase 1 mapping using GIS, to enable area/length measurement of habitat types subjected to each treatment: new prison, bowling club, boiler house, rest of red line boundary. See tables 1-4 below. The 'rest of red line boundary' habitats comprise 11.90ha that will be retained, and 12.37ha of habitat creation (ponds, woodland) and enhancement of existing modified grassland. The large area of woodland known as Stanning's Folly, southwest of HMP Garth, and the adjacent area of marshy grassland, are outside the red line boundary.

3.3.2. Amenity grassland

This Phase 1 habitat is represented by seeded and regularly-mown grassland areas around and between the two prisons, and in the existing bowling green. It is dominated by species such as red fescue (*Festuca rubra*) and perennial rye-grass (*Lolium perenne*), with variable cover of forbs such as white clover (*Trifolium repens*). The UKHab conversion is g4 Modified grassland.

3.3.3. Bare ground

Small areas of unvegetated ground on farmland to the south and southwest of HMP Wymott. The UKHab conversion is u1c Artificial unvegetated, unsealed surface.

3.3.4. Broad-leaved plantation woodland

Belts of plantation broadleaved woodland are present in the new prison area, and in retained areas to the east of HMP Wymott and between the prison car parks. These are dominated by a mix of natives and non-natives: white poplar (*Populus alba*), aspen (*Populus tremula*), ash (*Fraxinus excelsior*), grey poplar (*Populus x canescens*), hybrid black poplar (*Populus x canadensis*), grey willow (*Salix cinerea*), crack-willow (*Salix fragilis*), hawthorn (*Crataegus monogyna*), hazel (*Coyrulus avellana*), bird cherry (*Prunus padus*), and elder (*Sambucus nigra*). Around half of this habitat within the red line boundary will be lost to the new prison. The majority of trees appear to be no more than 50 years old. The UKHab conversion is w1g Other woodland; broadleaved.

3.3.5. Broad-leaved semi-natural woodland

Seminatural broadleaved woodland within the red line area is represented by small areas of woodland on the east and south fringes of the site, mostly to be retained. The species composition includes crack-willow, grey willow, hawthorn, elder, and wild cherry (*Prunus avium*). The UKHab conversion is w1g Other woodland; broadleaved.

3.3.6. Building

Within the red line are some buildings which will be lost (B1-9, B12-13, B23 - boiler house, farm offices, barns, stables, bowling clubhouse, utilities buildings, and a building inside HMP Wymott). A cluster of buildings between the two prisons will be retained, as well as barns on farmland to the northeast (B11) and south (B21). The UKHab conversion is u1b Developed land; sealed surface.

3.3.7. Continuous scrub

There are small areas of dense and scattered scrub around the site, dominated by bramble (*Rubus fruticosus* agg.) but also willows, woody herbs such as meadowsweet (*Filipendula ulmaria*). The UKHab conversion is h3h Mixed scrub.

3.3.8. Hardstanding

These are areas of asphalt, concrete, gravel or other sealed surface. The UKHab conversion is u1b Developed land; sealed surface.

3.3.9. Improved grassland

As defined by Phase 1 (JNCC, 2010), this covers the agriculturally-improved grasslands with poor species diversity, dominated by species such as perennial rye-grass, and with significant cover of undesirable 'weeds' such as thistles, docks, and white clover. These areas on site are grazed rotationally by livestock, thus producing a mixture of short and long swards.

3.3.10. Scattered trees

A mixture of native and non-native trees are planted in amenity areas, and occurring naturally, such as ash, willows, poplars, and occasional English oak (*Quercus robur*). The UKHab conversion is w1g Other woodland; broadleaved.

3.3.11. Standing water

Five ponds and several wet ditches are included in the red line boundary. Four ponds are in farmland to the north and south; one pond is in the amenity area between the prisons. The ditch network extends around the whole MoJ ownership, within and outside the red line boundary. Several wet ditches will be lost to the new prison. The UKHAB correspondence is r1a6 Other eutrophic standing waters.

3.3.12. Intact native species-rich hedgerow

Several stretches of intact hedgerow in the farmland comprise a range of native woody species, such as hawthorn, blackthorn, elder, field maple (*Acer campestre*), dogwood (*Cornus sanguinea*), and dog rose (*Rosa canina*). 140m will be lost to the new prison development. UKHab correspondence is h2a Hedgerow (priority habitat).

3.3.13. Native species-poor hedgerow

Some intact hedgerow in the farmland is species-poor, typically dominated by a single species (usually hawthorn). 280m will be lost to the new prison development. UKHab correspondence is h2b Other hedgerows.

3.3.14. Network Expansion Zones

The Defra MAGIC website shows that National Habitat Network 'Network Expansion Zones' on or near the site. These could provide a planning framework for any proposed habitat enhancement, such as pond creation and agricultural reversion.

3.3.15. Notable plant species

Two mature native black poplar (*Populus nigra betulifolia*) are present in a farmland hedgerow to the south of HMP Wymott. They are around 30m in height, with stem diameters around 900mm. This is a UK rare species and Lancashire Key Species.

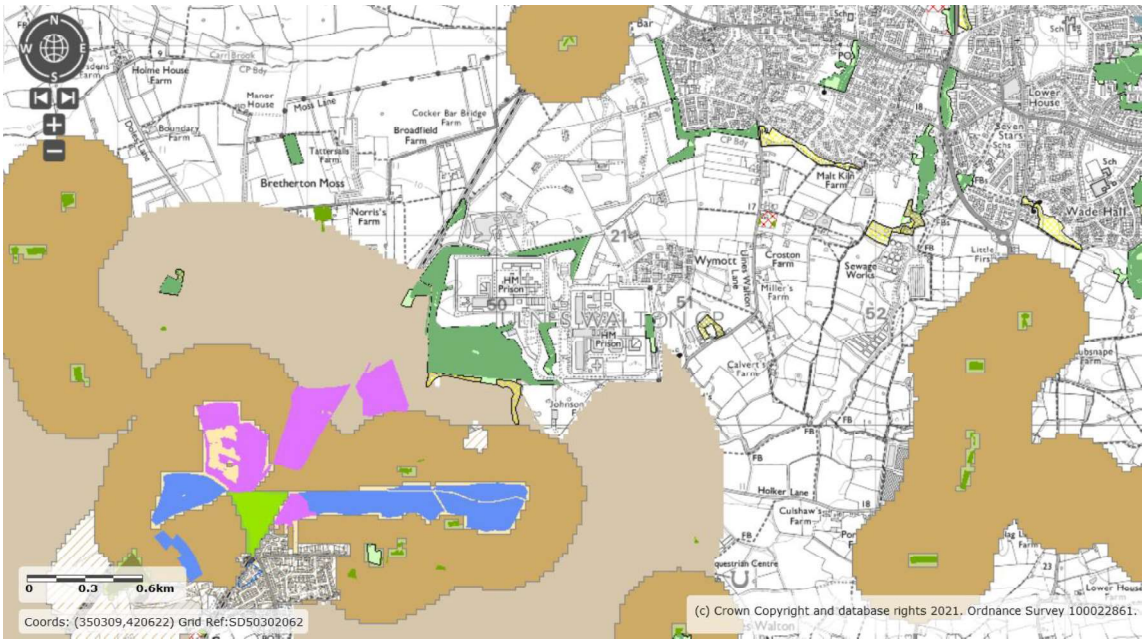

Figure 4 – Defra MAGIC map showing Priority Habitats (dark green = deciduous woodland) and National Habitat Network 'Network Expansion Zone' radii (beige and brown areas) around site.

### 3.4. Bats

3.4.1. Desk study

Natural England has issued 16 European Protected Species (EPS) mitigation licences within 5km. Eight of these were for bats, the nearest being 400m south for common pipistrelle (*Pipistrellus pipistrellus*). The others are for common pipistrelle and/or brown long-eared bat (*Plecotus auritus*), with one also including Brandt's bat (*Myotis brandtii*) 4.3km north.

The LERN search yielded 33 bat records within 2km, comprising common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*), Brandt's bat, brown long-eared bat, and unidentified bats. The records include roosts for both pipistrelle species within 2km.

3.4.2. Roost surveys

27 buildings were subjected to a PRA, of which 11 buildings and one tree have been surveyed nocturnally. Another tree was climbed, and roosts ruled out. Buildings 1-16 are within the ZOI. B17-27 are deemed to be outside the ZOI. B1-9 and B13 will be lost to the development. Bat roosts have been ruled out of all of them by nocturnal surveys and/or PRA. The remaining 17 buildings will be retained, although development will occur close to some, most notably B15.

An area of woodland within the new prison area has been subjected to a PRA. Most of it has low or negligible bat roost potential, but the northwest part had trees with moderate to high potential as determined from ground level. These received a climbed inspection in July 2021 which ruled out the presence of bat roosts. No further bat survey is needed in this woodland.

A large common pipistrelle (*Pipistrellus pipistrellus*) maternity roost is present in B15, an L-shaped single-storey brick building located between the prisons, occupied by HM Probation Service as offices, classrooms, and conference centre. According to Ramboll (Molesworth, 2020), previous surveys in 2009 and 2010 confirmed it as a common pipistrelle maternity roost (although not included in the LERN data). This was updated by three HJA nocturnal surveys (three surveyor positions) and a VP survey (two surveyor positions) in May and June 2021, which confirmed a maternity colony of at least 200 individuals in roosts around the soffits.

On the first survey (10/05/2021, dusk), 128 common pipistrelles emerged from four entry points at roost one (R1) on the western gable. Five emerged from roost two (R2) at the northern gable. One emerged from roost three (R3) at the eastern gable. A total of 134 bats were seen emerging. On the second survey (26/05/2021, dawn), 27 common pipistrelles re-entered the same three roosts. The third survey (09/06/2021, dusk) saw 36 common pipistrelles emerge.

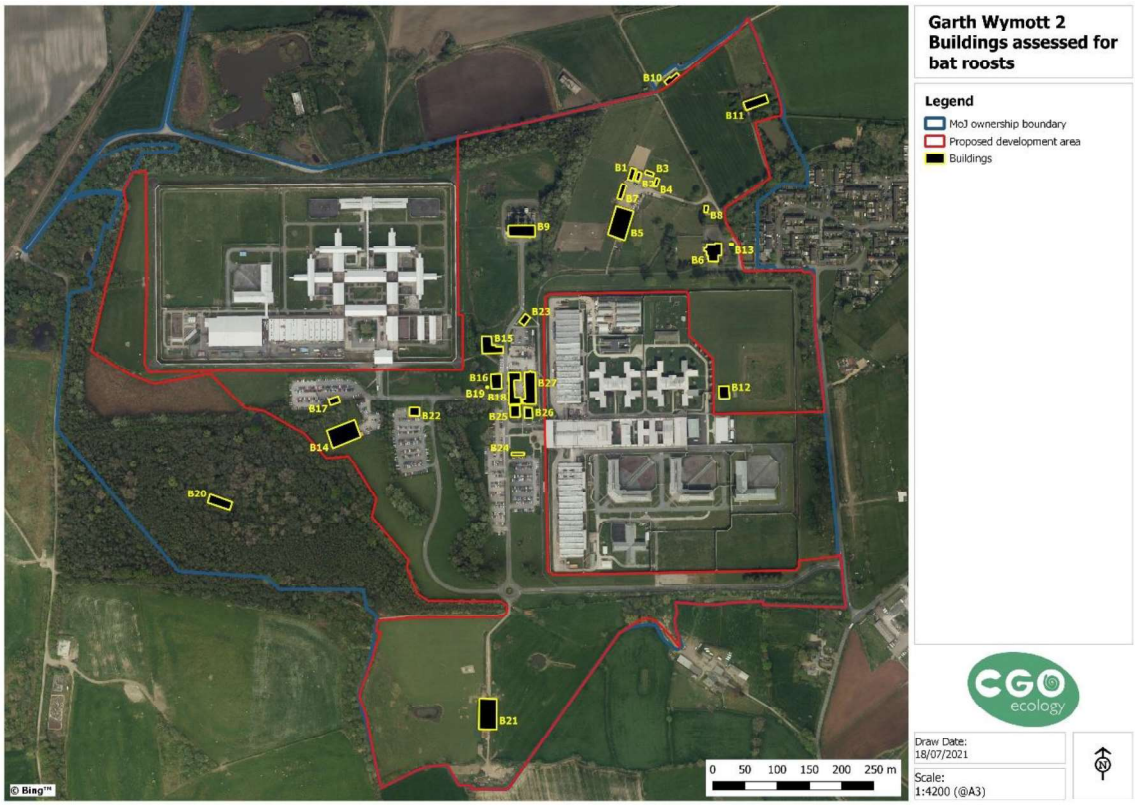


Figure 5 – Buildings subjected to a bat PRA survey in 2021.

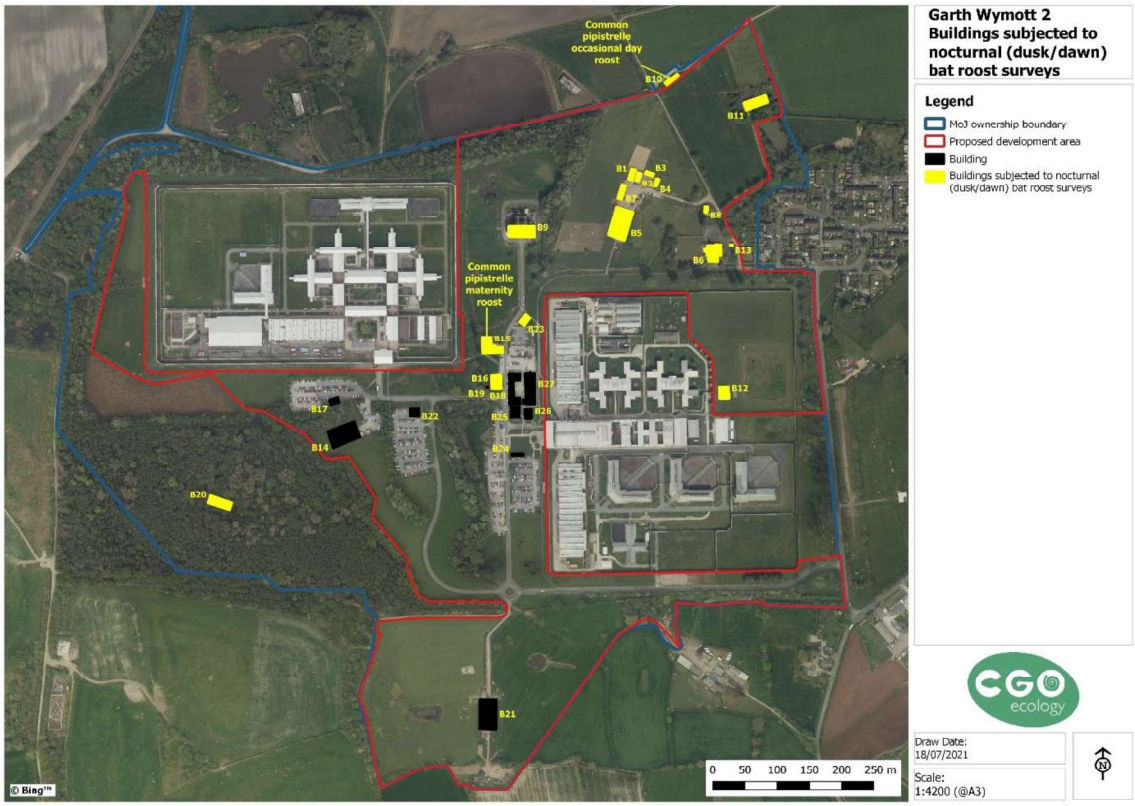


Figure 6 – Buildings subjected to nocturnal surveys (dusk emergence, dawn re-entry) for bats in 2021.

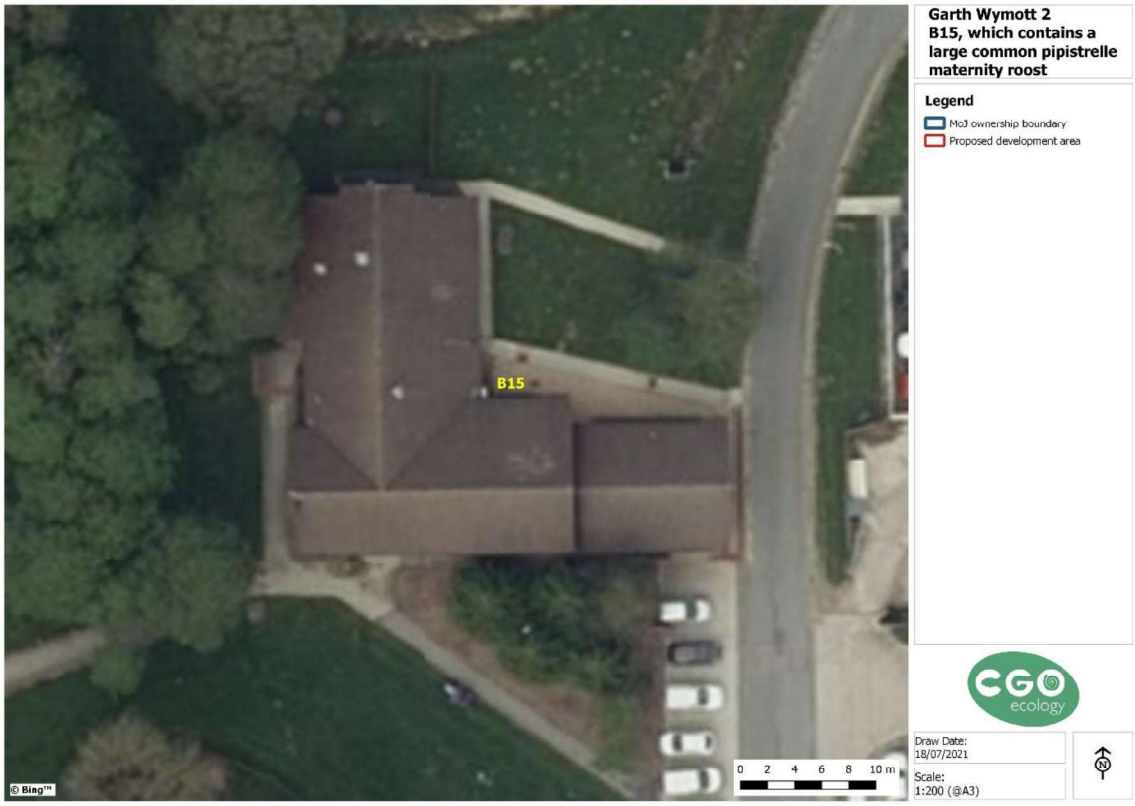


Figure 7 – Building 15 (common pipistrelle maternity roost). The new boiler house will be located to the east of B15.

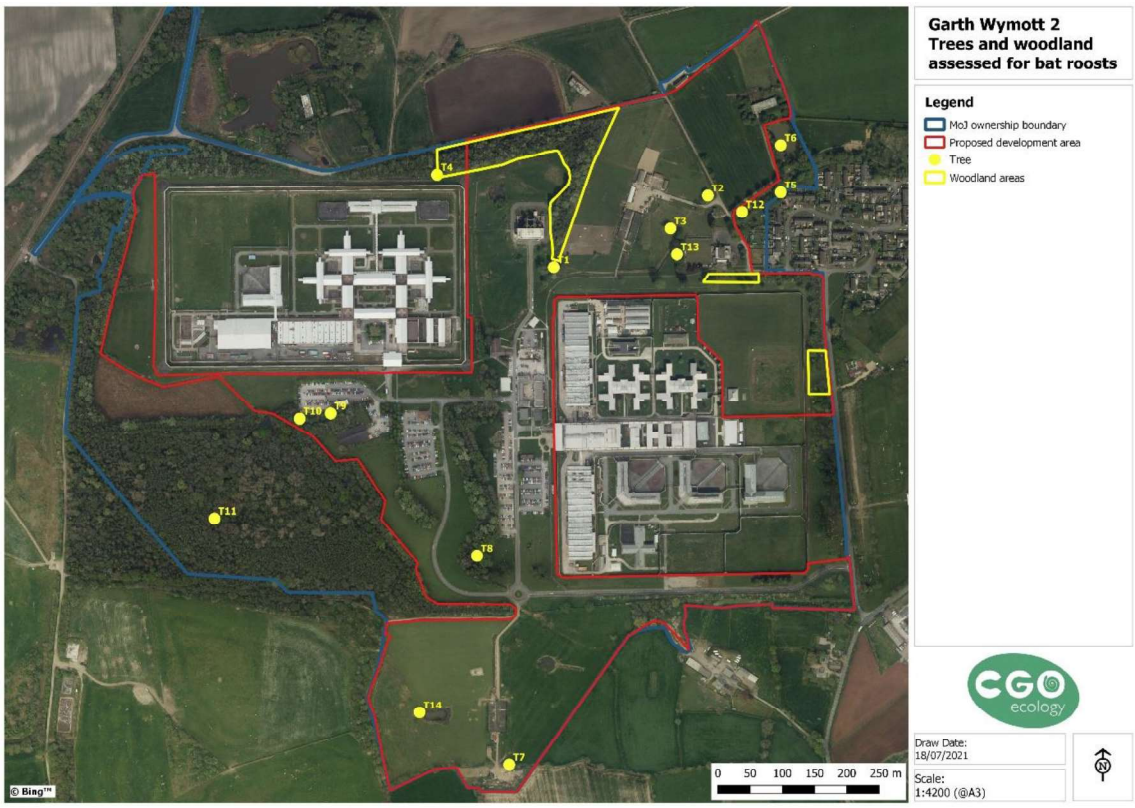


Figure 8 – Woodland and individual trees subjected to a bat PRA survey in 2021.

A VP survey was conducted (22/06/2021, dusk), with surveyors positioned north and south of B15, to ascertain the commuting direction of emerging bats. The north position recorded about 180 common pipistrelles emerging from the north gable roost on B15, almost all flying round the west side of the building and commuting south. The south position recorded around 200 common pipistrelles heading south, nearly all of which are assumed to have emerged from the three roosts in B15. In total, it is estimated that the two surveyors saw a collective 230 bats commuting south. This is relatively large for common pipistrelle maternity roosts, which have a median size of 76 (Collins, 2016), and is likely to be one of the largest in the district.

An informal fifth survey (13/07/2021, dusk) observed at least 40 bats emerge, including some that appeared to be young bats practising flight.

B15 will be retained. However, a key consideration is whether the new prison development to the north, or the new boiler house immediately to the east, will affect the roost's integrity and/or bats' access to foraging areas and commuting routes.

A small common pipistrelle roost is present in B10. A single common pipistrelle emerged from the west gable soffit on the first of two nocturnal surveys (18/05/2021, dusk). A second survey (08/06/2021, dawn) did not record a re-entry, and a third survey (15/06/2021, dusk) did not record a bat emergence. Hence, it is assumed that this is an occasional day roost used by a single male bat.

No emergences or re-entries were recorded at nine other buildings subjected to nocturnal surveys (B1-6, B8-9, B13), including all buildings that will be lost to the new prison development. The report is included in Appendix 2 (Harrison & Gleed-Owen, 2021).

#### 3.4.3. Activity surveys

Monthly activity surveys are taking place between April-October 2021, involving a walked dusk transect (two surveyors), and deployment of two static detectors for one week each month. The transect walk encompasses the whole site. The results from April, May, June, and July recorded moderate to high common pipistrelle activity, with occasional noctule (*Nyctalus noctula*), and an unidentified *Myotis* species. The activity surveys for August-October will follow the same methodology, and are not anticipated to yield significantly different results. A report will be produced during determination (Harrison & Gleed-Owen, in prep).

### 3.5. Water vole

Walkover of all ponds and ditches across the site on 19-20th April and 13-14th July 2020 found no evidence of current water vole presence. A ditch that runs along the north edge of the new prison site contains possible defunct water vole burrows, which were initially observed on 2nd February 2021, exposed by recent ditch-cleaning operation. These inadvertently damaged/destroyed and exposed the burrows. It is not known whether these burrows were active at the time of the ditch works in winter 2020/2021. The camera trap survey within HMP Wymott did not record any fossorial water voles. In the absence of current evidence of water vole occupation, it can be concluded that water voles are absent from the red line area. A report will be submitted during determination (Gleed-Owen, in prep).

### 3.6. Other mammals

A herd of fallow deer (*Dama dama*) resides in the woodland and seminatural habitats around the site. They have a very pale colouration. They tend to avoid amenity areas with human activity, at least during the daytime. Any loss of woodland connectivity is likely to affect them.

A colony of brown rats (*Rattus norvegicus*) is present within the former assault course at HMP Wymott (Gleed-Owen, 2021a).

Water shrew (*Neomys fodiens*) is present in at least two ponds (GCN bottle-trapping ceased at these ponds as a result). This is a Lancashire Key Species.

Hedgehog (*Erinaceus europaeus*) was recorded between the prisons during a bat nocturnal survey (20/05/2021, SD 50674 20786), and is likely to occur across the site. Hedgehog is on Schedule 41 of the NERC Act 2006, and a Lancashire Key Species.

Mole (*Talpa europea*) is present across the site. Field vole (*Microtus agrestis*) has been identified from a barn owl pellet. Other small and large mammals are likely to be present.

Notably, no evidence of badgers has been identified on any of the PEA or phase 2 surveys, and it can be concluded that badgers are absent from the site. Fox (*Vulpes vulpes*) is also notably absent. Otter (*Lutra lutra*) can be ruled out too, as if present it would have been detected during the water vole and GCN surveys.

### 3.7. Barn owl

Building inspections and walkovers were undertaken for barn owl roosts on 2nd February, 24th February, March, 19-20th June, and 13-14th July 2021. Dusk surveys were conducted on 19th June and 13th July. Bat and GCN surveys between March-June also yielded incidental records of barn owl emerging from roosts, and foraging.

Barn owls are confirmed to roost in B10 and B11. An artificial nestbox is present in B11, which was active in spring 2021, and is the main roost. The dusk survey on 13th July 2021 showed that barn owls emerging from B11 forage mainly on the farmland to the north of the red line (Fisher land), and to a lesser extent in the new prison area. During a half-hour period, it returned to B11 with four small mammal prey items.

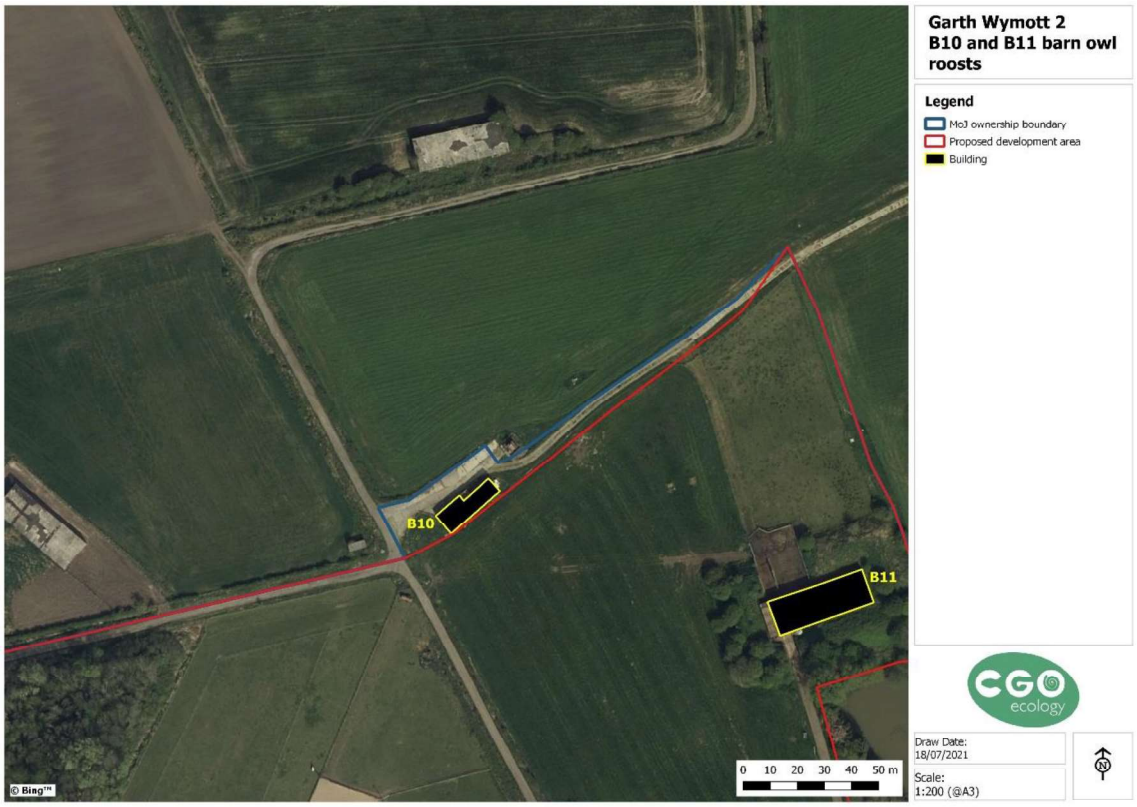


Figure 9 – Location of B10 and B11 containing barn owl roosts. B11 also contains a barn owl nest site in a nestbox.

Barn owls forage across the site, and on off-site farmland to the north. At least three individuals were seen in spring 2021, including a probable recent fledgling, probably raised in B11. Some of the foraging habitat currently used by barn owls will be lost to the new prison development. If the nestbox is moved from B11 to B10, it will present sufficient roosting and nesting habitat for the current residents. Their foraging territory will be reduced, but there is sufficient alternative habitat in the extensive farmland to the north and east to negate the impacts. The report will be submitted during determination (Gleed-Owen, in prep).

B10 will be retained, but it is close to the proposed development, and could be impacted without mitigation. Barn owls are protected by Schedule 1 of the WCA 1981, and are a Lancashire Key Species.

### 3.8. Other birds

3.8.1. Overview

A range of common birds forage and/or nest on site, including species on the Birds of Conservation Concern (BoCC) Red List and Amber List (Eaton *et al*, 2015). No BBS or WBS have been undertaken; therefore, all bird records obtained in 2021 are incidental (except for targeted barn owl surveys).

3.8.2. Strictly-protected species

A hobby (*Falco subbuteo*) was recorded over fishing lakes north of Garth. This is protected on Schedule 1 of the Wildlife and Countryside Act 1981, as amended (WCA 1981).

3.8.3. Red List species

BoCC Red List species recorded are: cuckoo (*Cuculus canorus*), grey wagtail (*Motacilla cinerea*), herring gull (*Larus argentatus*), linnet (*Carduelis cannabina*), song thrush (*Turdus philomelos*), tree sparrow (*Passer montanus*). All of these are confirmed breeders or likely to breed on site, including within the proposed development areas. The woodland area that will be lost to the new prison could support nesting tree sparrow and other BoCC Red List species.

3.8.4. Amber List species

BoCC Amber List species recorded are: great black-backed gull (*Larus marinus*), mallard (*Anas platyrhynchos*), oystercatcher (*Haematopus ostralegus*), reed bunting (*Emberiza schoeniclus*), stock dove (*Columba oenas*), tawny owl (*Strix aluco*). All are confirmed breeders or likely to breed on site, including within the proposed development areas. Oystercatcher and great black-backed gull appear to breed within the existing prisons.

It is possible that some bird species will overwinter on site. During the PEA walkover (24th February 2021), a flock of c.20 herring gull, c.20 oystercatcher, and c.30 wood pigeon (*Columba palumbus*) were circling noisily above HMP Wymott. However, given the intensive land use of the farm to the north of HMP Wymott, significant numbers are unlikely. The fields to the south of HMP Wymott see less human activity, and are more likely to attract overwintering birds. This includes the area of the proposed new bowling club, but again, numbers are not likely to be significant..

3.8.5. Green List/common species

Many BoCC Green List bird species are also present on site, and could breed and/or forage within the proposed development areas. Common species with only nest protection under the WCA 1981 recorded in 2021 are: blackbird (*Turdus merula*), blue tit (*Cyanistes caerulea*), carrion crow (*Corvus corone*), coal tit (*Periparus ater*), collared dove (*Streptopelia decaocto*), feral pigeon (*Columba livia domestica*), grey heron (*Ardea cinerea*), lesser whitethroat (*Sylvia curruca*), robin (*Erithacus rubecula*), and wood pigeon. An INNS, Canada goose (*Branta canadensis*), also nests on site.

Given the extent of similar habitats in the wider landscape, the species present on site are likely to be the same as those in the surrounding areas. Many birds are Lancashire Key Species, which will be a material planning consideration.

### 3.9. Great crested newt

Following HSI assessment and triage of all ponds and ditches (ARGUK, 2010), and four nocturnal presence-absence surveys of all suitable waterbodies in line standard guidelines (English Nature, 2001), no GCN were detected in the development areas. However, GCN is present in one pond within 500m of the development, for which two additional nocturnal surveys were conducted to identify population class.

A small population of GCN is present in pond 39 (P39), within the red line, about 90m south of the proposed bowling club. The maximum count was 12 GCN on 17/05/2021. GCN migrating in their terrestrial phase to hibernation habitat (usually woodland) could travel north across 140m of open grassland to reach woodland to the north. Woodland to the west is nearer (70m), though, and a more likely route. The lack of nearby woodland or hedgerows may be a negative influence on this population at present. On balance, it is possible that very low numbers of GCN (fewer than five) could be impacted by the bowling club development.

GCN presence has also been identified by eDNA survey in pond 19, about 290m south of the proposed boiler house, and 340m south of the new prison development. P19 is part of a ditch in the sinuous woodland belt between the prison car parks. Four nocturnal surveys failed to identify GCN presence in P19, and the Cellmark assay detected GCN eDNA in only four out of 12 replicates. This suggests that only a few GCN are present in this ditch. This constitutes a low risk of one or two GCN reaching the boiler house and new prison development areas.

GCN presence was also detected by eDNA in the PAAS fishing ponds north of HMP Garth (part of the Ulnes Walton BHS local site). Four ponds were deemed GCN-worthy by HSI (P8-10, P42), of which two (P8, P42) proved positive for GCN. The Cellmark analyses only found GCN DNA in two out of 12 replicates for these ponds, however, which suggests a low population density. Pond 42 is around 210m west of the new prison, but given the extent of intervening woodland, is likely to be outside the ZOI of the prison development. Furthermore, no GCN was detected elsewhere in the northwest part of the new prison area, i.e. pond 34 (four nocturnal surveys) and the ditches (Cellmark eDNA). On balance, there is a low risk that a few GCN (fewer than five) could be affected by woodland clearance for the new prison.

Natural England has issued eight EPS mitigation licences within 5km for GCN, the nearest being 1.2km east. MAGIC also shows nine GCN occurrence records from surveys. The nearest is 1.4km east. Another is 1.9km north. The others are 3-5km away. GCN is strictly protected by the Habitats Regulations 2019 and Schedule 5 of the WCA 1981, and is a Lancashire Key Species.

It is likely that larger GCN populations exist in surrounding areas. This provides an opportunity for synergistic enhancement on site. A report will be submitted during determination (Gleed-Owen, in prep).

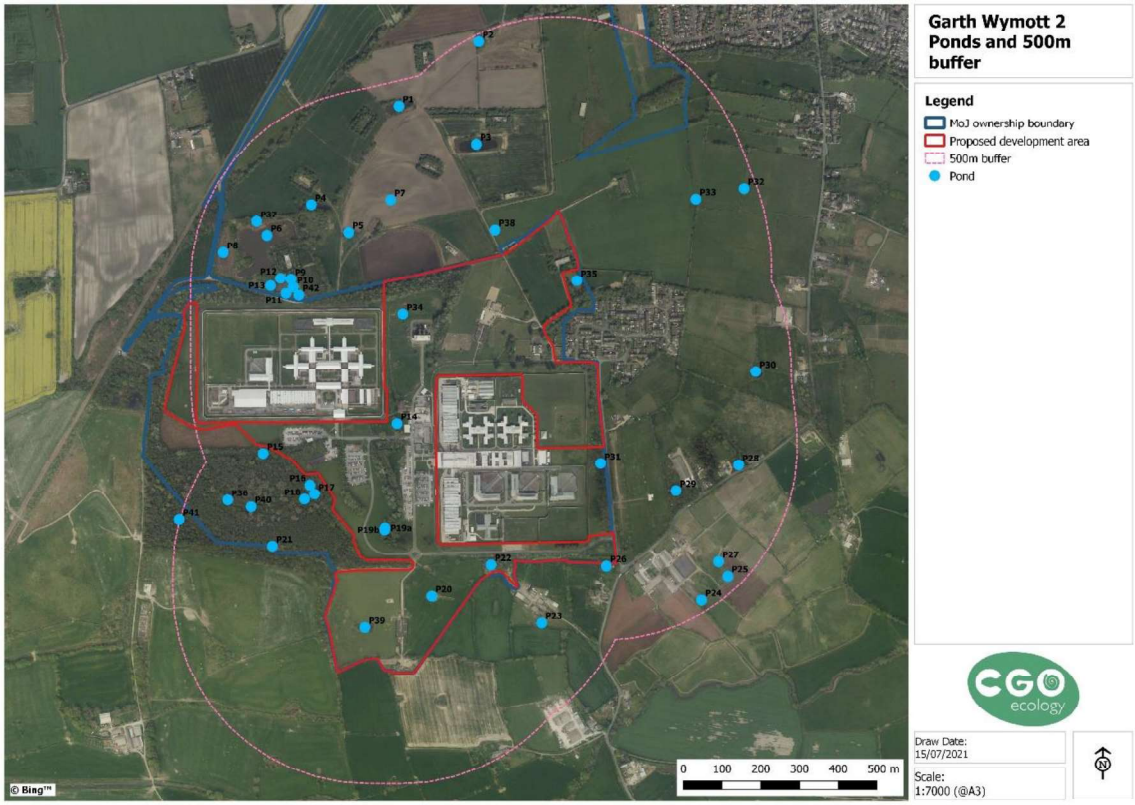


Figure 10 – Ponds within 500m of development activity (new prison, boiler house, bowling club).

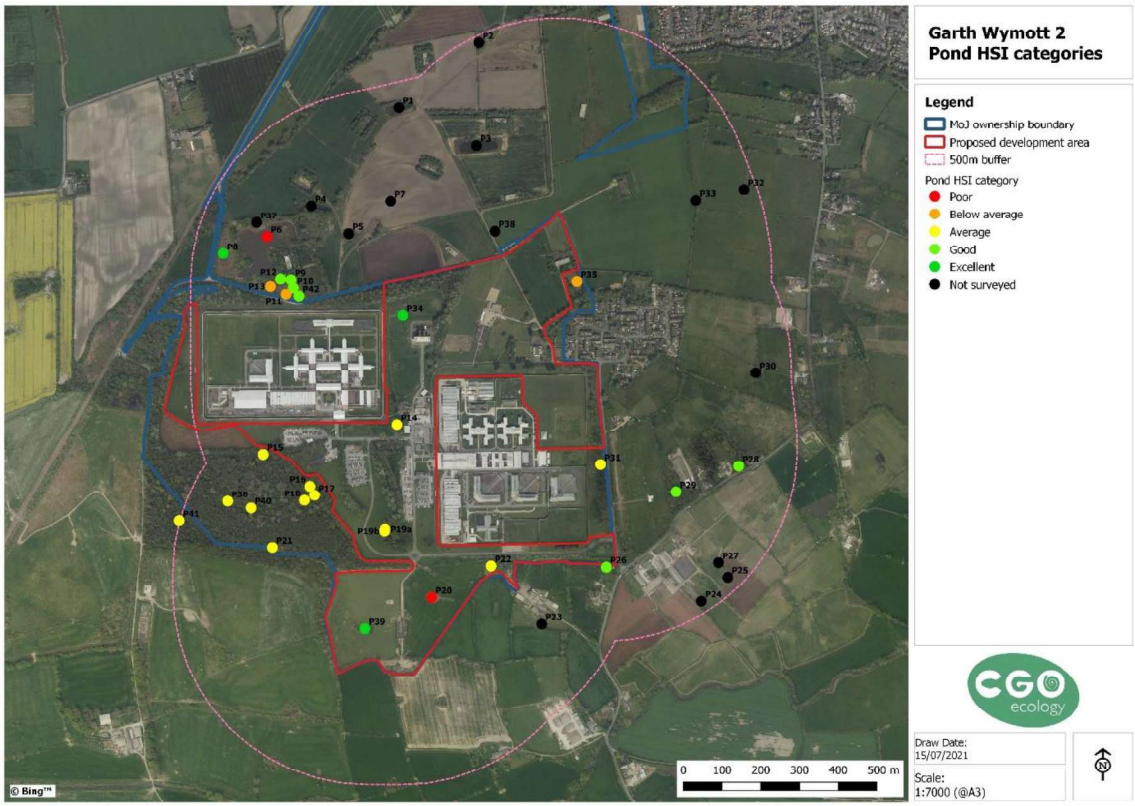


Figure 11 – HSI results for ponds within 500m of development activity (new prison, boiler house, bowling club).

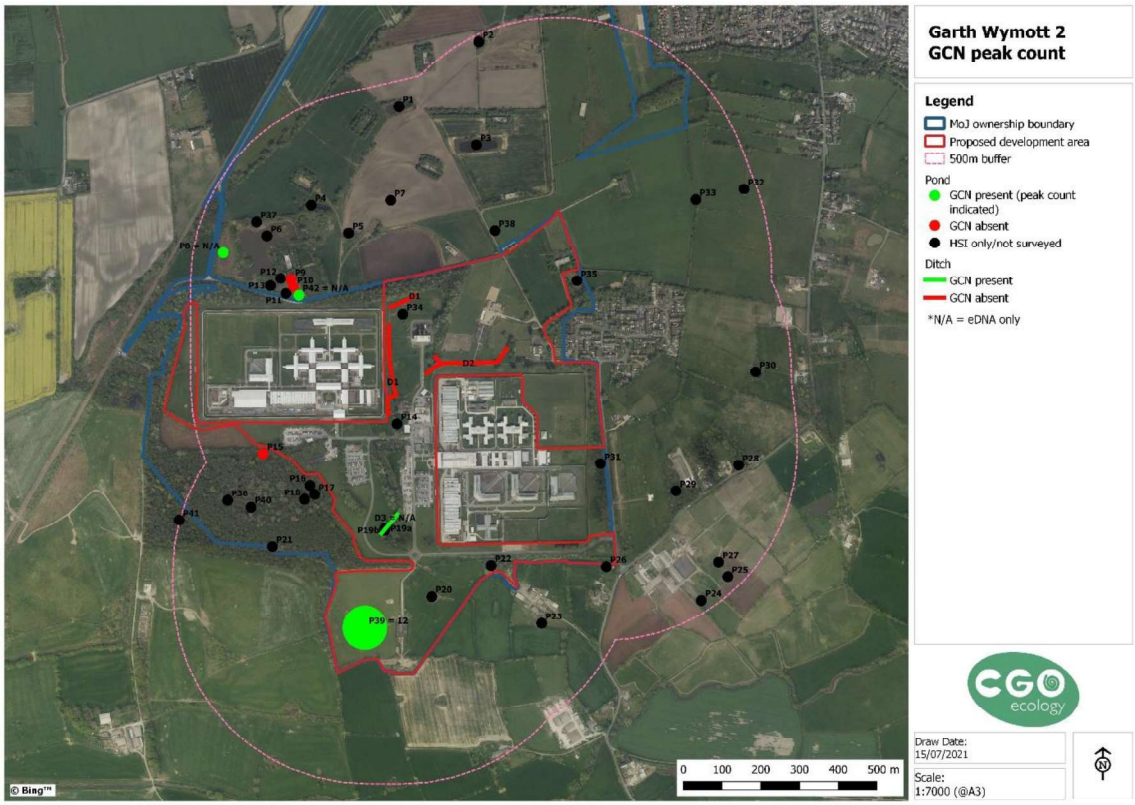


Figure 12 – GCN presence-absence and peak counts derived from nocturnal surveys and eDNA.

### 3.10. Other amphibians

Common toad (*Bufo bufo*), common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*) were regularly encountered during the GCN nocturnal surveys, and are widespread throughout the site. Common toad and common frog were also encountered during the reptile surveys and other daytime walkovers. Common toad is listed on Schedule 41 of the NERC Act 2006. All the widespread amphibians are Lancashire Key Species.

### 3.11. Reptiles

No reptiles were encountered on any visit, and they can be assumed to be absent from the site. No reptile data was returned in the LERN search. The absence of reptiles probably reflects the low-lying, flat, seasonally-wet nature of the landscape here, with few dry hibernation sites (Gleed-Owen, 2021b – see Appendix 2).

### 3.12. Fish

Stickleback (*Gasterosteus aculeatus*) and unidentified fish are present in several ponds across the site, as identified during GCN and other surveys. Sticklebacks may be a significant contributor to the scant presence of GCN across the site, as GCN actively avoids ponds with sticklebacks and other fish. The Wymott Angling Club pond (P35) at the northeast edge of the site is regularly fished, and reputedly stocked with barbel (*Barbus barbus*), bream (*Abramis brama* agg), carp (*Cyprinus carpio*), F1 hybrid carp, perch (*Perca fluviatilis*), roach (*Rutilus rutilus*), rudd (*Scardinius erythrophthalmus*), and tench (*Tinca tinca*).

European eel (*Anguilla anguilla*) is also sometimes caught there (presumably occurring naturally, having crossed land and/or ditch networks). European eel is Listed as Critically Endangered on the International Union for Conservation of Nature (IUCN) Red List. It is also a Lancashire Key Species.

No fish are likely to be resident in the wet ditches on site, as they are too shallow, intermittent, and transitory. The off-site ponds north of HMP Garth, owned/managed by PAAS, are likely to be well-stocked (although two small shallow ones have GCN, and fish are unlikely in those). The PAAS ponds are part of the Ulnes Walton BHS local site.

### 3.13. Invertebrates

A range of common insects and invertebrates is present. Water scorpion (*Nepa cinerea*) and dragonflies (Odonata) were noted during GCN surveys. Several molluscs, butterflies, and other insects were observed during other surveys. A targeted survey has not been conducted. A range of beetles, butterflies, moths, and other invertebrates are on the Lancashire Key Species list.

### 3.14. INNS

The site is largely INNS-free, but a localised infestation of Himalayan balsam (*Impatiens glandulifera*) is present in the ditches on both sides of the east-west track along the north edge of the site. Himalayan balsam is a very problematic WCA 1981 Schedule 9 species (illegal to plant or allow to grow in the wild). This infestation was not evident during the INNS survey in April 2021, but probably germinated around that time, and arose from seeds accidentally imported by the excavator used to clean the ditches in winter 2020/2021. With careless biosecurity, it can quickly infest a whole site.

By 20th June 2021, all ditches on site were thickly vegetated, but the area of Himalayan balsam was identified during a barn owl survey. Several small stands are present within the MoJ red line boundary, in the tree-line along the south side of the northern boundary track. These will be affected by the new prison development. Most of the infestation is outside the red line boundary and outside MoJ land, on Fisher land to the north of the site. The stands occupy the ditch for around 50m, with several isolated plants further west. It is also visible around a brick barn on Fisher land immediately north of the ditch.

Given that the site is largely free of INNS, the eradication of these stands of Himalayan balsam is achievable and imperative. This must be a priority, before it spreads any further. A programme of Himalayan balsam removal must begin before any woodland clearance or other enabling works for the development. Any disturbance activities could spread it further. Himalayan balsam is a fast-growing annual that spreads by seed. It is best eradicated by hand-pulling, carried out before flowering occurs, over three consecutive years.

Four Japanese rose (*Rosa rugosa*) bushes are present in a species-rich hedgerow in farmland within the red line to the south of HMP Wymott. This is also a Schedule 9 species. Notably, this is the same section of hedgerow that contains two mature native black poplar trees. They should be removed before they spread further.

Two stands of montbretia (*Crocosmia x crocosmiiflora*) and a small stand of giant rhubarb (*Gunnera tinctoria*) are present in a communal grassed area on Pump House Lane, east of the bowling club. Both are Schedule 9 species. This area will be lost to the new prison development.

Grey squirrel (*Sciurus carolinensis*) is likely to be present throughout the parkland and woodland areas on site. Canada goose is also present.

A Biosecurity Plan must be in place to ensure that all contractors, suppliers, vehicles, boots, clothing, and other potential INNS vectors are INNS-free. A check-clean-dry policy must be in place for any work affecting any wet habitats. Identification posters for key INNS plants must be prominently posted, and toolbox talks must be given to all site visitors.

The MoJ has confirmed that an Eradication Plan for the Himalayan balsam infestation and other Schedule 9 species will commence in September/October 2021. This will continue in summers 2022-2024 (pulling of Himalayan balsam prior to seeding). INNS plants must be removed and transported by a registered carrier to a controlled waste site. This must take place before any enabling works occur in the infested area, that could cause further spread.

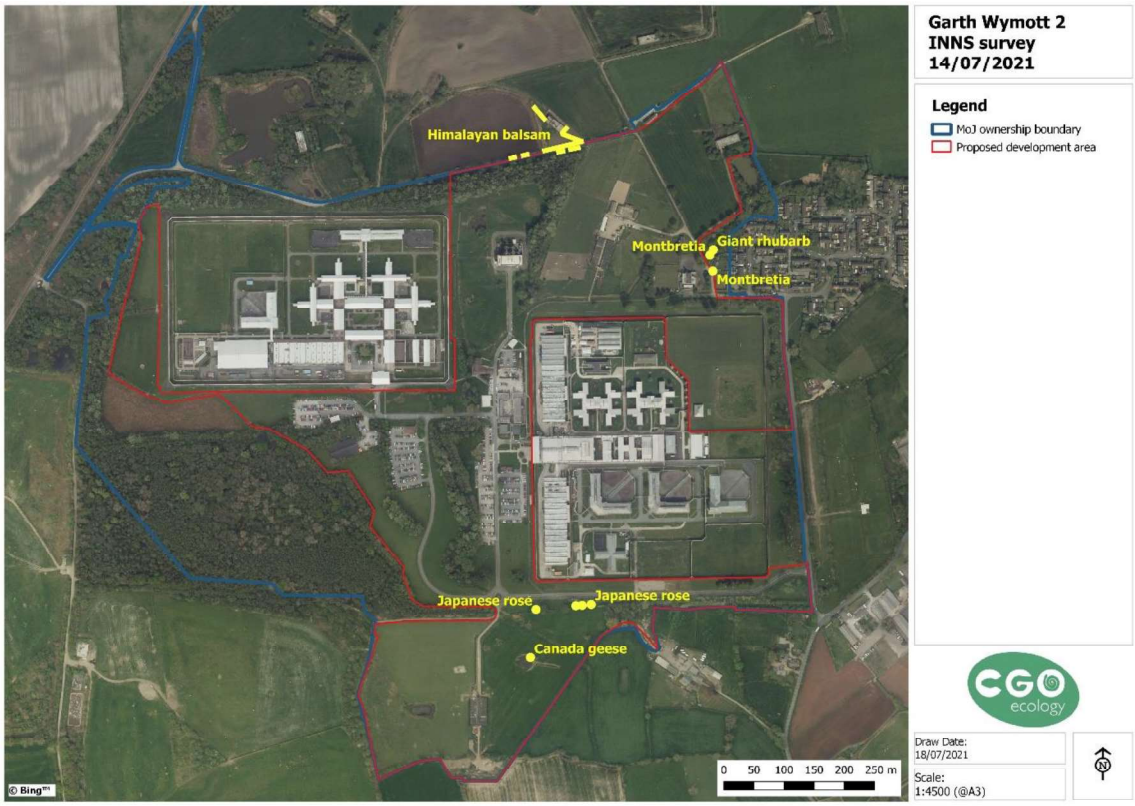

Figure 13 – INNS recorded within the red line boundary.

## 4. Impact assessment and mitigation measures

### 4.1. Overview

| Ecological feature | Importance |
|---|---|
| Designated sites | International, national, local |
| Habitats | Site |
| Bats | Local |
| Other mammals | Site |
| Barn owl | Site |
| Other birds | Site |
| Great crested newt | Site |
| Other amphibians | Site |
| Fish | Site |
| Invertebrates | Site |

Table 5 – Importance of ecological features.

Mitigation has been embedded into the scheme from its beginning. The instruction of ecological surveys was sufficiently early to allow baseline data-gathering, and incorporation of the ecological evidence into the design process. The scheme was designed to minimise the amount of woodland lost to the north and east of the new prison. There is no other location within the MoJ's Garth/Wymott estate with sufficient space for the new prison. The boiler house location was also selected as being the option with the least impact on woodland. The alternative option would have involved loss of some of the woodland belt between the existing prison car parks.

Habitat compensation has also been embedded into the scheme's design, in order to meet the BNG target. Species mitigation and compensation generally does not affect the design.

A Construction Environmental Management Plan (CEMP) will be in place throughout the development. A Habitat Management Plan will be in place for 30 years for all retained, created, and enhanced habitats.

| Ecological features | Importance | Potential impacts | Mitigation |
|---|---|---|---|
| Designated sites | International, national, local | None. No national or international sites within 5km. No direct impacts on nearby 'local sites' during construction or operation. | HRA screening for Ribble sites. |
| Habitats | Site | Major. Construction loss of seminatural woodland, hedges, ditches, pond | Woodland, pond, and hedgerow creation. Grassland enhancement. BNG 20% area, 10% hedgerows. |
| Bats | Local | Moderate. Construction and operational disturbance, loss of commuting/foraging routes, light pollution. | Time construction to avoid active season. No new lighting of areas known to be commuting routes and foraging habitat. New batboxes to provide alternative roosts. Further survey of woodland and activity needed. |
| Other mammals | Site | Moderate. Construction killing, injury, loss and fragmentation of habitat. | Hedgehog checks during enabling works. 13cm passes beneath new fences/walls. Secure fencing to prevent deer entry to construction sites. Humane methods to dispense pest mammals. |
| Barn owl | Site | Major. Construction loss of nesting site, roosts, foraging habitat. | Move nestbox from B11 to B10. New nestbox in B21. Grassland enhancement providing net gain in nesting and foraging habitat, enabling an additional territory to the south of the site. |
| Other birds | Site | Major. Construction loss of nesting sites and foraging habitat. | Enabling works to avoid March-August nesting season. Compensatory nestboxes. New woodland, nestboxes, and other habitat provisions will provide BNG for a range of birds. |
| Great crested newt | Site | Minor. Construction killing and terrestrial habitat loss for a few newts. | DLL scheme to mitigate impacts. Significant net gain of breeding and terrestrial habitat through pond creation and grassland enhancement. |
| Other amphibians | Site | Minor. Construction killing, loss of breeding and terrestrial habitat. | Significant net gain of breeding and terrestrial habitat through pond creation and grassland enhancement. |
| Fish | Site | Minor. Construction potential killing of eels. Loss of ditches reducing aquatic habitat continuity. | None |
| Invertebrates | Site | Major. Construction loss of habitat | No direct mitigation. Compensation and enhancement through habitat creation and improvements on wider site, and installation of 20 bee-bricks in new builds, and new ponds. |
| INNS | Site | Moderate. Construction and operational accidental infestation, continued spread. | Biosecurity Plan in place. Eradication programme for Himalayan balsam prior to works. |

Table 6 – Ecological impacts and mitigation.

### 4.2. Designated sites

4.2.1. Potential impacts

No direct or indirect local construction or operational impacts. Potential minor operational impact on distant Ribble national/international sites, via River Douglas tributary 4.5km away.

4.2.2. Mitigation measures

Undertake shadow HRA screening for distant impacts on Ribble sites during determination.

4.2.3. Compensation

None.

### 4.3. Habitats

4.3.1. Potential impacts

All of the significant impacts on habitats will be during the construction phase. There are not likely to be any negative effects on retained habitats during the operational phase. The development will cause direct permanent loss of 11.38ha of improved grassland, 2.77ha of broadleaved woodland (plantation and seminatural), 2.11ha of buildings and hardstanding, and lesser areas of other habitats.

4.3.2. Mitigation measures

Follow the mitigation hierarchy, any loss of seminatural habitats must be fully compensated by replacement planting on-site, and/or off-site offsetting. Following EcIA principles, all important features must be identified, and the potential impacts on them must be understood. The proposed mitigation and compensation must be appropriate, and secured by effective means. The geographical scale of importance and impacts must be clear. The likely residual impacts must be clearly stated, and the potential cumulative impacts when considering this development alongside others in the area.

Loss of habitats will be compensated by on-site creation and enhancement, achieving 20% BNG for habitats, and 10% BNG for hedgerows. New broadleaved woodland planting will significantly increase connectivity of woodland around the site perimeter. Six new ponds to the south and west will offset the loss of a pond and ditches. Hedgerow loss will be compensated, leading to a net gain. Loss of poor-quality pasture will be compensated by enhancement (seeding) of retained pasture to species-rich neutral grassland.

The CEMP will minimise impacts on retained habitats. The HMP will ensure favourable management of the retained, enhanced, and created habitats for a 30-year period.

4.3.3. Compensation

Inevitably the development sites will be less green than they are now, and BNG habitat trading complicates the concept of habitat mitigation, compensation, and enhancement. Landscaping associated with the new prison (to be agreed through planning) will mitigate the loss of some habitats, including loss of a pond (0.05ha) replaced by a new prison pond (0.08ha). It will also mitigate the loss of some of the broadleaved woodland, through planting of new woodland. New broadleaved woodland will be created by planting of 1.51ha of trees along the northeast and southwest ends of the site.

New hedgerow will be created to the south of the site, to fully offset losses. The new woodland and hedgerow will greatly increase habitat connectivity between existing woodland areas, ponds, hedgerows, and other seminatural habitats.

Nevertheless, to fully compensate the permanent loss of woodland, hedgerow, additional habitat creation or enhancement is required within the red line boundary. To assist this, an extensive programme of agricultural reversion will take place. 6.78ha of existing poor-quality improved grassland (modified grassland) will be enhanced to 'other neutral grassland' UKHab category. This will be achieved by native species-rich grass and herb seeding, and removal of grazing. Then once established, a new less-intense grazing regime will be put in place.

Six new ponds are proposed in the wider habitat improvement area of the red line boundary, but for clarity, these will be treated as enhancements. (It is difficult to differentiate between compensation and enhancement measures where BNG habitat trading blurs the lines between the two; and difficult to link measures to impacts when there are incomparabilities involved).

### 4.4. Bats

4.4.1. Potential impacts

Construction of the boiler house close to the B15 common pipistrelle maternity roost could have temporary and permanent disturbance impacts if unmitigated. There could also be operational impacts on roosting, commuting, and foraging bats, due to increased noise and lighting.

Construction activities for the new prison to north of B15 is likely to have a low impact on the maternity roost's functionality, as nearly all the bats commute south rather than north. Increased lighting and noise could affect it negatively during operation though.

A small common pipistrelle roost in B10 could be impacted temporarily by noise and lighting during construction, and by lighting during operation.

The other affected buildings, trees, and woodland belt contain no roosts. The monthly activity surveys are also incomplete, but data so far show that all the woodland edges to the southwest of the site are most used by common pipistrelle as commuting routes and foraging areas.

4.4.2. Mitigation measures

Works must seek to avoid sensitive times of year for bat activity, especially the B15 roost. Construction of the boiler house and adjacent part of the new prison must avoid the May-August period when 200 bats and their young are present in B15.

There must be constraints on new external lighting for the boiler house and adjacent parts of the new prison, and currently-dark edges of the new prison development. B15 must not receive significant net increase in lighting and noise that could affect the integrity of the roost.

The final results of the monthly activity surveys will inform impact assessment of the development on bat commuting routes and foraging areas, and may require additional mitigation. Any potential legal offences would require a Natural England mitigation licence. Planning consent is a prerequisite. Reasonable Avoidance Measured are preferable.

4.4.3. Compensation

No compensation need for roosts has been identified, but loss of foraging and commuting habitat will need to be compensated by new bat roost boxes. These would be installed on trees, or suitable retained buildings and/or woodland, especially in the south, west, and northeast ends of the site where new woodland and enhanced grassland is being provided. The new woodland provisions will take decades to reach maturity and provide natural roosts; hence the need for artificial alternatives in the interim. The numbers and types will be decided upon completion of the bat activity surveys, once a full picture is known of commuting and foraging routes through the whole April-October season.

### 4.5. Other mammals

4.5.1. Potential impacts

During construction, hedgehogs could be killed and/or displaced if no safeguards were in place. Hedgehog habitat will be permanently fragmented. During construction, loss of ponds and ditches will have a negative impact on water shrews, causing killing/injury and permanent loss of habitat. Fallow deer and other non-protected species could be harmed by construction in the absence of mitigation. No operational impacts are likely.

4.5.2. Mitigation measures

Hedgehog check when clearing vegetation, debris, or other locations where they may shelter. Planting of new woodland, and pasture reversion to meadows, will enhance habitat and connectivity in the south, west, and northeast edges of the site. Humane removal of brown rat colony in HMP Wymott former assault course. Humane methods for any other unprotected species. Ensure construction site fencing prevents fallow deer entry. A carefully-worded planning condition is recommended.

4.5.3. Compensation

Install 10 artificial hedgehog homes in undeveloped parts of the red line boundary, to offset the loss of current shelter habitat.

### 4.6. Barn owl

4.6.1. Potential impacts

Construction will cause permanent loss of existing nest and roost site in B10, and permanent loss of grassland and hedgerows will deplete the small mammal prey resource available for barn owls, although they will still have access to other similar grassland areas to the north.

4.6.2. Mitigation measures

Licensed move of existing nestbox (probably replacing with new) from B11 which will be lost, to B10 which will be retained. The new location will have better access to retained agricultural grassland to the north. Any potential legal offences will require a Natural England mitigation licence. Planning consent is a prerequisite for mitigation licensing.

4.6.3. Compensation

Addition of a new nestbox in B21 to allow for a separate territory in the south of the site.

### 4.7. Other birds

4.7.1. Potential impacts

Construction will cause permanent loss of nesting and foraging habitat for a range of birds, including several Red List and Amber List species. It would also cause destruction of nests, and killing and injury of chicks in the absence of mitigation. For some Red and Amber List species which nest on roofs, such as herring gull, great black-backed gull, and oystercatcher, the construction of new prison buildings will be a positive impact. Possible effects on overwintering birds are unknown at present, but not expected to be significant. There is much similar pasture on farmland in all directions; therefore, it is unlikely that this site provides an important overwintering resource.

The construction of the new prison will have a positive impact by creating new nesting habitat for gulls and oystercatchers.

4.7.2. Mitigation measures

Demolition, tree felling, hedge removal, shrub/scrub removal, and commencement of other enabling works, such as cutting or driving over long grass, infilling ponds, or clearing debris, to avoid the March-August nesting season. If any work must commence within the nesting season, it must be preceded by an ecologist nest check leading to an all clear. Any active nests must be safeguarded with a 5m stand-off using road pins and hazard tape or fencing. A Natural England mitigation licence is not likely to be needed for any species, but a carefully-worded planning condition will be necessary.

4.7.3. Compensation

Breeding habitat compensation by installation of suitable nestboxes in other areas of the site (to provide alternatives in the short term). The number and types must reflect the species and estimated numbers of territories affected. Also, habitat creation (woodland, shrubs, hedgerows, ponds) and enhancements (pasture seeding/reversion) within and outside the development.

### 4.8. Great crested newt

4.8.1. Potential impacts

No breeding ponds will be affected, but terrestrial habitat used by low numbers of GCN could be permanently lost during the construction phase, and a few individual newts could be harmed. The specific areas of potential impact are the southwest and northwest corners of the new prison, the boiler house, and the bowling club. Operational impacts are unlikely.

4.8.2. Mitigation measures

Any potential legal offences will require a Natural England mitigation licence or a District Level Licensing (DLL) scheme alternative. Planning consent is a prerequisite for both. No mitigation is proposed as such, as a DLL will be used to compensate the impacts.

4.8.3. Compensation

DLL will be engaged to offset the impacts. This involves a financial contribution to an off-site habitat-creation scheme run by a Lancashire partnership, with long-term safeguard and management of a network of ponds and terrestrial habitat. In return, a licence is granted to commence work on site without costly traditional mitigation methods (exclusion/drift fencing, pitfall/bottle-traps, capture/translocation).

### 4.9. Other amphibians

4.9.1. Potential impacts

Low numbers of common toad, common frog, and smooth newt could be harmed, and their breeding and terrestrial habitat will be lost permanently during construction. No operational effects.

4.9.2. Mitigation measures

None. There is no requirement to mitigate for loss of widespread amphibians.

4.9.3. Compensation

New compensatory habitat (pond creation, grassland enhancement, woodland planting) to the south and west of the site will fully offset the loss of existing amphibian habitats. DLL for GCN will also have offsetting value for other amphibian species.

### 4.10. Fish

4.10.1. Potential impacts

Potential killing of eels and other fish through destruction of pond and ditches during construction. This is a low likelihood, however. Loss of ditches will cause general reduction in linear aquatic habitat connectivity. No operational effects.

4.10.2. Mitigation measures

None.

4.10.3. Compensation

None.

### 4.11. Invertebrates

4.11.1. Potential impacts

General permanent loss of habitat due to construction. Construction and landscaping will also create new opportunities for invertebrates, though likely a different spectrum of species. Impacts on Lancashire Key Species or other notable/rare species is unknown, as invertebrates were scoped out of phase 2 surveys by GMEU. No operational effects are anticipated.

4.11.2. Mitigation measures

No direct mitigation.

4.11.3. Compensation

No targeted compensation, but habitat creation will offset the loss of habitat.

### 4.12. INNS

4.12.1. Potential impacts

Impacts most likely during enabling works and construction, but there is an ongoing risk during operation. Accidental import or spread of INNS plants (especially damaging WCA 1981 Schedule 9 species), aquatic and soil invertebrates, and fungal and bacterial pathogens are most likely. This can occur on vehicle wheels, digger buckets, chainsaws, clothing, boots, and other equipment, especially those coming from another site. Also, soil around trees and plants from nurseries can import invertebrates (and occasionally vertebrates) from other sites, including INNS.

4.12.2. Mitigation measures

The MoJ has confirmed it will commence an Eradication Plan for the existing Himalayan balsam infestation in September/October 2021, to continue in summers 2022-2024. This will be by hand-pulling and safe disposal of the arisings, including three consecutive summers prior to setting seed. The montbretia and giant rhubarb plants from the new prison area, and the Japanese rose from the wider BNG habitat improvement area, will also be removed and safely disposed of. All arisings from INNS removal must be transported by registered carrier to a controlled waste site.

A Biosecurity Plan will be implemented throughout the development, from enabling works to construction and landscaping. This must be posted prominently in site cabins and on fences. All contractors and visitors must be given a toolbox talk on the dangers of INNS, and the measures to prevent their spread. It is particularly important to be vigilant on sites with waterbodies and watercourses, and those where INNS are already known to be present.

A strict check-clean-dry policy will be enacted, to ensure no INNS are imported or spread on equipment, vehicles, materials, clothing, or boots. INNS identification posters will be shared and posted prominently, including the most common conspicuous INNS plants. Any new infestations or potential biosecurity breaches must be reported to the site manager, who will call an ecologist immediately. INNS monitoring will take place at monthly intervals. implemented. A carefully-worded planning condition will be beneficial.

## 5. Residual impacts, cumulative effects, enhancement measures

### 5.1. Overview

It is not possible to accurately define mitigation, compensation, and enhancement measures, as there is unavoidable overlap between them. Nevertheless, it is assumed that all woodland creation is mitigation, and all pond creation in the 'wider BNG habitat area' is enhancement.

| Ecological features | Residual impacts | Cumulative effects | Enhancements |
|---|---|---|---|
| Designated sites | None | Possible distant effect on Ribble Estuary designated sites. Likely to be screened out. | None |
| Habitats | Net loss of broadleaved woodland and wet ditches. | None | Net gain in seminatural habitats, contributing significantly to National Habitat Network local targets. Six new ponds. Net increase in neutral grassland after habitat trading. |
| Bats | Possible loss of woodland roosts. Disruption of commuting routes, foraging areas. | None | Net increase in roost availability by installation of batboxes in trees. |
| Other mammals | None | None | New ponds will increase habitat for water shrews. |
| Barn owl | Net loss of foraging habitat. | None | New nestbox in B21, and habitat enhancements in south part of wider site, will allow net gain in territories. |
| Other birds | None | None | Net gain in habitat for meadow and roof-nesting species. Nestboxes/bricks for swifts, house martins, house sparrows. |
| Great crested newt | None. | Net gain in connectivity with other local/district populations. Significant benefit for GCN status in district. | Significant net gain in ponds, terrestrial habitat, population size/extent, and future prospects at local/district level. |
| Other amphibians | None | None | Net gain in local habitat and populations. |
| Fish | Reduction in ditch connectivity for eels. New ponds will be kept fish-free to benefit GCN at local level. | None | Six new ponds will offset loss of ditches, and provide significant habitat for eels. |
| Invertebrates | None | None | Bee-bricks in new buildings. Net gain in aquatic habitat area and diversity. |
| INNS | None | None | Eradication of existing infestations and occurrences. |

Table 7 – Residual impacts, cumulative effects, and enhancement measures.

The necessity of achieving BNG requires enhancement, but the Biodiversity Metric's habitat trading system makes it difficult to say which measures are enhancement, and which are compensation. Thus, the process must be caveated.

### 5.2. Designated sites

5.2.1. Residual impacts

None.

5.2.2. Cumulative impacts

None. In-combination effects on distant Ribble sites (greater than 5km away) are likely to be insignificant. Comparison with other significant recent developments, such as the Leyland test track housing development, will serve as a guide as to whether HRA screening is necessary.

5.2.3. Enhancements

None.

### 5.3. Habitats

5.3.1. Residual impacts

The permanent loss of mature woodland through construction cannot be immediately compensated by new planting (a fact that is built into the Metric's BNG calculations). New woodland will not provide the same quality of habitat as the woodland lost for at least 30 years.

5.3.2. Cumulative impacts

None.

5.3.3. Enhancements

Woodland planting, grassland enhancement, and hedgerow creation will each produce a net surplus by area, which can be viewed as an enhancement. Six new ponds (0.50ha) will be created in the south and west pasture-enhancement areas, which are all gains. These mitigation, compensation, and enhancement provisions will contribute significantly to National Habitat Network local targets. The HMP will ensure favourable management for 30 years.

### 5.4. Bats

5.4.1. Residual impacts

Loss of woodland, and construction of urban habitats, are likely to have a residual impact. This cannot be accurately quantified until completion of the activity surveys in October 2021, and will be identified in a report during determination. There should be no residual impacts once alternative roost provisions and habitat enhancements are made.

5.4.2. Cumulative impacts

None.

5.4.3. Enhancements

Regardless of the mitigation/compensation needed above, at least 20 batboxes (artificial roosts), for a range of species and roost types, should be installed in suitable locations on new builds and retained trees around the prison estate.

### 5.5. Other mammals

5.5.1. Residual impacts

None.

5.5.2. Cumulative impacts

None.

5.5.3. Enhancements

Install 20 hedgehog homes in woodland and densely-vegetated sheltered locations around the site.

### 5.6. Barn owl

5.6.1. Residual impacts

Net loss of foraging habitat due to construction of new prison. Move of existing nestbox from B11 to B10 carries a minor risk, but is likely to be successful, as B10 is already a regular roosting site for the barn owls in question.

5.6.2. Cumulative impacts

None.

5.6.3. Enhancements

Seeding of poor-quality pasture, and removal of intensive grazing to the south and west of the site, will provide a significant increase in foraging habitat for barn owls. This could sustain a new territory.

### 5.7. Other birds

5.7.1. Residual impacts

The loss of woodland and seminatural habitats will have a short- to medium-term impact on breeding habitat. In the long term, there will be no residual impacts once compensatory woodland and other habitats are mature. There may be negative residual impacts on some overwintering bird species, if short-sward pasture reverts to tall meadow.

5.7.2. Cumulative impacts

None.

5.7.3. Enhancements

At least 10 integrated swift (*Apus apus*) nest-bricks installed on upper east or north elevations of new builds, at least 5m high, away from windows. At least 10 house sparrow (*Passer domesticus*) terraces installed in suitable locations on new builds. Both are BoCC Red List species (Eaton *et al,* 2015). Neither species is currently recorded as nesting on site. Further enhancements could easily be provided for other species, such as house martin (*Delichon urbicum*), an Amber List species. The construction of the new prison will provide nesting habitat for roof-nesting species including herring gull (Red List), great black-backed gull (Amber List), and oystercatcher (Amber List).

### 5.8. Great crested newt

5.8.1. Residual impacts

None. Resolved by DLL.

5.8.2. Cumulative impacts

None.

5.8.3. Enhancements

The creation of six ponds and botanically-diverse longer-sward grassland to the south and west of the site will be a significant enhancement for GCN. The new pond network will connect the landscape to the south, west, and north of the site. The few scattered ponds on site will become part of a large network of ponds, including the known metapopulation at the PAAS fishing lakes. All ponds on site will be treated to remove sticklebacks and other fish, thus making them suitable for GCN breeding. These interventions will create an important GCN metapopulation of district importance. This will be a net gain in GCN conservation status (range, habitat, population, prospects) at local and district level.

### 5.9. Other amphibians

5.9.1. Residual impacts

None.

5.9.2. Cumulative impacts

None.

5.9.3. Enhancements

Likely to be a net gain in local amphibian status. The proposed pond creation and grassland enhancement measures will yield a net gain in amphibian habitat.

### 5.10. Fish

5.10.1. Residual impacts

Although the ditches are generally too shallow for fish, there may be a net loss in linear aquatic habitat connectivity for eels. This will be partly offset by the creation of six new ponds, but not in the northeast of the site where connectivity may be lost. New ponds must be kept fish-free to benefit GCN and other amphibians.

5.10.2. Cumulative impacts

None.

5.10.3. Enhancements

None.

### 5.11. Invertebrates

5.11.1. Residual impacts

None. Loss of habitats will be offset by creation of a different suite of habitats.

5.11.2. Cumulative impacts

None.

5.11.3. Enhancements

At least 20 integrated bee-bricks will be installed in the upper courses of suitable sunny elevations of new builds, where they will receive maximum sunlight. If the construction is not brick, bee-bricks can be placed on the roofs of suitable buildings instead of integrating them into the elevations. Bee-bricks are standard brick size, with short tunnels for solitary bees to nest in. They closed at the rear, so do not allow for insect entry to wall cavities.

Creation of new ponds will increase diversity and extent of aquatic habitats available to invertebrates. A planning condition would be useful to ensure implementation. Pond creation and grassland enhancement is likely to yield a net gain in invertebrate diversity and biomass.

The net gain in ponds will have a positive effect on aquatic invertebrates, Odonata, and some other groups.

### 5.12. INNS

5.12.1. Residual impacts

None. The development will not have any negative impacts from INNS, as a Biosecurity Plan will be in operation, and an INNS Eradication Plan will have been completed by July 2024.

5.12.2. Cumulative impacts

None.

5.12.3. Enhancements

The Himalayan balsam alongside the north boundary track, montbretia and giant rhubarb in the new prison area, and Japanese rose in the wider site BNG area, will be subjected to an Eradication Plan from autumn 2021 to July 2024. This will be an enhancement over the current INNS status.

## 6. Monitoring

### 6.1. Overview

Monitoring is a legal requirement for any species requiring a mitigation licence. It may also be conditioned through planning for other ecological features, such as habitats, especially with the advent of BNG. It is also good practice to demonstrate that intelligence-gathering and decision-making have been good. The CEMP will include compliance monitoring during construction. The HMP will involve condition monitoring during the operational phase.

### 6.2. Habitats

Habitat monitoring will be necessary on the enhanced grasslands, woodland planting, and new ponds. This will evaluate the effectiveness of the post-development habitat provisions in the BNG Metric, which will be agreed through planning. Annual monitoring over five years will be sufficient for grassland and new ponds. Woodland must be monitored annually for disease and other failure over five years. Monitoring should then continue at five-year intervals for 30 years, to observe the establishment of the target habitat. All habitat monitoring must have a feedback loop, to remedy any failure of quality or extent.

### 6.3. Bats

The B15 maternity roost must be monitored post-development, to check that it has not been negatively impacted by the development. Monitoring of commuting routes will also be necessary, to check the impacts of the development have been correctly predicted. If any hitherto-unknown impacts are identified, additional *post-facto* compensation will be necessary.

### 6.4. Barn owl

Continued presence and breeding success must be monitored at the moved B10 nestbox and new B21 nestbox. This will be a condition of the Natural England licence. Dusk/dawn surveys should also be undertaken, to identify whether a new territory has been accommodated on site.

### 6.5. Great crested newt

The DLL will not require GCN monitoring on site. However, it will be good practice to monitor GCN presence-absence in the new ponds in post-development years 1, 3, and 5, using eDNA to evaluate the effectiveness of the habitat creation and fish removal works. Population surveys would be useful, but are unlikely to be justified financially.

### 6.6. INNS

The Himalayan balsam eradication programme will involve monitoring over a three-year treatment period, or longer if necessary, until eradication is complete. It will be good practice to monitor the site for INNS plants on an annual basis, as part of the site's general maintenance programme. This can be conducted by trained non-ecologists.

## 7. Conclusions

The proposed scheme involves construction of a new prison, boiler house, and bowling club on existing agricultural land. The impacts on habitats will be fully compensated, with a net gain in several habitats. Despite mitigation, bats, birds, and GCN will be negatively impacted, requiring well-thought-out mitigation and compensation programmes, under mitigation licence where necessary. Some surveys are not yet complete (bat activity, bat woodland roosts).

The development is predicted to achieve at least 20% BNG by area, and 10% hedgerow BNG. The surveys and proposed mitigation adhere to standard mitigation guidance for bats, other mammals, birds, GCN, and other species groups.

The CEMP will minimise impacts during construction. The HMP will ensure favourable management of the retained, enhanced, and created habitats in the long term.

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## 9. Appendices

Appendix 1 – Legislative and policy framework

Appendix 2 – Ramboll PEA, CGO PEA, CGO phase 2 ecology reports (INNS, reptiles, bat roosts)

## Appendix 1 – Legislative and policy framework

Many species of wildlife and habitat types in Britain are protected by laws such as the Wildlife and Countryside Act 1981 (as amended) (WCA 1981), Protection of Badgers Act 1992, Habitats Regulations 2019 (post-Brexit), Natural Environment and Rural Communities Act 2006 (NERC Act 2006) (esp. Section 41), and Hedgerow Regulations 1997. Works that may harm or disturb protected species, or damage their habitats, must be impact-assessed by an ecologist, and mitigated or compensated, as necessary.

A PEA is the first stage, typically involving an Extended Phase 1 Habitat Survey to assess the site's ecological value and potential impacts of the proposed development on protected and notable species, habitats and protected sites. This may be followed by 'phase 2' species surveys and/or a full Ecological Impact Assessment (EcIA) if required under The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

Buildings, structures, and trees may require a PRA for bats, either as part of a PEA, or as a separate survey. This may result in the need for further surveys to satisfy planning.

Trees can be protected individually or as a group/area by a Tree Preservation Order (TPO) under the Town and Country Planning Act 1990 (as amended) and/or the Town and Country Planning (Tree Preservation) (England) Regulations 2012.

Where a development may have an impact on an internationally-protected site, an 'appropriate assessment' (AA) also known as a 'Habitats Regulations Assessment' (HRA) may be necessary under the Habitats Regulations 2019. The 'competent authority' responsible for this process is usually the LPA, but an ecological consultancy can provide 'shadow HRA screening' and/or a shadow AA/HRA on its behalf.

LPAs also have a duty under the National Planning Policy Framework (NPPF) (MHCLG, 2021) to deliver measurable Biodiversity Net Gain (BNG), i.e. no net loss, plus enhancements, for all developments. BNG must be in addition to any mitigation or compensation provisions required to achieve no net loss. Defra's Biodiversity Metric 2.0 is becoming widely adopted as the standard calculator, using a habitat list based on the new UKHab system rather than traditional Phase 1 habitat system. Its effective use requires proficiency in both UKHab and botanical identification. Metric 3.0 was released in July 2021. The Environment Bill, which is due to be enacted in autumn 2021, will require 10% BNG on all developments, and consistent adoption across the country.

The UK Biodiversity Action Plan (UKBAP) no longer exists as a formal policy instrument, but it continues in spirit. Its Priority Habitats continue to be used in the UKHab and BNG Metric systems, and 'BAP species' are given a degree of protection through Section 41 of the NERC Act 2006.

BREEAM is a sustainability scoring scheme adopted voluntarily by developers. It assesses projects against many factors, awarding credits against ecological categories such as early involvement of an ecologist, and compensation of lost habitats with species-rich landscaping. The key tool is the Change in Ecological Value Calculator. This and other ecological information must be input by a Suitably-Qualified Ecologist (SQE). The available ecological credits are as follows: LE02 (low ecological value site, protecting ecological features), LE03 (minimising impact on ecology), LE04 credits (enhancing site ecology), and LE05 credits (following SQE recommendations, habitat management plan in place).

The Ministry of Justice's New Prisons Programme aims to achieve at least 10% BNG and 'Outstanding' in BREEAM score for all new prisons.

In Lancashire, ‘Lancashire Key Species’ are a material consideration in planning. These are equivalent to the obsolete UKBAP system. A network of ‘local site’ also exists, which are non-statutory designated sites with a *de facto* protection through consideration in the planning system.

Intended for
**Mace Group**

Date
**14th October 2020**

Project Number
**1620010134**

# ALBATROSS & RAZORBILL PRELIMINARY ECOLOGICAL APPRAISAL

RAMBOLL

# ALBATROSS & RAZORBILL
# PRELIMINARY ECOLOGICAL APPRAISAL

| | |
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# 1. INTRODUCTION

## 1.1 Background

Ramboll UK Limited ('Ramboll') was commissioned by Mace Group (the 'Client'), to provide a Preliminary Ecological Appraisal (PEA) of the 'Albatross & Razorbill' development site, located at Her Majesty's Prison (HMP) Wymott and HMP Garth, Ulnes Walton Lane, Leyland, Preston, Lancashire, PR26 8LW (the 'site') in advance of the construction of a new prison at the site. The site is centred upon OS grid reference SD 502 205, as shown in Figure 2 (Appendix 1).

## 1.2 Objectives

The aim of this report is to provide a PEA of the site (CIEEM, 2017[1]). PEA is the term used to describe a rapid assessment of the ecological features present, or potentially present, within a site and its zone of influence (ZOI). The ZOI is the area over which ecological features may be affected by the biophysical changes caused by demolition of the site and its associated activities. The structure and content of the report is based on current ecological report writing guidance (CIEEM 2017[2] and BSI Standards Institution 2013[3]).

The content of this report is based on the findings of:

- A desk study;
- An extended Phase 1 habitat survey; and
- A daytime inspection of buildings/ trees for bats.

The specific objectives of this report are to:

- Assess the potential for the site to support populations of protected species or species of nature conservation importance[4];
- Record the main habitats and features of ecological interest on the site;
- Assess the overall ecological importance of the site;
- Provide recommendations for any additional further surveys (if required); and
- Provide recommendations for the protection of the site's ecological features during demolition.

The report is supported by the following appendices:

- Appendix 1: Figures; and
- Appendix 2: Legislation and Policy Context; and
- Appendix 3: Site Photographs.

[1] CIEEM (2017). Guidelines for Preliminary Ecological Appraisal, Second Edition. Chartered Institute of Ecology and Environmental Management (CIEEM), Winchester.
[2] CIEEM (2017) Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
[3] BSI Standards Institution (2013). BS 42020:2013. Biodiversity – Code of Practice for Planning and Development. BSI Standards Limited, London.
[4] The following species are considered to be of nature conservation importance: i) listed as a national priority for conservation (such as those listed as habitats and species of principal importance for the conservation of biodiversity under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006; ii) listed as a local priority for conservation, for example in the relevant local Biodiversity Action Plan (BAP); iii) assessed as a threatened or near-threatened species according to International Union for the Conservation of Nature (IUCN) red list criteria; iv) Red or Amber Listed species in national Species of Conservation Concern assessments; v) listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or a Nationally Notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/or vi) endemic to a country or geographic location (including endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

### 1.3 Proposed Development

This PEA is required in connection with an Outline Planning Application (OPA) for the proposed construction of a new prison, preferably located to the north of the existing HMP Wymott and east of HMP Garth, comprising:

- House blocks;
- Care and Support Unit (CASU);
- Entrance Hub;
- Support Building;
- Central Services Hub;
- Workshops;
- Kitchen;
- Kennels; and
- Associated hard and soft landscaping, including perimeter fencing.

No detailed plans are available at this stage.

### 1.4 Legislation and Policy Framework

Various legislation and planning policies refer to the protection of wildlife. These are summarised in Appendix 2 but should not to be regarded as a definitive legal opinion. When dealing with individual cases, the full texts of the relevant documents should be consulted, and legal advice obtained if necessary.

# 2. METHODOLOGY

## 2.1 Desk Study

The purpose of the desk study was to collect existing baseline data about the site and ZOI, including the location of designated sites or other natural features of potential ecological value. The following ZOI has been considered:

- Statutory designated sites up to 2km from the site, including Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR); and
- Records of European Protected Species licences issued within 2km of the site.
- Non-statutory designated sites – Sites of Importance for Nature Conservation (SINCs) – up to 2km from the site;
- Records of protected species up to 2km from the site; and
- International and national statutory designated sites with bats as a qualifying feature for the designation, up to 10km from the site.
- Other habitats of importance up to 500m from the site (including ponds and woodland).

Lancashire Environment Record Network (LERN) was contacted to provide details of designated sites and protected species within 2km of the site.

In addition, the Multi Agency Geographic Information for the Countryside (MAGIC) website[5] was searched for information on statutory sites and European Protected Species (EPS) licences issued within 2km of the site. Supplementary information on the application site and its surroundings were obtained from aerial images available from Google™ Earth.

A Preliminary Ecological Appraisal (PEA) was previously carried out on 18th February 2019/ 19th February 2019 by Arcadis on behalf of the Ministry of Justice (MoJ), undertaken outside of the optimal survey season. The results of that previous survey have been reviewed to obtain further details about baseline conditions at the site and are derived from the following report, supplied by the Client:

- MoJ Provision of Ecological Consultancy. Phase 1 Habitat Survey – HMP Wymott and HMP Garth. Arcadis Consulting (UK) Limited, April 2019.

## 2.2 Extended Phase 1 Habitat Survey

An extended Phase 1 habitat survey of the site was undertaken by Jonathan Molesworth of Ramboll on 21st September 2020 and 22nd September 2020. The weather throughout the survey was fine and dry, with occasional scattered cloud.

Jonathan is an ecologist with five years' experience and holder of Natural England and Natural Resources Wales licences for great crested newt *Triturus cristatus*, a NE licence for white-clawed crayfish *Austropotamobius pallipes*, associate membership with CIEEM and a first-class degree in Biological Sciences from the University of Liverpool. The surveyor was accompanied by a prison escort.

The survey involved a site walkover and preliminary assessment of key habitats, land use and ecological features. The main habitats present were recorded using standard Phase 1 habitat survey methodology as described in the Handbook for Phase 1 Habitat Survey (JNCC, 2010[6]) and mapped (Appendix 1; Figure 2). In addition to general habitat classification, a list was compiled

[5] www.magic.gov.uk, accessed 11th July 2018

[6] Joint Nature Conservation Committee (JNCC) (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit. JNCC Peterborough

of observed plant species (using the nomenclature of Stace, 2010[7], with common and Latin names referred to in the first instance after which only the common names are used). The Phase 1 habitats were translated into UKHab habitat types using the Natural England metric translation tool and were assessed on site using the UK Habitat Classification Field Key. The abundance of each species was estimated for each habitat respectively using standard 'DAFOR' codes:

- D = Dominant.
- A = Abundant.
- F = Frequent.
- O = Occasional.
- R = Rare.

The potential of the site to support protected fauna was evaluated, in order to identify potential ecological constraints, to guide recommendations and determine the requirement for any additional survey(s) or inform mitigation.

Any habitats/ features on the site that provide suitability for refuge/ hibernation, foraging and basking for reptiles were recorded. The suitability of terrestrial habitats on the site for GCN and other widespread species of amphibian was also assessed. An assessment of aquatic habitats for GCN was undertaken, as detailed in Section 2.3.

An assessment of the suitability of trees and/ or buildings for bats was undertaken, as detailed in Section 2.4.

A search for badger *Meles meles* setts, excavations and other field signs indicative of this species (such as badger paths, scrapings/ snuffle holes, latrines/ dung pits, scratching trees and diurnal resting places) was undertaken.

The suitability of any waterbodies and/ or watercourses on or immediately adjacent to the site for water vole *Arvicola amphibius* and otter *Lutra lutra*, was assessed. Although comprehensive water vole/ otter surveys were not undertaken, any incidental observations of conspicuous field signs indicative of these species were recorded.

The importance of the site for use by breeding and overwintering birds was evaluated and a search for active/ disused bird nests was undertaken, where appropriate. An inspection of any suitable trees/ buildings was carried out, to assess their potential to provide nesting and/ or roosting opportunities for birds of prey, including barn owl *Tyto alba* and kestrel *Falco tinnunculus*.

The potential of the site to support other protected species and/ or species of conservation concern, including mammals such as hazel dormouse *Muscardinus avellanarius*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus* and polecat *Mustela putorius*, as well as invertebrates (both terrestrial and aquatic), was also assessed.

## 2.3 Great Crested Newt Habitat Suitability Index (HSI)

The potential for any aquatic habitats/ ponds on site to be used for breeding by amphibians was evaluated. This included an assessment of ponds within the site (and ZOI, where feasible) for their suitability to support great crested newt (GCN) using the Habitat Suitability Index (HSI) tool, developed by Oldham *et al.* (2000)[8].

[7] Stace, C. (2010) New Flora of the British Isles 3rd Edition. Cambridge University Press

[8] Oldham et al. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

This assessment uses a scoring system, derived from ten 'Suitability Indices' (SI1 – SI10) which were measured for each pond:

- Pond location;
- Pond area;
- Pond drying;
- Water quality;
- Shade (percentage of pond perimeter);
- Impacts of waterfowl;
- Presence of fish;
- Number of ponds within a 1km radius;
- Suitability of surrounding terrestrial habitat; and
- Macrophytes (percentage cover).

An assessment of the results of the HSI was undertaken using standard methodology (Oldham *et al.* 2000 and Amphibian and Reptile Group (ARG), 2010) [9]. The score for each of the suitability indices was then used to ascertain an HSI score for each pond. HSI scores relating to the suitability of the ponds assessed to support GCN are described in Table 2.1.

**Table 2.1: Pond Suitability for Great Crested Newt (GCN) in Relation to HSI Score**

| HSI Score | Suitability for Supporting GCN |
|---|---|
| <0.5 | Poor suitability |
| 0.5 – 0.59 | Below average suitability |
| 0.6 – 0.69 | Average suitability |
| 0.7 – 0.79 | Good suitability |
| >0.8 | Excellent suitability |

This tool has been developed to provide a measure of the suitability of a pond to support GCN and should not be used as a substitute for presence/ likely absence surveys where they are required.

## 2.4 Preliminary Roost Assessment (PRA)

In accordance with the guidance outlined in Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Ed. (Collins, 2016)[10] all suitable trees and/ or buildings present upon (or immediately adjacent to) the site were subject to a daytime assessment during the Phase 1 habitat survey(s), for their potential to support roosting bats.

All suitable trees were assessed from ground level. Features considered particularly suitable to support roosting bats include natural holes; woodpecker holes; cracks/ splits in major limbs; loose/ peeling bark; partially detached and thick-stemmed ivy; other hollows/ cavities; and existing bat, bird or mammal boxes.

All buildings were subject to a brief external assessment, to identify exterior features considered particularly suitable to support roosting bats and any potential ingress/ egress points. A comprehensive external and internal inspection was not carried out.

[9] ARG UK (2010), ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom
[10] Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust (BCT).

Each tree/ building is classified into a category dependent on the presence of features suitable to support bat roosts. The categories assigned are: Confirmed Roost, High, Moderate, Low and Negligible potential for use by bats. Table 2.2 provides criteria for each of these categories.

**Table 2.2: Bat Roost Potential Categories**

| Roost Potential | Description |
|---|---|
| Confirmed | A building, structure or tree that is confirmed to support a bat roost. |
| High | A building, structure or tree with one or more potential roost site that is obviously suitable for use by larger numbers of bats on a regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. |
| Moderate | A building, structure or tree with one or more potential roost site 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. |
| Low | A building, structure or tree with one or more potential roost site that could be used opportunistically by individual bats.<br>Trees of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with very limited roosting potential. |
| Negligible | No potential features likely to be used by roosting bats identified and bats very unlikely to be present. |
| Notes: Category descriptions are drawn from Collins (2016) | |

The value of the site and surrounds for foraging and commuting bats was also evaluated.

## 2.5 Assessment of Importance of Ecological Features

The importance of ecological features (i.e. designated sites, habitats and species) identified within the zone of influence has been assessed using a scale that classifies ecological features within a defined geographic context in accordance with CIEEM guidelines (2018[11]). The classification uses recognised and published criteria (e.g. Ratcliffe, 1977[12]; Wray *et al.* 2010[13]) where the habitats and site were assessed in relation to their size, diversity, naturalness, rarity, fragility, typicalness, connectivity with surroundings, intrinsic value, recorded history and potential value. The following geographic frame of reference has been used for the site:

- International Importance;
- National Importance (England);
- Regional Importance;
- County Importance;
- Local Importance;
- Site Importance (limited to the application site boundary); and
- Negligible Importance.

A wide range of sources can be used to assign importance to ecological features, including legislation and policy. In the case of designated sites, their importance reflects the geographic context of the designation. For example, sites designated as SACs are recognised as being of importance at an International level. Ecological features not included in legislation and policy may also be assigned importance, due to, for example, local rarity or decline, or provision of a

[11] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute for Ecology and Environmental Management, Winchester.
[12] Ratcliffe, D. (1977) A Nature Conservation Review. Cambridge University Press
[13] Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010) Valuing Bats in Ecological Impact Assessment. In Practice, pp 23-25

functional role for other ecological features. Professional judgement is used to assign such importance.

## 2.6 Limitations

The extended Phase 1 habitat survey of the site was undertaken in September, which is just within the optimal time of the year for carrying out this type of survey.

An extended Phase 1 habitat survey provides a snapshot of ecological conditions and does not record plants or animals that may be present at the site at different times of the year.

The conclusions presented in this report represent Ramboll's best professional judgment based upon the information available and conditions existing as of the date of this report.

All areas within the outer security fences surrounding both existing prisons (HMP Garth and HMP Wymott) were not surveyed. The areas not surveyed are shown in Figure 2 (Appendix 1). Ponds present on or immediately adjacent to the site were visited during the survey. Ponds within the ZOI but outside of the site boundary were not assessed. The western extent of the woodland present within the southwest portion of the site was not fully accessible during the survey due to being heavily waterlogged. This report does not present data on, or discuss ecological constraints posed by any ecological receptors that may be present in the un-surveyed part(s) of the site or ZOI.

This report has been prepared for the client and shall not be relied upon by any third party unless that party has been granted a contractual right to rely on this report for the purpose for which it was prepared.

Ramboll is satisfied that this report represents a robust appraisal of the site for the purpose of informing the PEA. If any action or development has not taken place on this land within six months of the date of this report, the findings of this survey should be reviewed by a suitably qualified ecologist and may need to be updated.

# 3. BASELINE CONDITIONS

## 3.1 Desk Study

### 3.1.1 Landscape Context

The site is set in a rural location, situated immediately southwest of the town of Leyland, approximately 6.5km south of Preston. Two existing prisons are located on the site; HMP Wymott (a Category C prison), situated in the eastern portion of the site and HMP Garth (a Category B prison), situated in the northwest portion of the site. To the north, south, east and west of the site is predominantly agricultural land, isolated stands of woodland/ copse and several small waterbodies, with a plot of residential housing to the northeast. A singe track railway line lies immediately west.

### 3.1.2 Designated Sites

*Statutory Sites*

No SPAs, SACs, SSSIs, NNRs or LNRs are located on or within 2km of the site.

*Non-Statutory Sites*

A LERN search identified four Biological Heritage Sites (BHS) within 2km of the site. These are listed in Table 3.1, below. No non-statutory sites are located within the site boundary itself.

**Table 3.1: Sites of Importance for Nature Conservation within 2km of the Site**

| Name | Type | Distance from Site (m)/ Direction | OSGR | Description |
|---|---|---|---|---|
| Ulnes Walton | BHS | 20 / northwest | SD496208 | The site comprises two adjacent areas of land associated with former clay extraction and the Ulnes Walton Landfill Site. Both units form mitigation/ compensation measures relating to phases in the extension of the landfill site. The northern unit replaces the loss of a wildlife site and the southern for lost great crested newt breeding ponds and terrestrial habitat.<br>The northern unit contains a large water body, small ponds, swamp and areas of species-rich grassland. The large water body is surrounded by reed and scrub and supports breeding birds and waterfowl. The swamp is attractive to snipe *Gallinago gallinago* during the winter. The grassland is variable with a number |

| Table 3.1: Sites of Importance for Nature Conservation within 2km of the Site | | | | |
|---|---|---|---|---|
| | | | | of areas of species-rich sward.<br>The southern unit adjoins the railway and comprises scrub and tall-herb grassland with four ponds. The ponds support an amphibian assemblage of great crested newt, smooth newt, common frog and common toad. These ponds act as the receptor ponds for great crested newt and other amphibian translocation. The land surrounding the ponds is dominated by species-rich tall-herb grassland and scrub. The different habitats on the site are attractive to a range of butterflies. |
| Bretherton Road Meadow | BHS | 754 / east | SD487196 | The site comprises an area of low-lying, damp grassland adjacent to the tidal River Lostock. The sward is dominated by numerous grasses. Shallow remnants of old ditches cut across the site and support characteristic wetland plants. The site supports many herb species characteristic of old, agriculturally unimproved grassland. |
| Clay 'Ole | BHS | 821 / north | SD486198 | The site comprises a flooded brick-pit with surrounding grassland and scrub. The Clay 'Ole is the type-locality for a freshwater ribbon-worm species. This is the only known site for this species in the world. Tubular Water-dropwort *Oenanthe fistulosa*, a species included in the Provisional Lancashire Red Data List of Vascular Plants, is also present. The surrounding land supports a wide variety of plant species characteristic of neutral grassland and supports a range of breeding birds. It |

| Table 3.1: Sites of Importance for Nature Conservation within 2km of the Site | | | | |
|---|---|---|---|---|
| | | | | provides wintering habitat for a passage-site for other birds. |
| Barber's Moor Pasture | BHS | 885 / east | SD490196 | The site comprises a damp, low-lying field, adjacent to the River Lostock, and a disused factory lodge. The grassland vegetation is locally dominated by rushes and sedges and supports a rich flora, characteristic of wet grassland. The disused factory lodge supports great crested and smooth newts. |

## 3.2 Habitats

The following descriptions of habitats should be read in conjunction with Figure 2: Phase 1 Habitat Plan (Appendix 1).

### 3.2.1 General Site Description

The site is irregular in shape and occupies an area of approximately 90.7 hectares (ha).

Two existing prisons occupy larges areas on the site: HMP Garth in the west (approximately 13.2 ha) and HMP Wymott in the east (approximately 17.0 ha). The southwest portion of the site is dominated by a large stand of woodland known as Stanning's Folly, and belts of plantation woodland dominate much of the northwest and southeast of the site. Fields of improved grassland associated with a working farm constitute the northeast and southern-most portions of the site, grazed by livestock in the northeast and cut for sileage in the south. Further strips of improved grassland directly surround both prisons. A mosaic of habitats including plantation woodland, improved grassland, marshy grassland, amenity grassland and scattered trees occur in the central areas of the site, between HMP Garth and HMP Wymott. Numerous farm buildings and prison ancillary buildings are spread throughout the site. Ditches, both wet and dry, as well as numerous ponds are present upon the site itself.

### 3.2.2 Broadleaved Semi-Natural Woodland

Stanning's Folly is a large (over 12 ha) area of broadleaved semi-natural woodland which dominates the southwest corner of the site. A diverse age range of trees was noted throughout the woodland with a good number of mature trees present.

- The western half of Stanning's Folly is predominantly wet woodland, dominated by alder *Alnus glutinosa* and with abundant willow *Salix spp.*, and featuring ash *Fraxinus excelsior*, pedunculate oak *Quercus robur*, poplar *Populus spp.* and crab apple *Malus sylvestris* (TN1). This portion of woodland was mostly flooded at the time of the extended Phase 1 habitat survey, with soft rush *Juncus effusus* dominating the ground flora. The drier fringe areas feature tufted hair-grass *Deschampsia cespitosa*, common nettle *Urtica dioica*, bracken *Pteridium aquilinum* and occasional bramble, with hawthorn *Crataegus monogyna* and dog rose *Rosa canina* forming a shrub layer. This area meets the UKHab criteria of 'w1d – wet woodland'.

- The eastern half of Stanning's Folly is dry and composed of ash, alder, pedunculate oak, silver birch *Betula pendula*, poplar, willow, beech *Fagus sylvatica* and sycamore *Acer pseudoplatanus*, with elder *Sambucus nigra*, hawthorn and hazel *Corylus avellana* forming a shrub layer. A small number of pine *Pinus spp.* trees were also noted. The ground flora features herb Robert *Geranium robertianum*, common nettle, ivy *Hedera helix*, wood avens *Geum urbanum*, tufted hair-grass and bracken. The understorey in areas to the northeast and south were choked with bramble *Rubus fruticosus*. This area meets the UKHab criteria of 'w1f – lowland mixed deciduous woodland'.

Stanning's Folly is included on Natural England's Priority Habitat Inventory as deciduous woodland (MAGIC) and features excellent connectivity with other small areas of woodland to the south and west of the site.

Two other very small stand of broadleaved semi-natural woodland are also present immediately to the north and south of HMP Wymott. These areas contain a mixture of species including ash, sessile oak *Quercus petraea*, sycamore, alder, cherry, willow, elder and common lime *Tilia* × *europaea*. These areas meet the UKHab criteria of 'w1g – other woodland; broadleaved'.

3.2.3 Broadleaved Plantation Woodland

Stanning's Folly is directly surrounded to the east and west by a narrow belt of broadleaved plantation woodland, dominated by ash, and with frequent hawthorn, alder, silver birch, willow, grey poplar *Populus* × *canescens*, hybrid black poplar *Populus x canadensis* and hazel. Trees are mostly young to semi-mature and some trees still have spiral guards. A significant proportion of the understorey is bare, although common nettle, herb Robert, bracken, tufted hair-grass and bramble are present in some areas.

Belts of broadleaved plantation woodland continue around the western and northern edge of the site, comprising a similar species composition as that which surrounds Stanning's Folly; however, a slightly more diverse ground flora was noted in places, with hart's-tongue fern *Asplenium scolopendrium*, false brome *Brachypodium sylvaticum* and common hogweed *Heracleum sphondylium* recorded. Two smaller stands of plantation woodland with a similar species composition to the above are situated directly to the west of HMP Wymott/ south of HMP Garth. Occasional soft rush *Juncus effusus* and hard rush *Juncus inflexus* were also recorded within these areas.

Evidence some damage by wild deer was noted within these areas of plantation woodland.

These areas meet the UKHab criteria of 'w1g – other woodland; broadleaved'.

Along the eastern site boundary and the eastern extent of the southern site boundary exists belts of young, mainly broadleaved plantation woodland planted as screening for the residential housing within the last 30 years. Species include ash, sessile oak, pedunculate oak, hazel, rowan *Sorbus aucuparia*, silver birch, poplar, willow, alder and horse chestnut *Aesculus hippocastanum*, with very occasional Scots pine *Pinus sylvestris*. Ground flora is dominated by common nettle and bramble throughout, with occasional herb Robert and cow parsley *Anthriscus sylvestris*.

This area meets the UKHab criteria of 'w1h5 – other woodland; mixed; mainly broadleaved'.

3.2.4 Scattered & Dense Scrub

Scattered scrub bounds a farm track and yard areas at the southern extent of the site, dominated by bramble and also featuring hawthorn, blackthorn Prunus spinosa and elder, intermixed with tall herbs including redshank *Persicaria maculosa*, creeping thistle *Cirsium arvense*, broad-leaved dock *Rumex obstifolius*, common nettle and greater willowherb *Epilobium hirsutum*.

A small stand of scattered scrub exists between prison carparks, located centrally within the site. This is dominated by bramble, with the inclusion of creeping thistle, spear thistle *Cirsium vulgare*, common fleabane *Pulicaria dysenterica* and willowherb *Epilobium spp*.

These areas meet the UKHab criteria of 'h3d – bramble scrub'.

A small area of dense scrub is present to the southeast corner of Stanning's Folly, composed of bramble, willow, ash and dog rose, with the inclusion of rosebay willowherb *Chamerion angustifolium*, common hogweed, teasel *Dipsacus fullonum* and common fleabane.

Scattered scrub in the north of the site, intervening stands of plantation woodland, features bramble, silver birch, hazel and alder, with sparser areas dominated by tall herbs such as common nettle, greater willowherb, mugwort *Artemisia vulgaris*, creeping thistle, spear thistle, hedge woundwort *Stachys sylvatica* and meadow vetchling *Lathyrus pratensis*, in addition to hard rush and common grasses including false oat-grass *Arrhenatherum elatius*, tufted hair-grass and cock's-foot *Dactylis glomerata*.

These areas meet the UKHab criteria of 'h3h – mixed scrub'.

3.2.5 Scattered Trees

Scattered trees/ lines of trees are present throughout the site, including several mature specimens. These include:

- Trees within and along the boundaries of the various grazed fields throughout the site, with species including poplar, ash, pedunculate oak, willow, hawthorn and horse chestnut. Ages varies, with several mature specimens noted.
- Several trees set upon amenity grassland/ improved grassland in the southeast corner of the site, mostly semi-mature, with species including poplar, ash, silver birch, maple *Acer spp.*, common lime and cherry.
- Mostly under-mature to semi-mature trees planted around the carparks and ancillary buildings between HMP Wymott and HMP Garth (mostly set on amenity grassland), predominantly maple, silver birch, common lime, hawthorn, cherry, common alder, Italian alder *Alnus cordata* and common hornbeam *Carpinus betulus*.
- Two stands of scattered trees immediately southeast of HMP Garth, set on amenity grassland and one stand surrounding pond P7 (TN18). Species include willow, alder, elder, silver birch and ash, and ages are typically young to semi-mature.

All of these trees meet the UKHab criteria 'w1g6 – line of trees'.

3.2.6 Marshy Grassland

A field of marshy grassland is present at the western extent of the site, between HMP Garth and Stanning's Folly. Soft rush is dominant, with frequent hard rush *Juncus inflexus*, Yorkshire-fog *Holcus lanatus*, creeping bent *Agrostis stolonifera* and perennial rye-grass *Lolium perenne*, occasional false oat-grass *Arrhenatherum elatius*, broad-leaved dock, sharp-flowered rush *Juncus acutiflorus*, creeping buttercup *Ranunculus repens* and greater willowherb *Epilobium hirsutum*, and rare occurrences of white clover *Trifolium repens* and spear thistle *Cirsium vulgare*.

This area meets the UKHab criteria of 'g3c8 – Holcus-Juncus neutral grassland'.

3.2.7 Improved Grassland

Improved grassland constitutes a large proportion of the site and is intensively managed throughout.

Four large fields in the south are mostly grazed by sheep (with one cut for silage). The improved grassland across these fields is dominated by perennial rye-grass, with frequent Timothy-grass

*Phleum pratense*, white clover, Yorkshire-fog and broad-leaved dock, and occasional annual meadow-grass *Poa annua*, false oat-grass and creeping buttercup. Soft rush is frequent present within the western-most field only.

A series of fields surrounding farm buildings at the northeast extent of the site are intensively grazed by sheep, pigs and horses. The sward height is extremely short in these areas with bare ground in some places. These fields are dominated by perennial rye-grass, with frequent Yorkshire-fog and annual meadow-grass, and occasional creeping thistle *Cirsium arvense*, common nettle and broad-leaved dock, and rare instances of common mouse-ear *Cerastium fontanum*.

Approximately nine other fields are present in the areas immediately surrounding HMP Garth/ HMP Wymott. Many of these are grazed by sheep and have a similar species composition to those found in the south, with occurrences of soft rush and hard rush occasional across most of these fields.

These areas all meet the UKHab criteria of 'g4 – modified grassland'.

3.2.8 Poor Semi-Improved Grassland

Narrow strips of poor semi-improved grassland are present along a small number of the fences bounding the fields of improved grassland on the site – notably along the southeast boundary – although intensive management throughout the site means this habitat is rare. Grass species predominantly include false oat-grass, cock's-foot, Yorkshire-fog and perennial rye-grass, with herbaceous species typical of those found within the fields.

These areas meet the UKHab criteria of 'g3c – other neutral grassland'.

3.2.9 Amenity Grassland

Amenity grassland, which has been mown to a very short sward-height, features throughout the site and predominantly in the carpark areas and surrounding ancillary buildings between HMP Garth and HMP Wymott. Several other isolated plots of amenity grassland are amongst planted trees in the southeast corner of the site, and constitute a bowling green in the northeast corner. This grassland typically contains common and widespread grasses such as perennial rye-grass, false-oat grass, Yorkshire-fog and annual meadow grass.

These areas meet the UKHab criteria of 'g4 – modified grassland'.

3.2.10 Open Water

Thirteen ponds were identified on the site itself; P6 to P18. P1 to P5, previously identified at the western extent of Stanning's Folly by Arcadis in 2018, were not in existence as distinct ponds at the time of the extended Phase 1 habitat survey and instead merged into the flooded woodland.

- P6 (TN11), P8 (TN35), P9 (TN9), P10 (TN8), P11 (TN10) and P12 (TN4) are all located within Stanning's Folly. These ponds are typically over-shaded by the surrounding trees and as a result feature limited aquatic and marginal vegetation, although most were covered with lesser duckweed *Lemna minor*. All of these ponds held water at the time of the survey; however, P10 (TN8) and P8 (TN35) held only a small volume and are almost certainly ephemeral.
- P7 (TN18) is located within an area of amenity grassland centrally within the site, between HMP Garth and HMP Wymott, fenced-off and directly surrounded by trees and tall ruderal vegetation including common nettle, creeping thistle, greater willowherb and broad-leaved dock.
- P13 (TN7) and P14 (TN5) are both situated within fields at the southern extent of the site, both sparsely surrounded by willow trees and containing occasional reedmace *Typha latifolia*.

P13 features soft rush throughout the margins and is protected by stock fencing, while P14 has mostly bare banks and evidences poaching by livestock.

- P15 (TN3) is located within a small stand of broadleaved semi-natural woodland immediately south of HMP Wymott. This pond is surrounded and over-shaded by hawthorn, willow and elder trees with no significant marginal or aquatic vegetation.
- P16 (TN14) lies within a belt of plantation woodland to the west of HMP Wymott. This pond contains a small volume of water – covered with lesser duckweed – and is fed by dry ditches at each end. Given the high degree of over-shading by trees, no significant aquatic or marginal vegetation is present.
- P17 (TN24), located immediately northeast of HMP Garth, is surrounded by willow trees to the south and is inundated with reedmace throughout the western half. Soft rush also features along the northern and eastern margins. Waterfowl were abundant on this pond, and the presence of fish cannot be ruled out.
- P18 (TN17) is situated within a belt of plantation woodland along the eastern edge of the site. This large pond has banks populated primarily with common grasses, in addition to soft rush, and is moderately over-shaded by trees.

These ponds meet the UKHab criteria of 'r1a6 – other eutrophic standing waters' and may qualify as 'pond (priority habitat)' (secondary code 19).

3.2.1 Running Water (Wet Ditches)

Several wet ditches feature throughout the site:

- A wet ditch lies between the plantation woodland and grazed pasture in the northeast portion of the site (TN29). This is predominantly over-shaded by trees but remains well-vegetated along the eastern banks by common nettle, creeping thistle, spear thistle, greater willowherb and meadowsweet *Filipendula ulmaria*, and along the western banks beneath the trees by bramble-dominated scrub. The channel is intermittently choked with reedmace and holds water throughout most of its length, eventually drying in the northern-most section.
- A series of ditches, some of which were holding water at the time of the extended Phase 1 habitat survey, are situated within improved grassland immediately east of HMP Garth (TN25) and which also connect with P17 (TN24). These are fairly well vegetated, with the vegetation choking the channel in many places. Species include common fleabane *Pulicaria dysenterica*, common hogweed, field mustard *Brassica rapa*, gypsy-wort *Lycopus europaeus*, common vetch *Vicia sativa*, bittersweet *Solanum dulcamara* and meadowsweet, with reedmace, soft rush, hard rush and reed sweet-grass *Glyceria maxima* dominating the channel in the southern-most portions. Occasional self-set ash, hawthorn and alder saplings are present in the eastern-most section. Only a small volume of water was present within these ditches at the time of the survey.
- Several more very short spans of wet ditches exist throughout the remainder of the site. One section, over-shaded by trees and containing some soft rush and reedmace, is situated south of HMP Garth (TN34). Two additional sections of wet ditch occur in the western portion of the site; one within Stanning's Folly which feeds P6 (TN11) and one to the west of HMP Garth, within the belt of plantation woodland.

These ditches meet the UKHab criteria of 'r2b – other rivers and streams'.

3.2.2 Dry Ditch

Several dry ditches feature throughout the site, some of which were found to be wet during the previous survey by Arcadis in 2019, but which were dry at the time of the current survey:

- A dry ditch is present along most of the northern edge of the site, set amongst plantation woodland. This is dry and predominantly bare. It becomes scrubbed over in the northeast corner of the site, along the edge of the grazed pasture fields.
- A series of dry ditches are present within fields immediately southwest of HMP Garth. These were mostly fringed by soft rush.
- A dry ditch bisects the belt of plantation woodland in centre of the site (TN13) and passes through P16 (TN14). Much of this is colonised with common nettle.
- Two further spans of dry ditch are interconnected with some of the wet ditches on the site, notably in the centre of the site (connected with TN34) and north of HMP Wymott (connected with TN29). Both are fairly well vegetated, with a similar species composition to that of TN24.
- A short span of dry ditch is present at the southern-most extent of the site, surrounded by pedunculate oak, ash, willow and hawthorn trees, and largely inundated with scrub and tall ruderal vegetation.

There is no applicable UKHab criteria for dry ditches.

3.2.3 Hedge with Trees

A defunct, species-poor hedgerow bounds the large field of improved grassland southwest of HMP Wymott, dominated by hawthorn and with occasional field maple *Acer campestre* and dog rose, and featuring a species-poor understorey. Two mature poplars are present within this hedgerow.

This hedgerow meets the UKHab criteria of 'h2a – hedgerow (priority habitat)'.

3.2.4 Defunct Hedge

A defunct hedgerow bounds a portion of the northeast corner of the site, running parallel with a dry ditch. Hawthorn is the dominant species, with occasional privet *Ligustrum spp.*, blackthorn and dog rose. The understorey contains mostly common nettle, cleaver *Gallium aparine* and bramble.

This hedgerow meets the UKHab criteria of 'h2a – hedgerow (priority habitat)'.

A defunct hedgerow borders the central prison carparks and contains abundant hawthorn and cherry laurel *Prunus laurocerasus*, with occasional dog rose and bramble. A managed cherry laurel hedgerow bounds the bowling green to the north of HMP Wymott. Leyland cypress *Cupressus* × *leylandii* hedging also surrounds a small carpark and picnic area south of HMP Garth.

These hedgerows meet the UKHab criteria of 'h2b – other hedgerows'.

3.2.5 Hardstanding/ Bare Ground

Various areas of hardstanding and bare ground feature throughout the site, and include:

- Staff/ visitor carparks and surrounding ancillary prison buildings in the central areas of the site, between HMP Wymott and HMP Garth, and to the north of HMP Wymott surrounding the bowling green.
- Areas of hardstanding and bare ground surrounding farm buildings in the southern-most and northeast portion of the site.
- Pathways surrounding the outer security fences of both prisons and the main access road leading through the southeast portion of the site.
- Single-track roads at the northwest extent of the site.

There is no applicable UKHab criteria for hardstanding.

### 3.2.6 Buildings

Over 20 buildings/ groups of building are present throughout the site, including:

- Ancillary prison buildings throughout the central areas of the site, of various sizes and constructions.
- A large livestock building in the south.
- A cluster of farm buildings in the northeast corner of the site.
- A building associated with the bowling green to the north of HMP Wymott.
- A large prison pump house/ stores building to the east of HMP Garth.

These buildings meet the UKHab criteria of 'u1b5 – buildings'.

### 3.2.7 Fence

Numerous stock-proof fences compartmentalise the fields on the site, border the farm tracks and mark the edges of the Stanning's Folly and the various belts of plantation woodland. Metal palisade fencing surrounds a small substation adjacent to the bowling green, in the northeast corner of the site.

High security fencing surrounds both HMP Garth and HMP Wymott.

These meet the UKHab criteria of 'u1e – built linear features'.

## 3.3 Species

### 3.3.1 Invertebrates

LERN returned a total of 87 records of invertebrates, both terrestrial and aquatic, within 2km of the site. Two species are listed on the LBAP; dark green fritillary butterfly *Argynnis aglaja* and a freshwater ribbon-worm species (Jenning's ribbon-worm) *Prostoma jenningsi* which is present within the Clay 'Ole (BHS) 821m north of the site (the only place in the world to support this species). Several moth species – dark-barred twin-spot carpet *Xanthorhoe ferrugata*, shaded broad-bar *Scotopteryx chenopodiata* and small phoenix *Ecliptopera silaceata* – were recorded on the southern edge of Stanning's Folly in 2012. This are listed a Lancashire Key Species.

The broadleaved semi-natural woodland and plantation woodland areas of the site all provide good suitability for an array of invertebrate species (including the aforementioned moth species), especially along the woodland edges, within deadwood and in mature trees. Wet and dry ditches, scrub and mature scattered trees throughout the remainder of the site could support a reasonably diverse population of common invertebrate species. The ponds on the site provide good suitability for a range of aquatic invertebrates, with P7 (TN18), P13 (TN7) and P17 (TN24) noted as being particularly good wildlife ponds. Jenning's ribbon-worm has only ever been recorded in the Clay 'Ole (BHS); therefore, it is considered unlikely this species occupies ponds on the site given its extremely specific requirements.

Several common and widespread species of butterfly were observed during the survey, including small white *Pieris rapae* and red admiral *Vanessa atalanta*.

### 3.3.2 Fish

LERN returned a total of 45 records of European eel *Anguillia anguillia* – a critically-endangered species – within 2km of the site. The nearest is from a pond at Ulnes Walton, adjacent to the site, recorded in 2006.

The presence of European eel on the site is unlikely given that many of the ponds and ditches on the site are subject to frequent or occasional drying, and the variety and extent of aquatic vegetation is poor throughout all ponds.

### 3.3.3 Amphibians

According to MAGIC, three EPS licences have been obtained for great crested newt (GCN) *Triturus cristatus* within 2km of the site:

- EPS2011-3387: licence to destroy the resting place of GCN for a site approximately 1.32km east (02/07/2013 to 31/10/2013).
- EPSM2010-2283: licence to destroy the resting place of GCN for a site approximately 1.01km southwest (05/10/2010 to 30/04/2011).
- EPSM2013-6287: licence to destroy the resting place of GCN for a site approximately 2.00km west (22/10/2013 to 30/06/2020).

LERN returned of total of 147 records of amphibian species with 2km of the site, 60 of which are for GCN and the remainder of which are smooth newt *Lissotriton vulgaris*, common toad *Bufo bufo*, common frog *Rana temporaria* and palmate newt *Lissotriton helveticus*. Small and medium populations of GCN (in addition to populations of other widespread amphibian species) have been recorded in receptor ponds in the southern portion Ulnes Walton (BHS), which is the area immediately adjacent to the northwest of the site (east of TN21). These have been recorded as recently as 2006. Populations of GCN, smooth newt and common toad have all been recorded in a series of water treatment ponds 830m east of the site, with records originating from 2004 and 2007. There are additional records of GCN in ponds and on terrestrial habitats to the southwest,

as near as 175m to the site and recorded in 1996 and 2003; however, it is uncertain whether the ponds are still in existence.

Thirteen ponds (P6 to P18) were identified upon the site itself. HSI assessments were made of P6 to P18 at the time of the extended Phase 1 habitat survey, the results of which are summarised in Table 3.2. P1 to P5 were not defined ponds at the time of the survey; rather merged into a large area of wet/ flooded woodland. These ponds were therefore not subject to an HSI.

**Table 3.2: Habitat Suitability Index (HSHI) Assessments for P6 to P18**

| Pond | HSI Value | Suitability for GCN |
|---|---|---|
| P6 | 0.74 | Good |
| P7 | 0.72 | Good |
| P8 | 0.46 | Poor |
| P9 | 0.69 | Average |
| P10 | 0.70 | Good |
| P11 | 0.66 | Average |
| P12 | 0.73 | Good |
| P13 | 0.77 | Good |
| P14 | 0.66 | Average |
| P15 | 0.70 | Good |
| P16 | 0.55 | Below average |
| P17 | 0.64 | Average |
| P18 | 0.76 | Good |

In addition to the ponds identified upon the site itself, there are a further 39 potential ponds within 500m of the site, in addition to several drains, which may be suitable for GCN. The cluster of ponds at Ulnes Walton adjacent to the site are known to support GCN and other amphibians.

GCN make use of breeding ponds during the breeding season (March to June inclusive) and at other times of year may be present in suitable terrestrial habitats up to 500m from breeding ponds.

Suitable terrestrial habitat for GCN is present within the site, notably woodland, hedgerows, scrub, dry ditches, marshy grassland and small amount of semi-improved grassland which provide shelter and foraging habitat for GCN and other widespread amphibian species. Numerous potential hibernacula are present throughout the woodland areas of the site, including log piles which are especially frequent in the belt of plantation woodland along the northern edge of the site, and a fallen dead tree to the east of HMP Garth (TN26). Areas of hardstanding, amenity grassland and grazed improved grassland habitats are considered to provide sub-optimal habitat for GCN/ amphibians, particularly in the northeast corner of the site and in the south.

Signage throughout the site (such as in Stanning's Folly and next to P7) would indicate the presence of GCN on the site. Given the known presence of GCN in ponds at Ulnes Walton adjacent to the site, it is considered likely that this species is present on the site and uses both aquatic and terrestrial habitats. It is likely that common other common and widespread species of amphibian are also present on the site.

### 3.3.4 Reptiles

LERN did not return any records of reptile species within 2km of the site.

Habitat suitable for supporting populations of grass snake *Natrix helvetica* and slow-worm *Anguis fragilis* are present on the site, predominantly areas of scrub, marshy grassland, ditches, ponds and woodland edge habitats. Potential hibernacula are present on the site, including log piles which are especially frequent in the belt of plantation woodland along the northern edge of the site, and a fallen dead tree to the east of HMP Garth (TN26). The improved grassland within the main body of grazed fields in the south and the northeast, along with central carpark areas between HMP Garth and HMP Wymott, are subject to high levels of disturbance and considered unlikely to support permanent reptile populations.

### 3.3.5 Birds

LRERC returned numerous records of birds within 2km of the site and suitable habitat is present at the site for the following species: barn owl, kestrel *Falco tinnunculus*, sparrowhawk *Accipiter nisus*, little owl *Athene noctua*, tawny owl *Strix aluco*, grey heron *Ardea cinerea*, goldfinch *Carduelis carduelis*, greenfinch *Chloris chloris*, treecreeper *Certhia familiaris*, blue tit *Cyanistes caeruleus*, cuckoo *Cuculus canorus*, reed bunting *Emberiza schoeniclus*, grey wagtail *Motacilla cinerea*, robin *Erithacus rubecula*, linnet *Linaria cannabina*, willow warbler *Phylloscopus trochilus*, coot *Fulica atra*, Lapwing *Vanellus vanellus* and Jack snipe *Lymnocryptes minimus*.

No evidence was found indicating use of the site by roosting or breeding barn owl(s); however, several trees within and around the various woodland areas on the site provide potential roosting and nesting opportunities for barn owl and other birds of prey, such as kestrel. Several of the open buildings on the site also provide potential nesting/ roosting opportunities for these species, notably farm buildings to the south and northeast, and a large disused building in the centre of Stanning's Folly.

The area of marshy grassland on the site has potential to support smaller populations of ground nesting birds or over-wintering birds and oystercatcher *Haematopus ostralegus* and snipe *Gallinago gallinago* were observed in this field (and in the adjacent improved grassland field west of HMP Garth) during the survey by Arcadis in 2019.

Suitable nesting habitat for common passerine bird species were identified throughout the site, especially the woodland, and also in the trees, scrub and hedgerows, with numerous disused bird nests found in such areas.

### 3.3.6 Bats

According to MAGIC, one EPS licence has been obtained for bats within 2km of the site:

- 2015-10598-EPS-MIT: licence to destroy the resting place of common pipistrelle *Pipistrellus pipistrellus* for a site, within 100m to the south (27/05/2015 to 25/05/2020).

No statutory designated sites with bats as an important feature were identified within a 10km radius of the site.

LERN returned of total of 53 records of bats with 2km of the site, with the majority of records comprising common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus,* with two records of brown long-eared bat *Plecotus auritus*, and four records of Myotis bat species, including Brandt's bat *Myotis brandtii* and Daubenton's bat *Myotis daubentonii*. Several bat casualties have been recorded on the site (at HMP Wymott) between 1994 and 2019, with species including Brandt's bat, Daubenton's bat, common pipistrelle and soprano pipistrelle. A maternity roost of common pipistrelle was recorded in a reception/ welcome building on the site, located between the two prisons, in 2009 and 2010 (TN36). Records suggest a different pipistrelle roost originating from the south of the site, recorded in 1992; however, the exact location(s) of these are unclear. The nearest recorded off-site roost is a common pipistrelle day roost in farm buildings 50m southeast.

Eight buildings on the site provide bat roosting potential:

- The reception building (TN36) provides high bat roosting potential, given that it is understood to have supported a maternity pipistrelle roost ten years ago. Given the age of the data, it should not be assumed to be a confirmed roost.
- A brick-built, flat roofed former agricultural building south of HMP Garth provides low bat roosting potential (TN12).
- The building adjacent to the bowling green in the northeast corner of the site provides low bat roosting potential, owing to gaps in the timber cladding on the eastern elevation (TN16).
- Brick barns in the northeast corner of the site provide negligible-to-low bat roosting potential, by virtue of mortar gaps on the northern gable (TN32).
- Four timber-built stables in the northeast corner of the site, open in structure but with bitumen-lined roofs, all provide negligible-to-low bat roosting potential (TN31).

Numerous trees upon or directly adjacent to the site provide bat roosting potential:

- Three ash trees at TN15, two trees adjacent to P18 (TN17) and trees TN20, TN23, TN27 and TN30 provide low bat roosting potential.
- Trees TN6 and TN19 provide moderate bat roosting potential.
- Several other trees within the areas of semi-natural and plantation woodland throughout the site provide low and moderate bat roosting potential. Notable examples included mature poplars along the southwest edge of Stanning's Folly and a standing dead tree adjacent to P8 (TN35).

The network of hedgerows, ponds, ditches, woodland, grassland and scrub habitats across the site are likely to provide opportunities for foraging and commuting bats as part of the wider foraging resources in the locality.

### 3.3.7 Badger

LERN do not provide badger records. Lancashire Badger Group were not contacted for any further information in this instance.

One badger sett was identified on the site:

- An active outlier sett (Sett 1) is located within Stanning's Folly, near to the derelict building and P8 (TN35). Sett 1 features 5 entrances (facing in various directions) which are situated at the base of a fallen tree. Two of the entrances displayed signs indicating current use by badger(s), with badger hair found in the entrance and polished soil in the base/ sides of the tunnels. Several badger snuffle holes were noted in the locality. Evidence of use by rabbit *Oryctolagus cuniculus* (droppings and hair) was also identified. The levels of badger activity at this sett were relatively low at the time of the extended Phase 1 habitat survey.

The flooded/ wet area of woodland constituting the western portion of Stanning's Folly features unsuitable ground conditions for sett building.

No other notable badger field signs were observed anywhere else throughout the site. Numerous field signs (and sightings of) roe deer *Capreolus capreolus* were made within Stanning's Folly and the adjacent areas of plantation woodland. It is plausible that badgers may use the same established paths as the deer through these areas of woodland.

### 3.3.8 Water Vole

LERN returned 12 records of water vole within 2km of the site. The nearest records originate from a fishing pool and a small adjacent pond in Ulnes Walton (BHS), adjacent to the northern portion of the site, recorded in 1999 and 2000.

There are several wet ditches and ponds throughout the site which provide differing levels of suitability for water vole:

- The wet ditch that lies between the plantation woodland and grazed pasture in the northeast portion of the site (TN29) is partially over-shaded by trees and, as a result, ground flora along the western bank is species-poor and dominated by bramble. Tall herbs are present along the eastern bank, which provides adequate cover for water vole. The diversity of food plants is poor, however. The southern portion held water at the time of the extended Phase 1 habitat survey, but this dries at the northern end. Himalayan balsam, an Invasive Non-Native Species (INNS), is also present at the northern end. The banks are suitable for burrowing. This ditch is considered to provide marginal suitability for water vole.
- The series of ditches situated within improved grassland immediately east of HMP Garth (TN25) are fairly well vegetated, although current management restricts the width of bankside vegetation to below two metres each side and is likely to create moderate levels of disturbance. Only a small volume of water was present within these ditches at the time of the Ramboll survey; however, a greater volume of water was observed by Arcadis in 2019. Overall, bankside vegetation and the variety of potential food plants is good (although occasional Himalayan balsam was noted), and the banks are suitable for burrowing. These ditches are considered to provide marginal suitability for water vole.
- P17 and the short section of adjoined ditch (TN24) contains extensive open water and an abundance of suitable food plants (predominantly soft rush), with patchy bankside vegetation creating a moderate degree of cover. The banks are mostly shallow-sloping and therefore have only partial suitability for burrowing. The pond and ditch are considered to provide marginal suitability for water vole.
- Several short spans of wet ditches at TN34, within plantation woodland south of HMP Garth which feeds P6 (TN11) and within plantation woodland to the west are all considered sub-optimal for water vole, given the very low volume of water and minimal bankside and aquatic vegetation due to over-shading by trees, limiting cover and food availability. These ditches are therefore considered sub-optimal for water vole.

Remaining ponds on the site are considered unsuitable for water vole due to either lack bankside and aquatic vegetation, poaching or damage by livestock, levels of disturbance, lack of permanent water present (ephemeral) and/ or poor connectivity to the wider landscape/ other suitable water vole habitat. Several ditches identified as providing suitability water vole by Arcadis in 2019 (undertaken in February when water levels are likely to be high) were found to be dry at the time of the Ramboll survey and are therefore considered unsuitable for water vole.

No obvious evidence of water vole was noted from accessible banks of the wet ditches/ ponds during the survey; however, a comprehensive water vole survey was not undertaken.

It is considered possible that this species is present on the site, especially at TN24, TN25 and TN29; closest to where this species has previously been recorded at Ulnes Walton (BHS).

### 3.3.9 Otter

LERN returned five records of otter within 2km of the site, all of which originate from Wymott Brood from locations 735m and 1230m southwest of the site, respectively, recorded between 2010 and 2014.

The wet ditches and ponds throughout the site are generally sub-optimal for otter(s) given their moderate to high degrees of disturbance, relatively small sizes and likely absence of fish throughout the majority. No significant opportunities for holt-building were identified within or around these features.

It is, however, possible that this species utilises Stanning's Folly and other belts of plantation woodland, particularly in the north and west of the site, as 'dark corridors' for commuting around the wider landscape. Wymott Brook passes a short distance northwest of the site and several large fishing pools exist in the local area, including at Ulnes Walton (BHS). Otter fencing around the largest pool at Ulnes Walton may be anecdotal evidence of the presence of otter(s) in the immediate area.

Although otters are considered unlikely to be permanently present on the site, it is possible that this species is an occasional visitor.

3.3.10 Hazel dormouse

LERN did not return any records of hazel dormouse within 2km of the site.

Stanning's Folly provides suitability for hazel dormouse, given the diverse age structure, the presence of a shrub layer in some areas and good connectivity with on-site and off-site areas of dense scrub and small areas of woodland (to the south and west). Areas of plantation woodland in the north of the site also provide suitability for dormouse, as well as providing a potential corridor between Stanning's Folly and scrub/ woodland habitats associated with/ adjacent to Ulnes Walton (BHS). However, there are no other, significant areas of woodland in the surrounding landscape.

The distribution of hazel dormouse is such that occurrences in Lancashire are extremely rare and no evidence of dormouse was observed during the extended Phase 1 habitat survey. However, given the extent of habitats suitable for dormouse on the site, the presence of this species on the site cannot be ruled out.

3.3.11 Hedgehog

LERN returned nine records of hedgehog within 2km of the site, the nearest of which originate approximately 850m north of the site, recorded in 2010.

The site contains suitable habitat for hedgehogs throughout, most notably extensive woodland, hedgerows and scrub, with log piles throughout the woodland (particularly plantation woodland in the north) providing good potential refuge and hibernation opportunities. Short-sward, improved grassland in the northeast and south provides good opportunities for foraging.

3.3.12 Invasive Species

LERN returned records for a number Invasive Non-Native Species (INNS) within 2km of the site. Some of those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) include Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum* and montbretia *Crocosmia x crocosmiiflora*.

Himalayan balsam was widespread throughout the site, notably in ditches at TN25 and TN29, near to P15 (TN3), on the edge of plantation woodland to the southeast (TN33) and bounding roads at the north-western-most areas of the site (TN21 and TN22).

Unidentified species of cotoneaster *Cotoneaster spp.* were found on the site, at TN37, and adjacent to ponds at TN17 and TN18. Some species of non-native cotoneaster are listed on Schedule 9.

Cherry laurel was recorded in two defunct hedgerows; surrounding the bowling green and bounding a prison carpark. Whilst not listed on Schedule 9, Cherry Laurel is non-native and can be invasive and a threat to native flora.

### 3.3.13 Assessment of Important of Ecological Features

Table 3.3 presents the ecological importance of habitats present on the site, in accordance with CIEEM guidance. A preliminary assessment of the importance of the site for fauna is also included.

**Table 3.3: Ecological Importance of Features Present on the Site (in accordance with CIEEM Guidelines)**

| Feature | Ecological Importance | Rationale |
|---|---|---|
| Broadleaved Semi-Natural Woodland | Local level | Stanning's Folly has a good age range and structural diversity, with a good assemblage of broadleaved tree species and developed shrub layer. Western portion is wet woodland and several ponds present in the eastern portion. Diversity of ground flora variable but generally poor. Deadwood and log piles present. Likely to be of high value to amphibians, bats, invertebrates, reptiles and nesting birds, also with opportunity for dormouse. May be used by commuting otter(s), although no field signs were found. Contributes to the biodiversity value of the site.<br>Broadleaved and mixed woodland are listed as Lancashire BAP habitats. |
| Scattered Trees | Local level | Various ages, with several mature specimens, predominantly native species. Several scattered trees provide roosting potential for bats and nesting/ foraging opportunities for passerine birds. Deadwood/ rot may provide opportunities for common invertebrates. |
| Dense/ Scattered Scrub | Site level | Widespread and easily-replaced habitat. Provides habitat for birds, amphibians, reptiles and invertebrates. |
| Marshy Grassland | Local level | Contains a relatively low diversity of plant species and is dominated by common species, but with a varying sward height. Likely to provide habitat for reptiles, amphibians, foraging birds of prey and a reasonably diverse assemblage of invertebrates. Likely to support small populations of ground nesting or over-wintering birds. Contributes to the biodiversity value of the site. |
| Improved Grassland | Site level | Widespread and easily-replaced habitat. Provides habitat for birds, amphibians, reptiles and common invertebrates. Provides potential foraging habitat for hedgehog. |
| Poor Semi-Improved Grassland | Site level | Widespread and easily-replaced habitat and contains a low diversity of herbs and grasses. May provide foraging opportunities for birds of prey and further opportunities for reptiles, amphibians and common invertebrates. |
| Amenity Grassland | Site level | Widespread and easily-replaced habitat, heavily mown and of low species diversity. |

| Table 3.3: Ecological Importance of Features Present on the Site (in accordance with CIEEM Guidelines) | | |
|---|---|---|
| Open Water | Local level | Thirteen ponds across the site have varying suitability for GCN (seven have good suitability) and other common/ widepsread amphibians. P17 has marginal suitability for water vole. All provide suitability for common assemblages of invertebrates. Unlikely to support European eel. |
| Runing Water (Wet Ditches) | Site level | Some wet ditches on the site have marginal suitability for water vole. Over-shaded/ woodland wet ditches are unsutiable. Also suitable for a common assemblage of invertebrates. Unlikely to support Eurpean eel. Contribute to the biodiversity value of the site. |
| Dry Ditches | Site level | Dry ditches on the site are unsutiable for water vole, but do provide potential ecological corridors for other species and good suitability for invertebrates. |
| Hedgerows | Local level | Hedgerows on the site are all defunct and species-poor. However, some meet the criteria of priority habitat. They provide potential corridors and habitat links, as well as commuting and foraging habitat for bats, and good opportunities for nesting birds, hedgehogs and amphibians. |
| Buildings | Site level | Whilst the buildings do not significantly contribute to the ecological importance of the site, eight buildings provide varying degrees of bat roosting potential. |
| Invertebrates | Site level | The woodland, trees, scrub, hedgerows, grassland habitats, ditches and ponds are likely to provide suitability for a common assemblage of invertebrates. |
| Fish | Negligible | The ponds and ditches on the site are unlikely to support European Eel due to regular fluctuations in water levels and lack of aquatic vegetation. |
| Great Crested Newt/ Other Amphibians | Local level | Seven ponds on the site have good suitability for GCN and other on-site ponds provide poor to average suitability. A further 38 ponds within 500m of the site may also support GCN. There are records of GCN from ponds adjacent to the site, at Ulnes Walton (BHS) and signage on the site suggests the presence of this species, although further survey is required to confirm this. GCN are likely to use terrestrial and aquatic habitats on site. |
| Reptiles | Site level | The site contains habitats capable of supporting populations of common reptiles, notably scrub, grassland, hedgerows, ponds, ditches and woodland edge habitats, although no reptiles have previously been recorded in the local area. The status of reptiles on site is not known; however, site level importance is estimated at this stage, although further survey is required to confirm this. |

| Table 3.3: Ecological Importance of Features Present on the Site (in accordance with CIEEM Guidelines) | | |
|---|---|---|
| Birds | Local Level | The woodland, scattered trees and open farm buildings on the site have some potential to support birds of prey/owls for roosting and nesting, and foraging habitat exists throughout the site; however, no evidence of these species was found. Woodland, hedgerows, scattered trees and scrub habitats provide nesting and foraging opportunities for passerine bird species. Marshy grassland is likely to support small populations of ground nesting or over-wintering birds (snipe and oystercatcher were previously recorded on the site by Arcadis in 2019). |
| Bats | Local level | Eight buildings and numerous trees (many of which are within areas of semi-natural and plantation woodland) throughout the site provide potential for roosting bats. A maternity roost of common pipistrelles has previously been recorded in a building on the site 10 years ago and seven other buildings on the site provide bat roosting potential. The network of hedgerows, woodland, ditches, ponds and scrub habitats throughout the site are likely to be used by bats for foraging and commuting, potentially between roosting sites on the site and in the local area. |
| Badger | Site level | A single outlier sett (Sett 1) was identified in Stanning's Folly. This was active but evidences low levels of badger use. No other evidence of this species was found anywhere throughout the remainder of the site. |
| Water Vole | Site Level | No evidence of water vole was identified at the site; however, Several wet ditches and P17 provide marginal suitability for this species. Dry ditches and other ponds are unsuitable or sub-optimal. Water voles have been recorded adjacent to the site, at Ulnes Walton (BHS). The status of water vole on the site is not known; however, site level importance is estimated given the extent of suitable habitat on the site, although further survey would be required to confirm this. |
| Otter | Negligible | Habitats on the site are considered unlikely to support this species permanently, and no field signs were noted. However, it is possible that otter(s) could use Stanning's Folly to commute through the wider landscape. |
| Hazel Dormouse | Negligible | Woodland (Stanning's Folly and areas of plantation woodland in the north), hedgerow and scrub habitats are of good suitability. However, no records of hazel dormouse were obtained from the surrounding area, this species is locally very rare and no evidence of dormouse was found during the survey. It is possible that this species is present, although further survey would be required to confirm this. |

| **Table 3.3: Ecological Importance of Features Present on the Site (in accordance with CIEEM Guidelines)** | | |
|---|---|---|
| Hedgehog | Site level | Scrub, woodland, hedgerows and grassland habitats provide refuge and foraging opportunities for this species, and there are records in the local area. |

# 4. ECOLOGICAL CONSTRAINTS AND RECOMMENDATIONS

This section collates the information gained during the desk study and extended Phase 1 habitat survey, presents potential ecological constraints and makes recommendations for mitigation. It has been prepared in view of the construction of a prison at the site but has not been based on any specific designs at this stage, other than initial proposals. It is not yet known to Ramboll when the proposed development will commence.

## 4.1 Statutory Designated Sites

No statutory designated sites were identified within 2km of the site; therefore, no direct or indirect impacts upon such designations are anticipated.

## 4.2 Non-Statutory Designated Sites

Ulnes Walton (BHS) lies adjacent to the northwest portion of the site and is well-connected. At this distance, direct and indirect construction impacts are likely (depending upon the exact location of the development footprint, once confirmed). A Construction Environmental Management Plan (CEMP) should be produced to include measures to protect this BHS site, such as preventing contaminated run-off causing siltation to the ponds/ pools at Ulnes Walton and reducing dust during the construction phase. A suitably qualified Ecological Clerk of Works (ECoW) should input into the CEMP to ensure appropriate mitigation measures are in place to protect such sites.

Remaining non-statutory designations are situated beyond 700m from the site, a distance at which direct or indirect impacts resulting from the development are unlikely.

## 4.3 Habitats

The broadleaved woodland/ wet woodland, hedgerows, ponds, mature trees and marshy grassland on the site are ecologically valuable and potentially used by a range of fauna. Broadleaved and mixed woodland are listed as Lancashire BAP habitats, and Stanning's Folly is included on Natural England's PHI as deciduous woodland (MAGIC).

To minimize the impacts of any future development, it is recommended that these habitat types are retained wherever possible (and it is understood from initial proposals that the footprint of the new development will avoid Stanning's Folly). Re-creation of mature trees/ woodland habitats can take several years to achieve and may not fully mitigate the loss.

Development taking place in close vicinity to any retained vegetation/ features, such as trees, hedgerows and woodland, should include protection measures, including the provision of appropriate protective fencing to prevent trampling of vegetation or inundation by construction and excavated materials. The potential for temporary impacts can be controlled through a CEMP. This could include dust control measures to prevent construction dust impacting the retained habitats.

Construction works in the vicinity of existing trees and hedgerows to be retained could damage the trees or their roots, possibly leading to significant adverse impacts upon the trees (potentially premature death). Therefore, retained trees and hedgerows should be protected where possible during construction activities in accordance with BS 5837: 2012 'Trees in Relation to Design, Demolition and Construction' (for instance with fencing), in order to reduce the possibility of any damage, to both crown and roots of the trees.

It is recommended that a Biodiversity Net Gain (BNG) Assessment is undertaken at the earliest opportunity to assess if the development can achieve a net gain on site or whether off-site compensation is required. This is likely to be required before the planning authority will decide to grant planning permission and can take several months of negotiations. BNG is a process

whereby development leaves biodiversity in a better state than before and is a policy requirement under the National Planning Policy Framework (NPPF; 2019). BNG will soon become a legal requirement in England with the Environment Bill (2020) setting out a mandatory 10% net gain in biodiversity for new development. The BNG process is governed by a set of UK good practice principles (2016) along with industry guidance which outlines the practical implementation of the principles (2019). The key principle is the application of a mitigation hierarchy, which sets out that development should first avoid biodiverse habitats, then mitigate/minimise impacts upon habitats, then restore/reinstate habitats. As a last resort, once the mitigation hierarchy has been maximised on-site, the project may use biodiversity offsetting to compensate for any residual biodiversity impacts due to the project. The principles require use of a metric (e.g. Natural England metric v2.0) to assess and quantify net biodiversity change (the Warwickshire metric should no longer be used). Applying this process enables transparent reporting on biodiversity outputs to demonstrate delivery against the current policy requirement for BNG.

If there is a significant loss of habitats within the site and no opportunity to recreate habitats of value within the site compensation off-site will likely be required (because a biodiversity net gain is not achievable on site). This involves a financial contribution towards a compensation site within the district which allows a net gain in biodiversity units to be delivered offsite.

### 4.4 Invertebrates

If any hedgerows, ponds, ditches, woodland/ mature trees or areas of poor semi-improved grassland are removed, this could result in a negative effect on invertebrates. Wherever possible, it is recommended that these habitats are retained within the site boundary. Where this is not possible, new and enhanced planting should be included within the new development and surrounding MOJ land to replace any habitat removed by the development. This should include new, native hedgerow/ tree planting and wildflower grassland. Dead wood from mature trees should be retained with the new habitats. Additional log piles could be incorporated into areas of woodland where these features are more scare.

No further survey(s) in relation to invertebrates is required.

### 4.5 Fish

All ponds/ ditches on the site are considered unsuitable for European Eel, largely due to the fluctuating water levels and lack of suitable aquatic vegetation. The proposed development is therefore considered highly unlikely to negatively impact upon this species.

No further survey(s) or mitigation in relation to European eel (or any other fish species) is required.

### 4.6 Great Crested Newts and Other Amphibians

GCN and other, widespread amphibian species are likely to be present on the site both within ponds and within terrestrial habitats. There is potential for GCN/ amphibians to be killed, injured or disturbed if such habitats are removed.

There is currently no Natural England led District Licence scheme operating in Lancashire. The only mitigation option is therefore to apply for a Natural England Mitigation Licence, supported by a suitable mitigation strategy prior to habitat removal and the development of the site. This should be supported by up to date GCN survey data. No up to date GCN survey data exists for any ponds on the site or within a 500m ZOI to the knowledge of Ramboll. Further surveys of all ponds within a 500m radius of the site are therefore required.

Initially, four presence/ likely absence surveys or use of GCN eDNA techniques to determine presence or likely absence of GCN would be required for each pond. In ponds where GCN are present, a further two surveys (or six such surveys on ponds where eDNA techniques had been used) would need to be undertaken to determine population size class. GCN surveys can be undertaken between mid-March and mid-June, with half of the surveys in the peak season (usually mid-April to mid-May) using a combination of survey techniques (English Nature, 2001).

GCN mitigation, once the licence is granted, will likely require the site to be fenced with temporary amphibian fencing (TAF), followed by a trapping period (between 30 and 90 days – to be determined) and the translocation of GCN to a suitable receptor area. The suitable receptor area should seek to be within or adjacent to the site boundary and include new habitats with at least the same area to replace those habitats lost, including two new ponds for every pond that is lost, areas of rough grassland, scrub and hibernacula. The receptor site should maintain connectivity for GCN to migrate through the site to offsite habitats. New ponds should be created as early as possible so they may become established and able to accept the translocated population of GCN.

Given that ponds within the adjacent Ulnes Walton (BHS) have previously been used as receptor ponds for GCN translocations relating to the nearby landfill site, it may be possible to explore this as an option for translocation or to use an area of the Albatross & Razorbill site for pond creation, if required.

Mitigation for GCN will also serve to protected other, widespread amphibian species likely to be present upon the site.

## 4.7 Reptiles

The site provides suitability for common reptiles, especially throughout the ponds, ditches, hedgerows and scrub habitats. There is potential for reptiles to be killed or injured if such habitats are removed.

It is recommended that further reptile surveys are undertaken to determine the presence/ likely absence of reptiles on the site and inform mitigation. Reptile surveys can be undertaken between March and October inclusive, with April, May and September being the optimal months. Surveys would typically involve deployment of artificial refugia ($0.5m^2$ – $1m^2$ squares of sheet material) at minimum densities of 10 refuges per hectare. Reptile refugia would need to be deployed by a suitably experienced ecologist and subsequently checked for reptile presence on at least seven separate survey visits in accordance with best practice[14].

If reptiles are present on the site, a suitable mitigation strategy should be devised, which may include the retention of suitable habitat on the site, the creation of new habitat off-site and/ or reptile translocation.

## 4.8 Birds

Numerous opportunities for nesting passerine birds are present throughout various habitats across the site. Where hedgerow, scrub, woodland or tree removal is required in order to facilitate the proposals, any such works must be timed to occur outside of the bird nesting season (this is February – August inclusive). In the event that works are required within this time period then inspections for nests should be undertaken by a competent person immediately prior to the start of any works. Should any active nest be found, works shall cease and a minimum five metre buffer, appropriate marked, is to be formed until subsequent checks by an ecologist prove the absence of nesting birds.

[14] Gent, T. and Gibson, S. (2012). Herpetofauna Workers' Manual 2nd Edition. JNCC, Peterborough

Several trees within the woodland areas and scattered throughout the remainder of the site, along with open farm buildings, provide some roosting/ nesting potential for barn owl and other birds of prey, although no evidence of such species was found during the extended Phase 1 habitat survey. The grassland and scrub edge habitats provide some foraging opportunities for barn owl and other birds of prey, albeit limited due to the intensive management of the grassland throughout most of the site.

If significant areas of woodland require removal to facilitate the development, breeding bird surveys are recommended. These should be undertaken between mid-February and mid-July and typically involve three recording visits.

The marshy grassland and adjacent field are likely to support small populations of ground nesting birds and/ or over-wintering birds. To avoid the bird nesting season and wintering birds, vegetation clearance should be undertaken during September, where possible. If it is not possible to complete clearance works in one month, then remaining clearance works should be undertaken in the period October to March inclusive, but should avoid periods of prolonged freezing conditions when birds are more energetically stressed. All cut vegetation should be removed from the development site to avoid use by birds as nesting habitat.

### 4.9 Bats

One building on the site has been described as a maternity roost for common pipistrelle 10 years ago (and is therefore considered to provide high bat roosting potential as a current roost cannot be confirmed without further surveys, given the age of the data) and seven further buildings provide bat roosting potential. Further bat presence/ likely absence (emergence) surveys are required on any building which requires demolition/ alterations as part of the new development. Given the age of the data relating to the maternity roost (2009/ 2010), update surveys would be required on this building.

Numerous trees on/ adjacent to the site provide between low and moderate bat roosting potential, many of which are contained with woodland areas throughout the site. Trees with bat roosting potential should be retained, where possible. If any areas of woodland require clearance, a re-assessment by an ecologist should be undertaken to identify any trees which fall within the development footprint and require removal, and assign a level of bat roosting potential.

There is no further survey requirement for trees with low bat roosting potential, therefore a precautionary methodology must be adopted for any such trees which require felling or significant pruning to facilitate the new development. This may include soft-felling, undertaking felling/ pruning outside of the bat hibernation period (to minimise significant disturbance) and carrying out felling/ pruning under supervision of a suitably licenced ecologist. Bat box provision is recommended to provide roosting opportunities for bats in areas where trees have been felled.

Tree(s) with moderate bat roosting potential and which require removal to facilitate the new development should be subject to further bat presence/ likely absence surveys (an aerial assessment using an endoscope or re-entry surveys are recommended for trees with moderate value).

Bat emergence/ re-entry surveys on trees/ buildings should be carried out between May and September inclusive and in accordance with best practice[15]. Survey effort is proportional to the degree of bat roosting potential afforded to any given building/ tree:

- Low bat roosting potential requires a minimum of one emergence survey (for buildings) but no further survey for trees (although structures with low roosting potential should be judged on a case-by-case basis).

[15] Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust (BCT).

- Moderate bat roosting potential requires a minimum of two emergence/ re-entry surveys.
- High bat roosting potential requires a minimum of three emergence/ re-entry surveys.

If roosting bats are found to be present, further roost characterisation surveys may be required.

These will ascertain the presence or likely absence of roosting bats and, if present, the number and species of bat(s), roost location(s) and ingress/ egress point(s). This will determine the requirement for a European Protected Species Licence (EPSL) from Natural England and inform mitigation. Additional roost characterisation surveys may also be required (unless sufficient information has already been collected during previous surveys).

The site provides good habitat for foraging and commuting bats and is relatively large in size. It is recommended that bat activity surveys are undertaken to fully understand the use of the site by foraging and commuting bats. These could comprise transect surveys, automated/ static activity surveys, or a combination of both methods. Given the size of the site and the degree of suitable habitats at the site, one survey visit per month (April to October inclusive) is recommended for transect surveys, which should be supplemented with data collected on five consecutive nights per month (April to October inclusive) using automated/ static detectors. This is in accordance with best practice[16]. It may be possible that a reduced scope is acceptable if the most highly valued bat habitats on the site can be retained and protected.

It is recommended in general that habitats where bats are most likely forage and commute, in particular the hedgerows, woodland, scrub and ditches, are maintained as dark areas at night, to retain foraging and commuting habitats around and through the site. New habitats should be created to compensate for loss of any hedgerows and trees within the site and to benefit invertebrates, which will increase the abundance of prey for foraging bats.

Potential impacts upon bats could arise from light spill onto retained habitats or potential roost locations, as well as light spill onto any new habitats created as part of the development. This could potentially cause disturbance to foraging, commuting and/ or roosting bats. The detailed lighting strategy for the site should therefore be devised to ensure that spillage of artificial light from buildings and external lights is minimised, whilst still taking account of the security and safety requirements of a prison development. In addition to complying with building regulations, the lighting scheme should be designed following guidelines from the BCT Bats and Lighting in the UK[17]. These include:

- Using low- or high-pressure sodium lights or LEDs instead of mercury or metal halide lamps, where possible, and avoiding the use of lamps greater than 150W;
- Directing lighting to where needed and avoiding spillage, including the use of hoods, cowls, shields etc. to avoid spillage onto areas of vegetation;
- Only lighting areas which need to be lit, and using the minimal level of lighting required to comply with building regulations; and
- Using movement sensors or timers on security lighting, where possible.

### 4.10 Badger

An active outlier sett (Sett 1) was identified within the centre of Stanning's Folly. No additional badger setts of field signs indicative of this species were found anywhere else throughout the site.

It is recommended that the development takes place a minimum of 30m from Sett 1, and this is considered easily achievable given the location of the sett. Safe stand-off areas should be created

[16] Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust (BCT).
[17] Bat Conservation Trust (2018) Bats Artificial Lighting in the UK. Guidance Note 08/18

under the supervision of an ECoW and be demarked using suitable fencing, raised 300mm off the ground to allow badger passage (although owing to the location of Sett 1, such fencing may not be required and installation of fencing protecting the woodland may be sufficient).

In the event this is not possible, a licence from Natural England will be required for any works that will disturb badgers or destroy/damage the badger sett(s). A licence can be applied for once planning permission is granted. One-way gates would be fitted to all sett entrances, and the sett(s) will subsequently be closed once badgers have been excluded. Closure of an outlier sett would not require the provision of an artificial sett.

Badgers can potentially establish new setts or re-open disused setts overnight. Regular checks by an Ecological Clerk of works (ECoW) are recommended prior to (pre-commencement) and during the development of the site.

It is considered that there is a risk of badgers becoming trapped in excavations during construction. To avoid such impacts, avoidance measures must be followed throughout the period of construction. These measures will form part of an ecological management plan or CEMP and shall include (but are not limited to) the following:

- All work will be undertaken during daylight hours and no artificial lighting is to be used;
- Excavation work and heavy machinery should be kept well away from where it could result in damage to the sett or disturbance to any badger occupying a sett;
- Fires and chemicals will not be used within 30m of any active sett;
- Access between setts and foraging/ watering areas must be maintained or new ones provided;
- Badger paths will not be blocked at any time;
- Any trenches will be covered at the end of each working day, or include a means of escape for any animal falling in;
- Any temporarily exposed open pipe system will be capped in such a way as to prevent badgers gaining access, as may happen when contractors are off site;
- Any dangers within the work site to badgers will be identified and reported to the ECoW; and
- No dogs to be taken onto the site by any of the workforce.

### 4.11 Water Vole

One pond and several ditches on the site are considered to have marginal suitability for water vole, and are well connected with areas in which this species has previously been recorded.

If any works are proposed within 6m of P17 and/ or ditches at TN25 and TN29, water vole surveys should be undertaken to determine the presence/ likely absence of this species. This should comprise an early season survey (May to June) and a late season survey (August to September), carried out in accordance with best practice guidelines[18].

If water voles are present on the site, a suitable mitigation strategy should be devised, which may include the retention and protection of ponds on the site, the creation of new habitat off-site and/ or water vole displacement.

[18] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Matthews and Paul Chanin. The Mammal Society, London.

### 4.12 Otter

The habitats upon the site are considered unlikely to support a permanent population of otter(s) and no signs indicating the presence of this species were observed during the extended Phase 1 survey. It is possible that otters may use the site for commuting; however, this would be predominantly within Stanning's Folly. The proposed development is therefore considered unlikely to negatively impact upon this species.

No further survey(s) or mitigation in relation to otter is required.

### 4.13 Hazel Dormouse

The woodland and scrub habitats upon the site, most notably Stanning's Folly, provide suitability for hazel dormouse, although no signs indicating the presence of this species were observed during the extended Phase 1 survey and the site falls outside the typical distribution for this species.

If these areas are to be affected by the proposed development, it is recommended that surveys to determine the status of hazel dormouse are carried out. If this species is found to be present on the site, mitigation would be required which would need to be devised to take account of the nature of the impact. A licence may be required from Natural England for any mitigation required.

### 4.14 Hedgehog

The woodland, hedgerows, scrub and grassland habitats on the site provide shelter and foraging opportunities for hedgehogs. Removal of hedgerows, woodland or scrub could directly kill or injure hedgehogs, if present. Foraging hedgehogs may also become trapped in excavations during construction.

To avoid these potential impacts, mitigation should include retention of suitable habitat, or careful removal of suitable habitat if retention is not possible. This may require the presence of an ecologist, depending on the scale of habitat removal. Site clearance should be undertaken between August and October, when hedgehogs are likely to be active and not breeding, and would also avoid the hibernation period. Other measures to protect hedgehogs would involve covering excavations, providing mammal ramps in excavations, and capping any open pipework. These measures should be implemented at the end of each working day and form part of an ecological management plan or CEMP.

No further survey(s) in relation to hedgehog is required.

### 4.15 Invasive Plants

Himalayan balsam was found throughout the site during the extended Phase 1 habitat survey, and several stands of unidentified cotoneaster species were also noted.

Once further details have been provided and the development footprint has been confirmed, it is recommended that an update survey is undertaken to map any invasive plants in areas which encompass or encroach into the footprint, to ascertain the presence and extent of INNS. This will then inform a suitable control or eradication strategy which should be implemented to prevent the spread of INNS.

In the event invasive plants are encountered during the course of the development, works in that area should halt immediately and an appropriate control or eradication strategy be implemented in consultation with an ecologist.

It is recommended that biosecurity protocols are adhered to during all construction activities, to prevent the spread of INNS onto the site. This should be detailed within a CEMP.

## 4.16 Enhancement

In order to comply with planning policy[19,20] , additional biodiversity enhancement measures could be provided on the site.

A landscape architect should be appointed to design an appropriate landscape scheme suitable for the purpose of the development. The new habitats should connect with habitats off-site and retained within the site boundary. Habitat removed by the development should be replicated elsewhere on the site, or potentially in the surrounding area.

Enhancement could include (but are not limited to) the following:

- Enhancement for invertebrate species through the provision of log piles or insect boxes ('bug hotels') within the landscape planting.
- Enhancement for birds and bats provided through the provision of bird boxes and bat boxes installed upon suitable trees or on existing buildings on the site which are to remain unaffected by the development.
- New, native hedgerow and tree planting and/ or enhancement of retained hedgerows.
- Enhancement of on-site woodland (including Stanning's Folly) which may require delivery of a Woodland Management Plan.
- Native wildflower seed mix application to areas of grassland within the landscape planting, to provide an additional foraging resource for pollinating bees and other insects.
- Consideration should be given to green infrastructure provision at the site, where feasible.
- Enhancement to retained ponds and ditches on the site and creation of new ponds.

[19] Department for Communities and Local Government, 2019. National Planning Policy Framework (NPPF). London. HMSO
[20] Defra, 2011. Natural Environment White Paper. The natural choice: securing the value of nature https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature

# 5. CONCLUSIONS

The extended Phase 1 habitat survey and desk study confirmed that the site is of nature conservation importance up to the Local Level and contains populations of, and potential for, protected species including reptiles, GCN/ amphibians, badger, bats, hedgehog, hazel dormouse and birds.

Table 5.1 summarises the recommendations and further survey requirements that should be implemented so that the development is in conformity with protected species legislation and planning regulations.

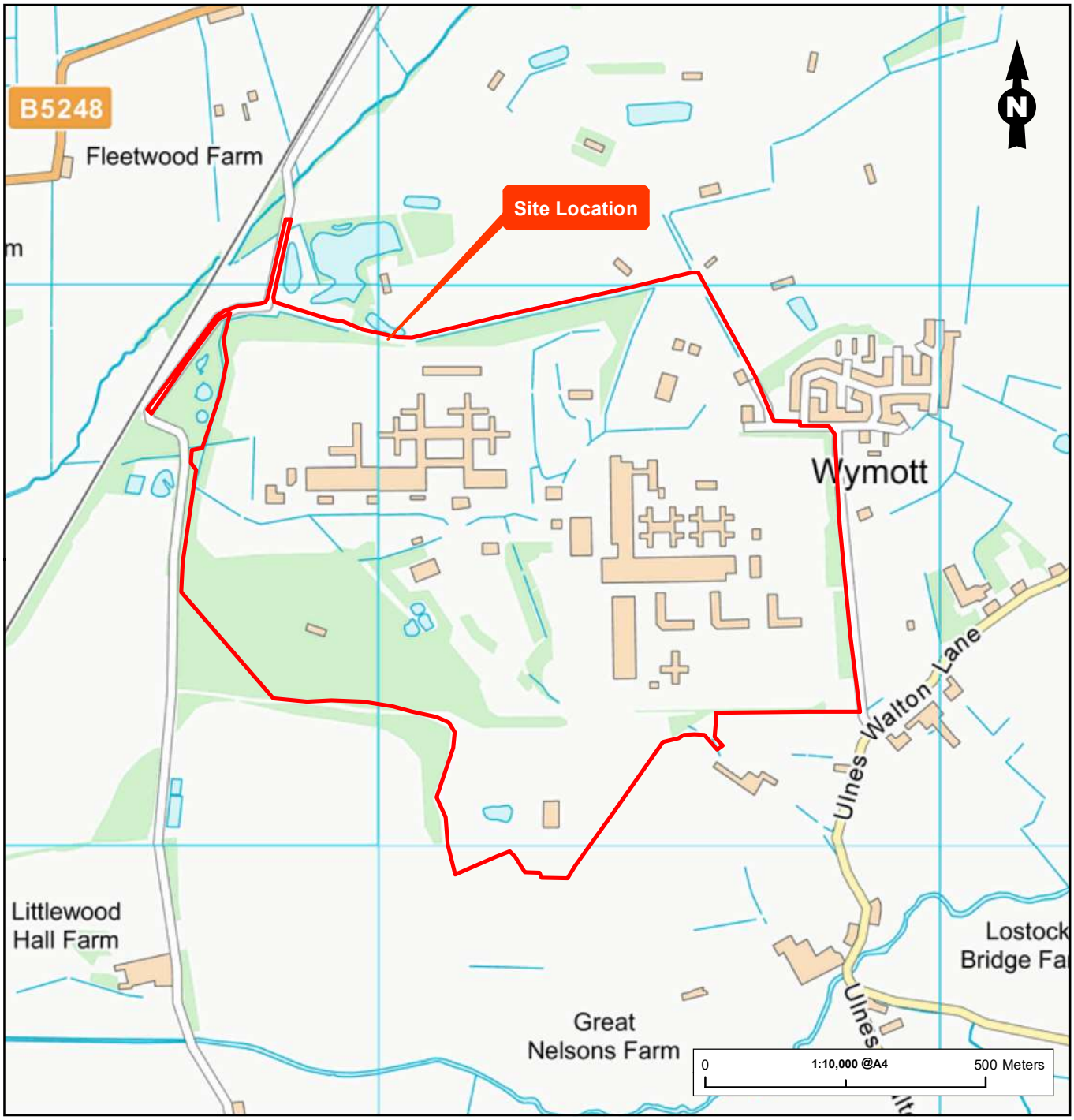
**Table 5.1: Summary of Recommendations**

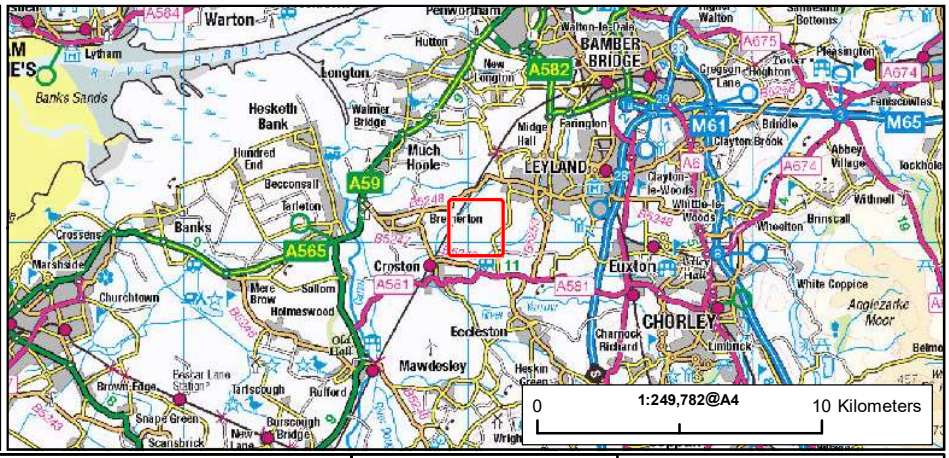
| Receptor | Recommendations | Timings |
|---|---|---|
| Designated Sites | A Construction Environmental Management Plan (CEMP) should be produced with input from a suitably-qualified Ecological Clerk of Works (ECoW), to ensure appropriate mitigation measures are in place to protect (non-statutory) designated sites. | Post-planning |
| Habitats | Ecologically valuable habitat types (including Stanning's Folly) should be retained, wherever possible, detailed within a master plan. | Pre-planning |
| | A landscape architect should be appointed to design an appropriate landscape scheme suitable for the purpose of the development, to include new native planting. | Pre-planning |
| | Retained trees and hedges should be protected where possible during construction activities in accordance with BS 5837:2012. | Pre-planning (surveys) and post-planning (implementation of protection measures) |
| | A CEMP should include control measures to prevent construction impacting upon retained habitats. | Post-planning |
| | It is recommended that a Biodiversity Net Gain (BNG) Assessment is undertaken. | Pre-planning |
| Invasive Plants | Survey of development footprint (when more detailed plans are provided) to ascertain status of Himalayan balsam and Cotoneaster in these areas. | Pre-planning |
| | Suitable control/ eradication strategy to be implemented based on survey results, and if INNS found to be present or encountered during construction then suitable measures to be taken. | Pre-planning/ post-planning |
| Invertebrates | Invertebrate habitats within the site boundary to be retained, where possible, or new replacement habitats created. | Pre-planning |
| | Invertebrate box ('insect hotel') provision as further enhancement. | Post-planning |
| Great Crested Newt/ Amphibians | Apply for a Natural England Mitigation Licence, supported by a suitable mitigation strategy prior to habitat removal and the development of the site. This should be supported by up to date survey data of ponds on the site and within a 500m ZOI. | Pre-planning (surveys) and post-planning (licence application) |

| Table 5.1: Summary of Recommendations | | |
|---|---|---|
| | New habitat creation will be required, which should include pond creation, with at least two new ponds for every pond removed (if GCN are present). | Pre-planning |
| Reptiles | Further presence/ likely absence reptile surveys to be undertaken. Mitigation may be required depending on survey findings. | Pre-planning |
| Birds | Breeding bird surveys recommended if any significant areas of woodland are to be impacted upon by the development. | Pre-planning |
| | Clearance of marshy grassland, if required, should ideally be undertaken during September to avoid potential small populations ground nesting and over-wintering birds. If this is not feasible, clearance should be undertaken in October to March but avoiding periods of prolonged freezing. Cut vegetation is to be removed from the site. | Post-planning |
| | Vegetation clearance on the wider site to be undertaken between outside of the bird nesting season or following checks by an experienced ecologist. | Post-planning |
| | Nest box provision as an enhancement for nesting birds. | Post-planning |
| Bats | Further bat presence/ likely absence surveys should be undertaken upon buildings with low to high suitability for bat roosting which will be lost/ impacted upon. | Pre-planning |
| | Trees with low bat roosting potential which will be lost/ impacted upon should be soft-felled under a precautionary methodology. Further bat presence/ likely absence surveys or an aerial inspection should be undertaken upon trees with moderate bat roosting potential which will be lost/ impacted upon. A walkover of any woodland to be removed, if required, should be undertaken once the development footprint is confirmed, to identify which trees will require removal. | Post planning (soft-felling) and pre-planning (surveys) |
| | Further bat activity surveys (transect or static/ automated) to be undertaken, the scope of which will be influenced by the development footprint. | Pre-planning |
| | Trees with low bat roosting potential which will be lost/ impacted upon to be felled while adopting to a precautionary methodology. | Pre-planning |
| | Retention of habitats providing the best bat foraging and commuting opportunities and maintenance as dark areas. | Pre-planning |
| | The lighting scheme should be designed following guidelines from the BCT Bats and Lighting in the UK. | Post-planning |
| | Bat box provision as an enhancement. | Post-planning |
| Badger | Regular (including pre-commencement) checks throughout the development. | Post-planning |
| | Creation of 30m stand-off areas around Sett 1 (in Stanning's Folly) to prevent damage/ destruction/ disturbance. If this is not possible a licence will be required from Natural England for works that will destroy or damage the badger sett (no requirement for artificial sett). | Post-planning |

| Table 5.1: Summary of Recommendations | | |
|---|---|---|
| | Adherence to avoidance measures during construction, to be included within a CEMP. | Post-planning |
| Water Vole | Presence/ likely absence water vole surveys to be undertaken if the development comes within 6m of those ponds/ ditches with suitability. Mitigation may be required depending on survey findings. | Pre-planning |
| Hazel Dormouse | Presence/ likely absence dormouse surveys to be undertaken if the development impacts upon significant woodland habitats on the site (notably Stanning's Folly). Mitigation may be required depending on survey findings. | Pre-planning |
| Hedgehog | Vegetation removal/ site clearance should be undertaken between August and October. Such activities may require supervision form an ecologist. | Post-planning |

# APPENDIX 1
# FIGURES

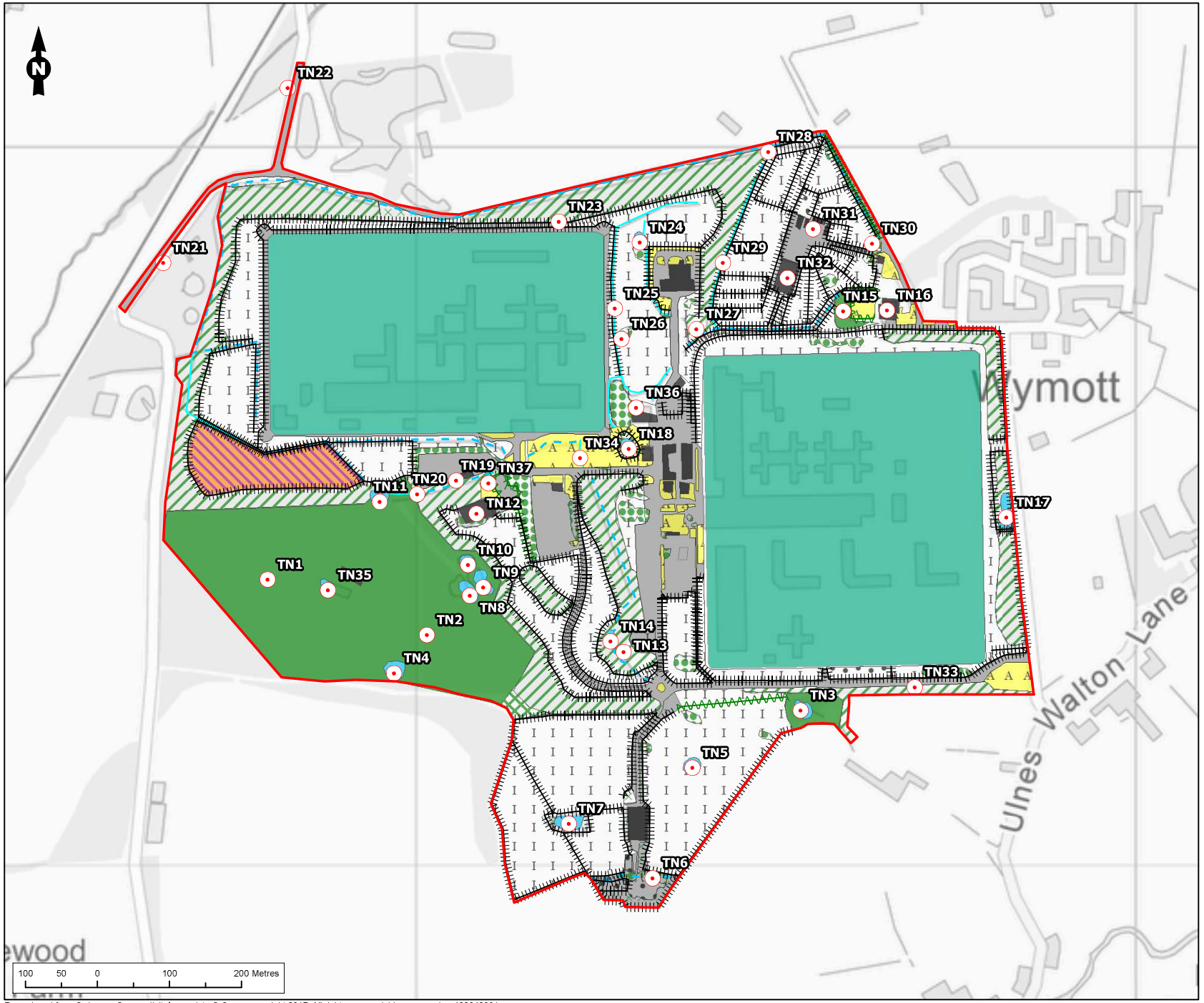



| | | | |
|---|---|---|---|
| Figure Title: Figure 1: Site Location - Albatross & Razorbill | Project Name: SE Prisons | Date: October 2020 | |
| | | Scale: As shown | |
| Project Number: 1620010134 | Client: Mace International UK limited | Issue: 1 | Prepared By: CF |



Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.






## Legend

- Site Boundary
- Target Note

**Phase 1 Survey**

- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A2.1 Scrub - dense/continuous
- A2.2 Scrub - scattered
- A3 Scattered trees
- B4 Improved grassland
- B5 Marsh/marshy grassland
- G1 Standing water
- J1.2 Cultivated/disturbed land - amenity grassland
- HS Hardstanding
- J3.6 Buildings
- J4 Bare ground
- NA Not accessed land
- J2.2.2 Defunct hedge - species-poor
- J2.4 Fence
- J2.6 Dry ditch
- J2.7 Wet ditch

Figure Title
Albatross & Razorbill Phase 1 Habitat

Project Name
SE Prisons

| Project Number | Figure No. |
|---|---|
| 1620010134 | 2 |
| **Date** | **Prepared By** |
| September 2020 | CF |
| **Scale** | **Issue** |
| 1:5,000 @A3 | 1 |

Client
**SE Prisons - Mace**

RAMBOLL

| Target Note | Description |
|---|---|
| **TN1** | Western half of Stanning's Folly, predominantly wet woodland which was flooded at the time of the extended Phase 1 habitat survey, and which contains several trees with bat roosting potential |
| **TN2** | Eastern half of Stanning's Folly, dry at the time of the extended Phase 1 habitat survey and containing several trees with bat roosting potential |
| **TN3** | A pond (P15) situated within a small stand of woodland and with several young Himalayan balsam *Impatiens glandulifera* plants on the southwest edge and providing good suitability for great crested newts (GCN) *Triturus cristatus* |
| **TN4** | A pond (P12) providing good suitability for GCN |
| **TN5** | A pond (P14) providing average suitability for GCN |
| **TN6** | Pedunculate oak *Quercus robur* tree overhanging dry ditch with moderate bat roosting potential |
| **TN7** | A pond (P13) providing good suitability for GCN |
| **TN8** | A pond (P10) providing good suitability for GCN |
| **TN9** | A pond (P9) providing average suitability for GCN |
| **TN10** | A pond (P11) providing average suitability for GCN |
| **TN11** | A pond (P6) providing good suitability for GCN |
| **TN12** | Former agricultural building with low roosting potential |
| **TN13** | Several trees within the plantation woodland provide low bat roosting potential |
| **TN14** | A pond (P16) providing below average suitability for GCN |
| **TN15** | Tree ash *Fraxinus excelsior* trees within the small stand of woodland provide low bat roosting potential |
| **TN16** | Large building adjacent to the bowling green provides low bat roosting potential |
| **TN17** | A pond (P18) providing good suitability for GCN, with two adjacent trees providing low bat roosting potential (a poplar *Populus spp.* and a crack willow *Salix fragilis*) and a small cotoneaster bush (of unidentified species) in the southwest corner |

| | |
|---|---|
| **Title:** Target Notes | **Client:** Mace |
| **Site:** Raven | **Date:** October 2020 |

| | |
|---|---|
| **TN18** | A pond (P7) providing good suitability for GCN and with a small stand of cotoneaster (of unidentified species) along the western edge |
| **TN19** | Mature pedunculate oak tree with moderate bat roosting potential |
| **TN20** | Mature pedunculate oak tree with moderate bat roosting potential |
| **TN21** | Himalayan balsam occurs frequently throughout the roadside vegetation |
| **TN22** | An extensive stand of Himalayan balsam adjacent to the road |
| **TN23** | Poplar tree on the southern edge of the plantation woodland providing low bat roosting potential |
| **TN24** | A pond (P17) providing average suitability for GCN and, along with a wet ditch which feeds it to the north, provides marginal suitability for water vole *Arvicola amphibius* |
| **TN25** | A wet ditch providing marginal suitability for water vole and with Himalayan balsam noted along the banks |
| **TN26** | Large, fallen, dead tree which provides good opportunities for reptiles, amphibians and invertebrates |
| **TN27** | Mature ash tree providing low bat roosting potential |
| **TN28** | Extensive Himalayan balsam is present at the northern end of a ditch |
| **TN29** | Ditch, predominantly wet but drying towards the northern end, and providing marginal suitability for water vole |
| **TN30** | Crack willow tree with low bat roosting potential |
| **TN31** | Four timber-built stables all provide negligible-to-low bat roosting potential |
| **TN32** | Large agricultural building provides negligible-to-low bat roosting potential |
| **TN33** | Himalayan balsam is scattered along the edge of the plantation woodland, beside the road |
| **TN34** | Wet ditch which is sub-optimal for water vole, given the very small volume of water and over-shading by trees limiting the growth of suitable bankside and marginal vegetation |
| **TN35** | An ephemeral pond (P8) providing poor suitability for GCN, with an outlier badger *Meles meles* sett situated nearby |

| | |
|---|---|
| **Title:** Target Notes | **Client:** Mace |
| **Site:** Raven | **Date:** October 2020 |

| | |
|---|---|
| **TN36** | An ancillary building in which a maternity roost of common pipistrelle *Pipistrellus pipistrellus* was recorded in 2009 and 2010 (although the current status of roosting bats within this building is not known) |
| **TN37** | A small stand of cotoneaster is located adjacent to a picnic area, considered most likely to be Franchet's cotoneaster *Cotoneaster franchetii* |

# APPENDIX 2
# RELEVANT LEGISLATION AND POLICY

Ecological features are protected under various United Kingdom (UK) and European legislative instruments. These are described below. European legislation is not included as it is incorporated in UK legislation by domestic provisions.

***The Conservation of Habitats and Species Regulations, 2017 (as amended)***

The Habitats Directive (Council Directive 92/43/EEC)[21] came into force in 1992 and provides for the creation of a network of protected wildlife areas across the European Union, known as 'Natura 2000'. The Natura 2000 network consists of Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive (Council Directive 79/409/EEC)[22]. These sites are part of a range of measures aimed at conserving important or threatened habitats and species.

The Conservation of Habitats and Species Regulations 2017[23] commonly known as 'the Habitats Regulations' transposes the Habitats Directive into national law and set out the provisions for the protection and management of species and habitats of European importance, including Natura 2000 sites. The 2017 bill consolidated all previous versions of the regulations and subsequent amendments since initial transposition, bringing them all under the single heading, and made a number of minor amendments. It extends to England and Wales, and to a limited extent Scotland and Northern Ireland. In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transposes the Habitats Directive in relation to Northern Ireland.

In addition to providing for the designation and protection of Natura 2000 sites, the Habitats Regulations provide strict protection for plant and animal species as European Protected Species. Derogations from prohibitions are transposed into the Habitats Regulations by way of a licensing regime that allows an otherwise unlawful act to be carried out lawfully for specified reasons and providing certain conditions are met. Under the Habitats Regulations, competent authorities have a general duty, in the exercise of any of their functions, to have regard to the Habitats Directive and Wild Birds Directive including in the granting of consents or authorisations. They may not authorise a plan or project that may adversely affect the integrity of a European site, with certain exceptions (considerations of overriding public interest).

***The Countryside and Rights of Way Act 2000***

The Countryside and Rights of Way Act 2000[24] primarily extends to England and Wales. It provides a new statutory right of access to the countryside and modernises the rights of way system, bringing into force stronger protection for both wildlife and countryside.

*The Act is divided into five distinct sections, Part III is of relevance to ecology:*

Part III - Nature Conservation and Wildlife Protection: The Act details a number of measures to promote and enhance wildlife conservation. These measures include improving protection for Sites of Special Scientific Interest (SSSIs) and increasing penalties for deliberate damage to SSSIs. Furthermore, the Act affords statutory protection to Ramsar Sites which are wetlands designated under the International Convention on Wetlands[25].

[21] European Commission (1992) Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. European Commission, Brussels
[22] European Commission (1979) Council Directive 79/409/EEC on the conservation of wild birds, European Commission, Brussels
[23] Secretary of State (2017) The Conservation of Habitats and Species Regulations. Her Majesty's Stationery Office (HMSO)
[24] Secretary of State (2000) The Countryside and Rights of Way Act. HMSO
[25] United Nations Educational, Scientific and Cultural Organization (UNESCO) (1971) Convention on Wetlands of International Importance especially as Waterfowl Habitat, as amended in 1982 and 1987. Ramsar, Iran Published in Paris, 1994

***Wildlife and Countryside Act 1981, as Amended in Quinquennial Review and by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006***

The Wildlife and Countryside Act 1981[26] forms the basis of much of the statutory wildlife protection in the UK. Part I deals with the protection of plants, birds and other animals and Part II deals with the designation of SSSIs.

This Act covers the following broad areas:

- Wildlife - listing endangered or rare species in need of protection and creating offences for killing, disturbing or injuring such species. Additionally, the disturbance of any nesting bird during breeding season is also noted as an offence, with further protection for species listed on Schedule 1. Measures for preventing the establishment of non-native plant and animal species as listed on Schedule 9 are also provided;
- Nature Conservation - protecting those Sites which are National Nature Reserves (NNR) and SSSI;
- Public Rights of Way - placing a duty on the local authority (normally the County Council) to maintain a definitive map of footpaths and rights of way. It also requires that landowners ensure that footpaths and rights of way are continually accessible; and
- Miscellaneous General Provisions.

The Act is enforced by Local Authorities.

***Natural Environment and Rural Communities (NERC) Act 2006***

Under the NERC Act 2006[27] Section 40, public authorities must show regard for conserving biodiversity in all their actions. Public authorities should consider how wildlife or land may be affected in all the decisions that they make. The commitment to the biodiversity duty must be measured by public authorities.

NERC Act 2006 Section 41 requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England.

***Protection of Badgers Act 1992***

The Protection of Badgers Act 1992[28] consolidated previous legislation relating specifically to badgers and protects both badgers and their setts. Under the Act, it is an offence to:

- Wilfully kill, injure or take, or attempt to kill, injure or take, a badger;

  Possess a dead badger or any part or derivative of a badger;
- Cruelly ill-treat a badger;
- Dig for a badger;
- Damage a badger sett or any part of it;
- Destroy a badger sett;
- Obstruct access to, or any entrance of, a badger sett;
- Cause a dog to enter a badger sett; or
- Disturb a badger when it is occupying a badger sett.

[26] Secretary of State (1981) Wildlife and Countryside Act. HMSO
[27] Natural Environment and Rural Communities Act 2006. HMSO
[28] Secretary of State (1992) Protection of Badgers Act 1992. HMSO

***Biodiversity Action Plans***

In 1994, Government produced the UK Biodiversity Action Plan (BAP)[29], a national strategy for the conservation of biodiversity. This led to the creation of the UK Biodiversity Steering Group, which has listed 1,150 Species Action Plans (SAPs) and 65Habitat Action Plans (HAPs). Regional and District/Borough BAPs apply the UK BAP at a local level.

From July 2012, the UK Post-2010 Biodiversity Framework[30] succeeds the UK BAP and Conserving Biodiversity - the UK Approach. This is as a result of a change in strategic thinking following the publication of the Convention on Biological Diversity's Strategic Plan for Biodiversity 2011 - 2020 and its 20 'Aichi targets', at Nagoya, Japan in October 2010, and the launch of the new EU Biodiversity Strategy (EUBS) in May 2011.

The UK Post-2010 Biodiversity Framework constitutes the UK's response to these new 'Aichi' strategic goals and associated targets. The Framework recognises that most work which was previously carried out under the UK BAP is now focussed on the individual countries of the United Kingdom and Northern Ireland, and delivered through each countries' own strategies.

Following the publication of the new Framework, the UK BAP partnership no longer operates. However, many of the tools and resources originally developed under the UK BAP remain of use. The UK list of priority species has been used to help draw up statutory lists of priorities in England, Scotland, Wales and Northern Ireland. For England, this is in line with the NERC Act 2006 Section 41.

***Biodiversity in the Planning Process***

Administrative and policy guidance on the application of some of these statutory obligations is provided through relevant government policy guidance and advice. In England, this includes National Planning Policy Framework 2012, National Planning Practice Guidance, Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System, Biodiversity 2020 and Natural Environment White Paper The natural choice: securing the value of nature.

***National Planning Policy Framework, 2019***

The National Planning Policy Framework (NPPF)[1] adopted in 2019 sets out the Government's planning policies for England and how these are expected to be applied. The NPPF contains the following statements which are of relevance (not an exhaustive list, but including those of highest relevance):

- Section 15, paragraph 170 states that the planning system should contribute to and enhance the natural and local environment by: "*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*";
- Section 15, paragraph 174 states that planning applications should "*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity*".
- Section 15, paragraph 174 states that - "*To protect and enhance biodiversity and geodiversity, plans should: identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and*

[29] Her Majesty's Stationery Office, 1994. Biodiversity: The UK Action Plan. London

[30] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), 2012. UK Post-2010 Biodiversity Framework. July 2012. jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf

[1] Department for Communities and Local Government, 2019. National Planning Policy Framework (NPPF). London. HMSO

*locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation*"; and

- Section 15, paragraph 175 states that when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles*: if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*". It also states that planning permission should be refused for: "*development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees)… unless there are wholly exceptional reasons and a suitable compensation strategy exists*".

***Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.***

This circular[31] provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the national planning policy in the National Planning Policy Framework and the Planning Practice Guidance.

***Natural Environment White Paper. The natural choice: securing the value of nature***

The Natural Environment White Paper[32] outlines the government's vision for the natural environment over the next 50 years, shifting the emphasis to an integrated landscape-scale approach. It describes the actions that will be taken to deliver that goal.

***Biodiversity 2020***

The Biodiversity 2020[33] strategy for England builds on the Natural Environment White Paper and provides a comprehensive picture of how England is implementing its international and EU commitments. It sets out the strategic direction for biodiversity policy on land (including rivers and lakes) and at sea.

The mission for this strategy is to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.

It is anticipated that this will be delivered through:

- a more integrated large-scale approach to conservation on land and at sea;
- putting people at the heart of biodiversity policy;
- reducing environmental pressures; and
- improving knowledge.

***Local Planning Policy***

*Lancashire Biodiversity Action Plan*

Lancashire BAP species and habitats are listed in the table below:

[31] Office of the Deputy Prime Minister (2005) Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System. https://www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005

[32] Defra (2011) Natural Environment White Paper. The natural choice: securing the value of nature https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature

[33] Defra, 2011. Biodiversity 2020. https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

| **Lancashire BAP Species** | **Lancashire BAP Species** |
|---|---|
| Bats | Natterjack Toad |
| Belted Beauty | Purple Ramping-fumitory |
| Bird's-eye Primrose | Lancastrian Whitebeam |
| Black Poplar | Great Crested Newt |
| Brown Hare | Lapwing |
| Black-tailed Godwit | Otter |
| Corn bunting | Sea Bindweed |
| Dwarf Cornel | Pearl-bordered Fritillary |
| Flat-sedge | Narrow Small-reed |
| Grey partridge | Hen Harrier |
| Skylark | Large Heath |
| Yellow wagtail | Lady's-slipper |
| Tree sparrow | Rock Sea-Lavender |
| Linnet | **Lancashire BAP Habitats** |
| Reed bunting | Broadleaved and Mixed Woodland |
| Yellowhammer | Species-rich Neutral Grassland |
| Red Squirrel | Calcareous Grassland |
| White-clawed Freshwater Crayfish | Reedbed; Mossland |
| Freshwater Pearl Mussel | Moorland/Fell |
| Greater Butterfly Orchid | Limestone Pavement |
| High Brown Fritillary | Arable Farmland |
| Northern Brown Argus | Sand Dune |
| Northern Brown Argus | |

# APPENDIX 3
# SITE PHOTOGRAPHS


**Photo 1.** A view north showing the area between HMP Wymott and HMP Garth

**Photo 2.** A view southwest across improved grassland in the southern portion of the site

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 3.** A view north across improved grassland in the southern portion of the site, showing Stanning's Folly in the distance

**Photo 4.** A typical view within the western portion of Stanning's Folly, showing wet woodland (TN1)

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 5.** Large fallen tree within Stanning's Folly, beneath which Sett 1 is located (TN35)

**Photo 6.** A typical view within the western portion of Stanning's Folly (TN2)

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 7.** A view northwest showing access road, improved grassland and plantation woodland

**Photo 8.** A typical view within a stand of plantation woodland between the two prisons

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 9.** A view northeast showing dry ditch, improved grassland and small stand of semi-natural woodland in the northeast of the site

**Photo 10.** A view southwest over amenity grassland between the two prisons, showing scattered trees surrounding carparks in the distance

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 11.** A view west across marshy grassland, showing belt of plantation woodland beyond

**Photo 12.** A view southwest along a road at the northwest-most point of the site, with Ulnes Walton (BHS) to the left

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 13.** A typical view within plantation woodland to the north of the site

**Photo 14.** Improved grassland, wet ditch and plantation woodland immediately northeast of HMP Garth

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 15.** A view southeast between the two prisons, showing improved grassland and wet ditch

**Photo 16.** Building for which records of a common pipistrelle maternity roost were returned from LERN, recorded in 2009/ 2010 (TN36)

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

**Photo 17.** A view southwest from the northern-most point of the site, showing improved grassland and belt of plantation woodland (with wet ditch running along the southeast edge; TN29)

**Photo 18.** A typical view of the belt of plantation woodland immediately east of HMP Wymott

| | | | |
|---|---|---|---|
| **Title:** | Site Photographs | **Client:** | Mace |
| **Site:** | Albatross & Razorbill | **Date:** | October 2020 |

CGO Ecology Ltd 27a Ridgefield Gardens Christchurch Dorset BH23 4QG UK

# Preliminary Ecological Appraisal of additional areas for proposed new prison, bowling club, and boiler house on land adjacent to HMP Garth and HMP Wymott, Leyland

CGO Ecology Ltd

Christchurch

5th August 2021

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Dr Chris Gleed-Owen MCIEEM, Director & Principal Ecologist

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| 1 | 21/04/2021 | n/a |
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| 3 | 05/08/2021 | Site name consistency corrections, update refs incl. NPPF 2021, updated figures. |

# Non-technical summary

*Introduction*

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a Preliminary Ecological Appraisal (PEA) of two areas at HMPs Garth and Wymott, Leyland, Lancashire. One area is 2.8ha within HMP Wymott (SD 5071 2062); the other area is 3.9ha of farmland to the north of HMP Wymott (SD 5068 2097). The Ministry of Justice proposes a development as part of its New Prisons Programme. The rest of the proposed development area was appraised by Ramboll in 2020. The Local Planning Authority is Chorley Council.

*Methodology*

Defra's MAGIC application was consulted on 17th April 2021 for protected sites and species within a 5km radius, and for general habitat and landscape information.

A PEA (Extended Phase 1 Habitat Survey) was conducted by experienced and suitably-qualified ecologists Dr Chris Gleed-Owen MCIEEM and Karl Harrison MCIEEM on 24th February 2021. This mapped Phase 1 habitats, recorded species, and identified and impact-assessed the site's biodiversity interests. A bat Potential Roost Assessment (PRA) was conducted on trees and buildings. A great crested newt (GCN) Habitat Suitability Index (HSI) assessment was conducted on the fishing lake.

*Baseline ecological conditions*

MAGIC shows 16 mitigation licences issued by Natural England within 5km: eight for bats (three species), eight for GCN. There are nine other records of great crested newt within 5km. There is one protected site within 5km, with no constraints. Screening for impacts on estuaries beyond 5km should be considered. The site is in a Nitrate Vulnerable Zone for surface water.

The Phase 1 habitats are: building, hardstanding, seminatural broadleaved woodland, plantation broadleaved woodland, plantation coniferous woodland, improved grassland, amenity grassland, intact species-poor hedgerow, scattered broadleaved trees, introduced shrub, standing water, ditch, fence, wall, with a floral list of 68 species. One building has moderate bat roost potential, two others are negligible. Three trees/tree groups have bat roost potential. Hedgehog is likely. Barn owl evidence was recorded in two buildings. A range of nesting birds are likely. GCN could be present. Reptiles are unlikely in this area. A range of farmland and woodland invertebrates is likely.

*Mitigation and compensation recommendations*

- Follow the mitigation hierarchy. Any loss of seminatural habitats must be fully compensated by replacement planting on-site and/or off-site offsetting. See also BNG recommendations.
- Two nocturnal bat surveys (dusk, dawn, four surveyors) of B10, suitable conditions/timing, May-August. If a bat emerges, further surveys and mitigation will be necessary.
- Climbed inspection and/or commensurate level of nocturnal surveys of trees/groups T2 to T4, with appropriate mitigation response.
- Monthly nocturnal bat activity transect surveys, April to October, with static detectors deployed for one week per month. Appropriate mitigation response devised from results. Likely to include constraints on external lighting of currently-dark areas used by bats.
- Hedgehog check when clearing vegetation, debris, or other locations where they may shelter. Incorporate 13cm x 13cm passes at the base of any new fences and walls. Install commensurate number of artificial hedgehog homes.
- Water vole survey (mid-April and mid-July) of all ditches and ponds on site. Appropriate mitigation response.
- Humane removal of brown rat colony in HMP Wymott former assault course. Humane methods for any other unprotected species.

- Barn owl survey in spring and summer, avoiding key nesting/fledging period, to determine barn owl use of site. Appropriate mitigation response.
- Tree and hedge removal to avoid March-August nesting season, and be compensated by sufficient new planting and nestbox provisions.
- GCN HSI assessment of all ponds on site and within 500m radius, with traditional nocturnal surveys and/or eDNA on all ponds with average of greater HSI. If GCN is detected in any ponds, further surveys and mitigation will be necessary for any affected areas.
- Reptile survey of all suitable habitat on site. Appropriate mitigation response.
- Invasive Non-Native Species (INNS) survey of site. Appropriate mitigation response. Biosecurity plan in place for duration of development process.

*BNG enhancement recommendations*

- These provisions are in addition to any mitigation requirements arising from the above recommendations.
- At least 20 batboxes (artificial roosts), for a range of species and roost types, installed in suitable locations on new builds and retained trees around the prison estate.
- At least 10 hedgehog homes placed in suitable woodland around the prison estate.
- At least 10 integrated swift-bricks installed on upper east or north elevations of new builds, at least 5m high, away from windows.
- At least 10 house sparrow terraces installed in suitable locations on new builds.
- At least 20 bird nestboxes, for a range of species, installed in suitable locations on new builds and retained trees around the prison estate.
- At least 20 integrated bee-bricks installed on upper south elevations of new builds, where they will receive maximum sunlight.
- Removal of any INNS present on prisons estate.

## Contents

# 1. Introduction

## 1.1. Background, brief

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a Preliminary Ecological Appraisal (PEA) of two areas at Her Majesty's Prisons (HMPs) Garth and Wymott, Leyland, Lancashire. One area is 2.8ha of sports field and former assault course within HMP Wymott (SD 5071 2062); the other area is 3.9ha of farmland to the north of HMP Wymott (SD 5068 2097). The Ministry of Justice proposes a development as part of its New Prisons Programme. The rest of the proposed development area has already been subject to a PEA by Ramboll (Molesworth, 2020). The Local Planning Authority (LPA) is Chorley Council.

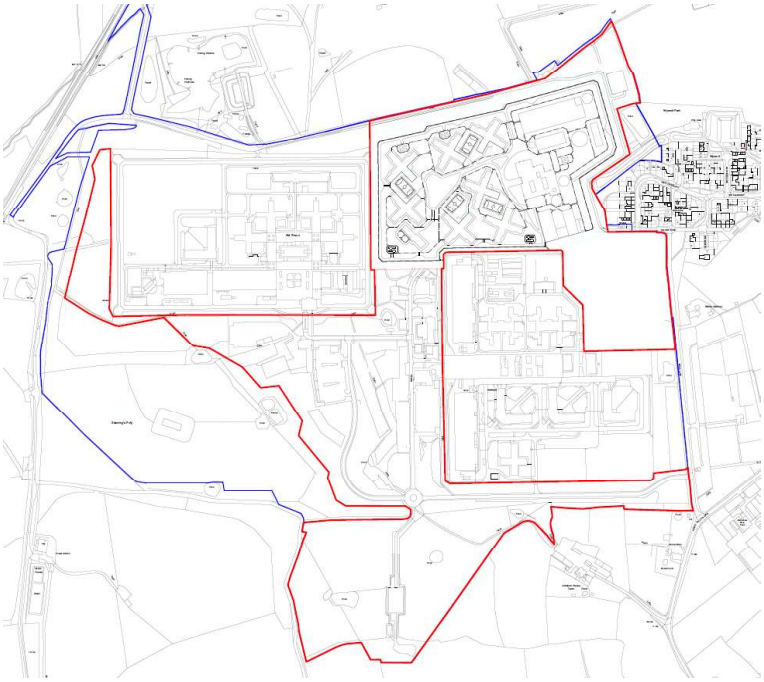

Figure 1 – Application area (red line) and MoJ ownership boundary (blue outline).

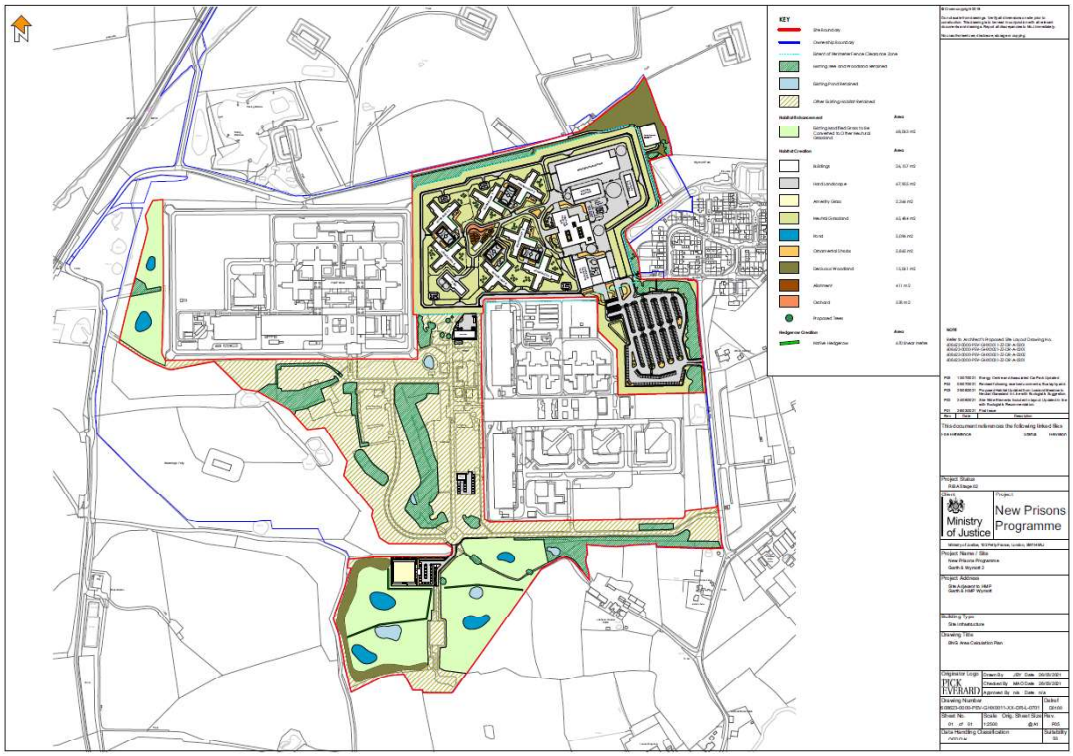


Figure 2 – Proposed development and landscaping, including habitat enhancement areas.

### 1.2. Legislation and planning

Many species of wildlife and habitat types in Britain are protected by laws such as the Wildlife and Countryside Act 1981 (as amended) (WCA), Protection of Badgers Act 1992, Habitats Regulations 2019 (post-Brexit), NERC Act 2006 (esp. Section 41), and Hedgerow Regulations 1997. Works that may harm or disturb protected species, or damage their habitats, must be impact-assessed by an ecologist, and mitigated/compensated as necessary.

A PEA is the first stage, typically involving an Extended Phase 1 Habitat Survey to assess the site's ecological value and potential impacts of the proposed development on protected and notable species, habitats and protected sites. This may be followed by 'phase 2' species surveys and/or a full Ecological Impact Assessment (EcIA) if required under The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

Buildings, structures, and trees may require a PRA for bats, either as part of a PEA, or as a separate survey. This may result in the need for further surveys to satisfy planning.

Trees can be protected individually or as a group/area by a Tree Preservation Order (TPO) under the Town and Country Planning Act 1990 (as amended) and/or the Town and Country Planning (Tree Preservation) (England) Regulations 2012.

Where a development may have an impact on an internationally-protected site, an 'appropriate assessment' (AA) also known as a 'Habitats Regulations Assessment' (HRA) may be necessary under the Habitats Regulations 2019. The 'competent authority' responsible for this process is usually the LPA, but an ecological consultancy can provide 'shadow HRA screening' and/or a shadow AA/HRA on its behalf.

LPAs also have a duty under the National Planning Policy Framework (NPPF) (MHCLG, 2021) to deliver measurable Biodiversity Net Gain (BNG), i.e. no net loss, plus enhancements, for all developments. BNG must be in addition to any mitigation or compensation provisions required to achieve no net loss. Defra's Biodiversity Metric 2.0 is becoming widely adopted as the standard calculator, using a habitat list based on the new UKHab system rather than traditional Phase 1 habitat system. The Environment Bill, which is due to be enacted in autumn 2021, will require 10% BNG on all developments, and consistent adoption across the country.

### 1.3. Surveyors

The PEA was led by Dr Chris Gleed-Owen BSc (hons) PhD MCIEEM, Director & Principal Ecologist of CGO Ecology Ltd. He has been an ecological consultant since 2008 (13 years). He is trained in First Aid at Work, Fire Marshal, Asbestos Awareness, CDM Awareness, COSHH, Manual Handling, and Health & Safety Management. Survey licences: CL09 great crested newt (GCN, *Triturus cristatus*), sand lizard (*Lacerta agilis*), smooth snake (*Coronella austriaca*), natterjack toad (*Epidalea calamita*), Roman snail (*Helix pomatia*). Previous mitigation licence-holder for smooth snake and/or sand lizard (6), and badger (*Meles meles*) sett closure (3). Experienced surveyor of Phase 1 habitats, National Vegetation Classification (NVC), flora (FISC level 4 botanist), vertebrates, and invertebrates.

The site's bat potential was assessed by Karl Harrison BSc MCIEEM who has a level 2 (CL18) bat survey licence, and extensive survey and mitigation experience. He has been an ecological consultant for nine years, and works for Haycock & Jay Associates Ltd subcontracted to CGO Ecology Ltd. The Phase 1 habitat maps were drawn by Jack Parker.

## 2. Methodology

### 2.1. Desk study

The Defra MAGIC website (https://magic.defra.gov.uk/MagicMap.aspx) was consulted on 17th April 2021 for protected sites and species within a 5km radius, and for general habitat and landscape information.

A Lancashire Environment Record Network (LERN) 2km data search was conducted by Ramboll as part of their PEA of the rest of the site (Molesworth 2020). The results have been made available by Ramboll, and were reviewed as part of the current exercise.

### 2.1. Field survey

The PEA involved an Extended Phase 1 Habitat Survey. Phase 1 habitats were mapped following the JNCC (2010) methodology, and a floral list was recorded. Any birds, mammals, and other vertebrates seen were identified and recorded where possible, including searches for tracks, nests, burrows, droppings, and other evidence. Invertebrates were recorded and identified where possible from an active search. This allowed for all protected and notable species and habitats to be appropriately impact-assessed, and suitable mitigation responses and enhancements to be conceived.

A GCN Habitat Suitability Index (HSI) assessment was made of the fishing lake, using standard guidance (ARGUK, 2010).

A Preliminary Roost Assessment (PRA) for bats was conducted on the same visit, following standard guidance (Collins, 2016). Buildings were inspected externally, and following risk-assessment under current Covid-19 guidance for bat surveys (BCT, 2020; CIEEM, 2020; IUCN, 2020), an internal inspection was also conducted where possible. Externally, features such as small gaps under barge/soffit/fascia boards, raised or missing ridge tiles, crevices in walls, ceiling joints and gaps at gable ends, which have potential to be used as access points, were sought. A search was made for evidence that bats actively use potential access points include staining within gaps, oily stains, bat droppings, bat noise or urine staining under gaps.

The buildings were numbered B10 to B12, following on from numbering used by Ramboll (2020). Their roost potential was classified according to Collins (2016), by combination of the features observed, the setting, and knowledge of bat presence-absence in the area.

All trees were inspected from ground-level, using high-powered binoculars, torch, and endoscope. Any Potential Roost Features (PRFs) were identified, recorded, and their bat roost potential graded according to Collins (2016).

The PEA and PRA were conducted between 10:00-17:00 on 24th February 2021, in mild overcast weather (12ºC, 100% cloud cover, 94% relative humidity, occasional light rain, wind Beaufort 0-1 southwest).

Other phase 2 ecology surveys are under way from March to October 2021. These will be reported separately, but any pertinent interim results are incorporated into this report.

### 2.3. Limitations

The season and conditions were suboptimal for biological recording, but sufficient for mapping habitats accurately, and adequately assessing the site's potential for protected and notable species.

## 3. Baseline ecological conditions

### 3.1. Desk study

The Defra MAGIC website shows only one protected site designation within 5km: Longton Brickcroft LNR (Local Nature Reserve) 4.5km north. The River Douglas, a tributary of the Ribble, lies 4.5km west of the site. Therefore, any development in this catchment should be screened for potential impacts on the integrity of the Ribble Estuary SSSI (Site of Special Scientific Interest), Ribble Estuary NNR (National Nature Reserve), Ribble & Alt Estuaries SPA (Special Protection Area), and Ribble & Alt Estuaries Ramsar site.

According to MAGIC, the Impact Risk Zones of protected sites in the wider area require Natural England consultation in the following circumstances:

"Infrastructure - Airports, helipads and other aviation proposals.
Wind & Solar Energy - Solar schemes with footprint > 0.5ha, all wind turbines.
Air Pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 4000m².
Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.
Discharges - Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream."

The site is within a Nitrate Vulnerable Zone (NVZ) for surface water (S646 Lostock). This limits the volume of water discharge to drains or soakaways to 20m$^3$ per day.

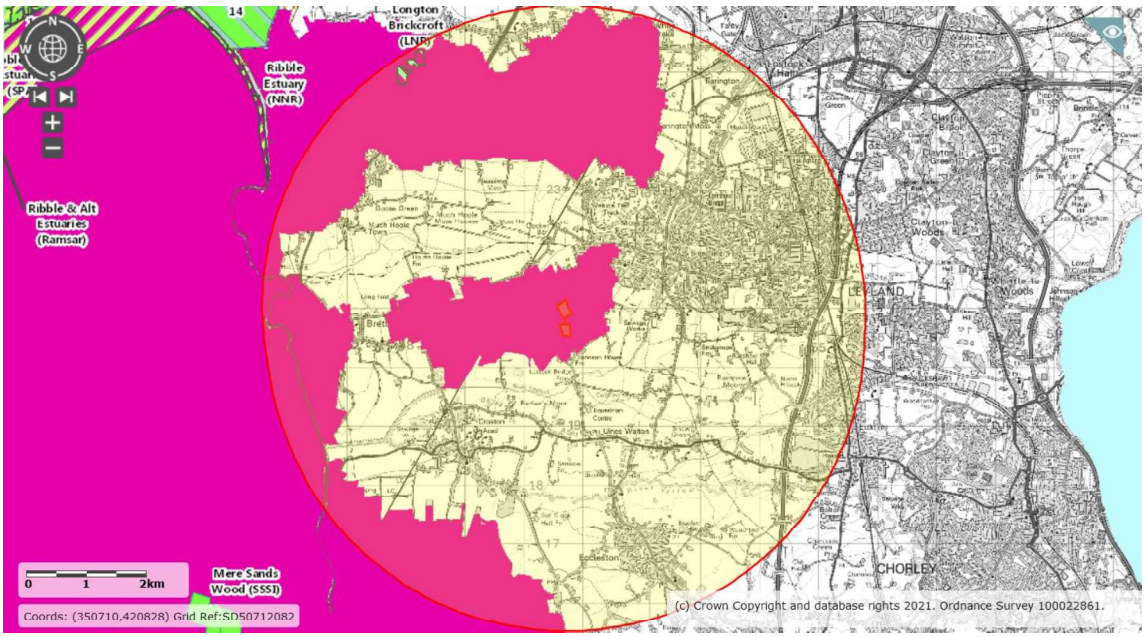


Figure 3 – Defra MAGIC map showing Nitrate Vulnerable Zones (pink areas) and other statutory site designations (other coloured areas) in relation to 5km radius from site.

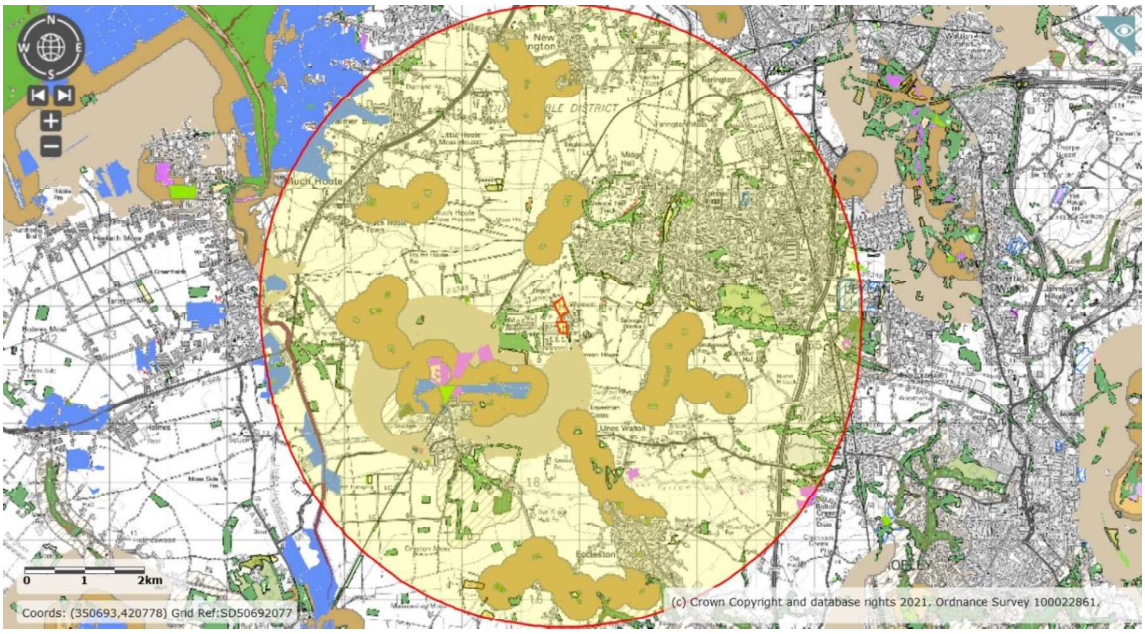


Figure 4 – Defra MAGIC map showing Priority Habitats and National Habitat Network 'Network Expansion Zone' radii (coloured areas) in relation to 5km radius from site.

MAGIC shows no mapped Priority Habitats on or near the site, and no National Habitat Network 'Network Expansion Zones' on or near the site. Important bird records exist within 5km, for corn bunting (*Emberiza callandra*), curlew (*Numenius arquatus*), grey partridge (*Perdix perdix*), lapwing (*Vanellus vanellus*), and tree sparrow (*Passer montanus*).

Soils here are slowly-permeable, seasonally-wet, slightly-acid but base-rich loams and clays. The predominant soil is loam with impeded drainage and moderate natural fertility. Characteristic seminatural habitats are lowland seasonally-wet pastures and woodlands. Modern land uses are mainly arable and grassland, with some woodland. The National Character Area is Lancashire and Amounderness Plain.

Natural England has issued 16 European Protected Species (EPS) mitigation licences within 5km. Eight of these were for bats, the nearest being 400m south for common pipistrelle (*Pipistrellus pipistrellus*). The others are for common pipistrelle and/or brown long-eared bat (*Plecotus auritus*), with one also including Brandt's bat (*Myotis brandtii*) 4.3km north. Eight licences were issued for GCN, the nearest being 1.2km east. MAGIC also shows nine GCN occurrence records from surveys. The nearest is 1.4km east. Another is 1.9km north. The others are 3-5km away.

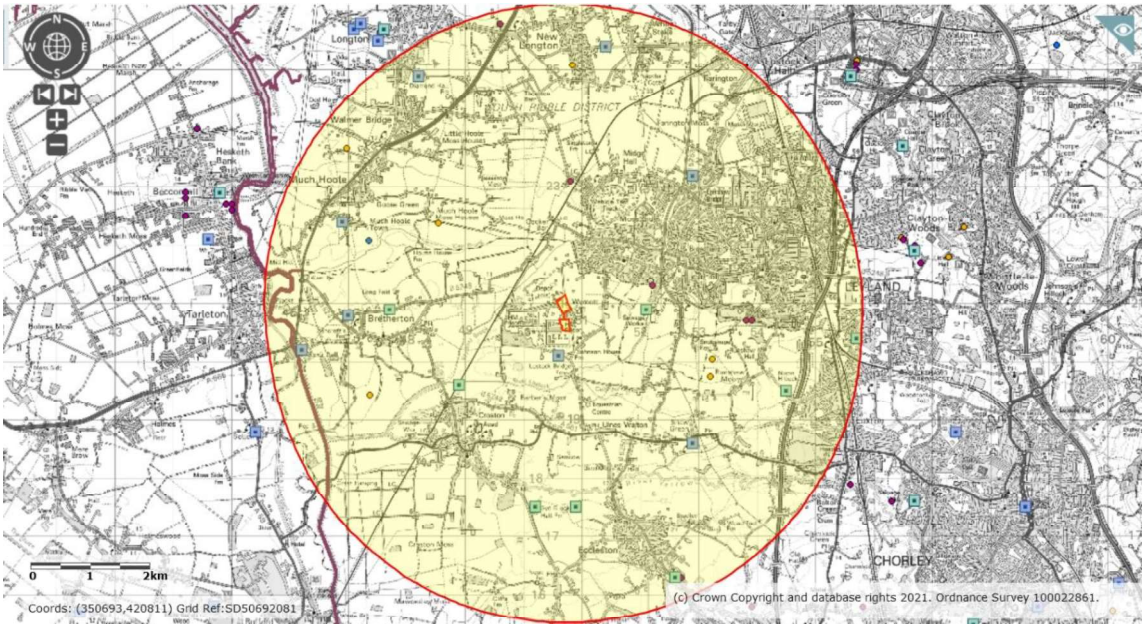


Figure 5 – Defra MAGIC map showing EPS mitigation licences issued by Natural England for bats (blue squares) and GCN (green squares), and other GCN occurrence records (purple and blue dots = presence, orange dots = absence) in relation to 5km radius from site.

The LERN search for the previous PEA conducted by Ramboll (Molesworth, 2020) returned 60 GCN records within 2km.

Additional results of note from the LERN search include many 'Lancashire Key Species' which are legally protected, nationally or locally red-listed, or Invasive Non-Native Species (INNS). These are a material consideration in local planning: GCN (60 records within 2km), common toad (*Bufo bufo,* 32), other widespread amphibians (55), barn owl (*Tyto alba,* 8), turtle dove (*Streptopelia turtur* 1), lesser redpoll (*Acanthis cabaret,* 1), and 53 other bird species (286), European eel (*Anguilla anguilla,* 45), native black poplar (*Populus nigra betulifolia*), other plants (126), 22 insect species (90), water vole (*Arvicola amphibius,* 12), hedgehog (*Erinaceus europaeus,* 9), otter (*Lutra lutra,* 4), water shrew (*Neomys fodiens*).

### 3.2. Phase 1 habitats

See figures 6-8 below.

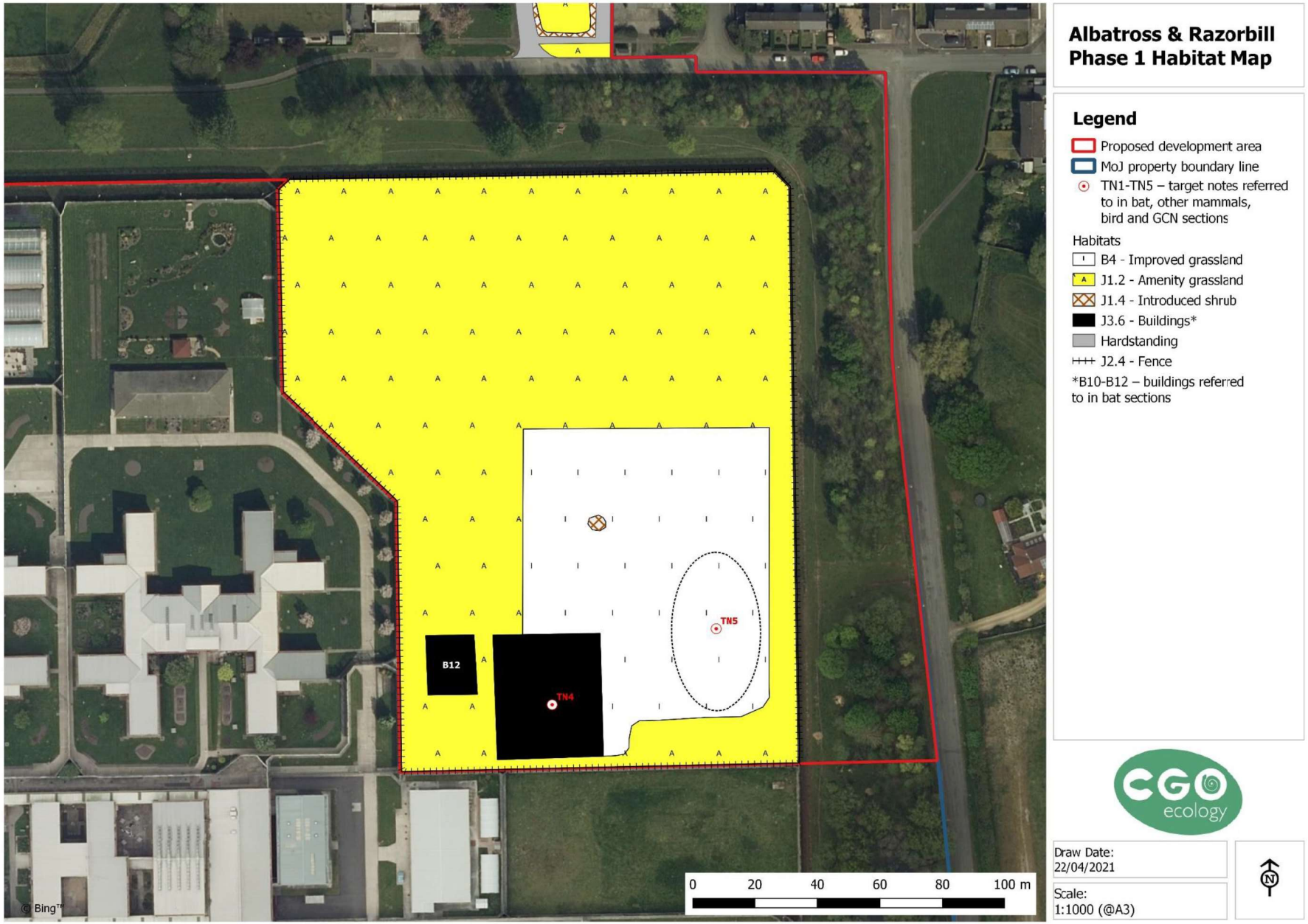


Figure 6 – Phase 1 habitat map 1 of 3, showing area within HMP Wymott. Colour scheme after JNCC (2010). TN4 = portacabins with negligible bat roost potential. TN5 = brown rat colony in former assault course.

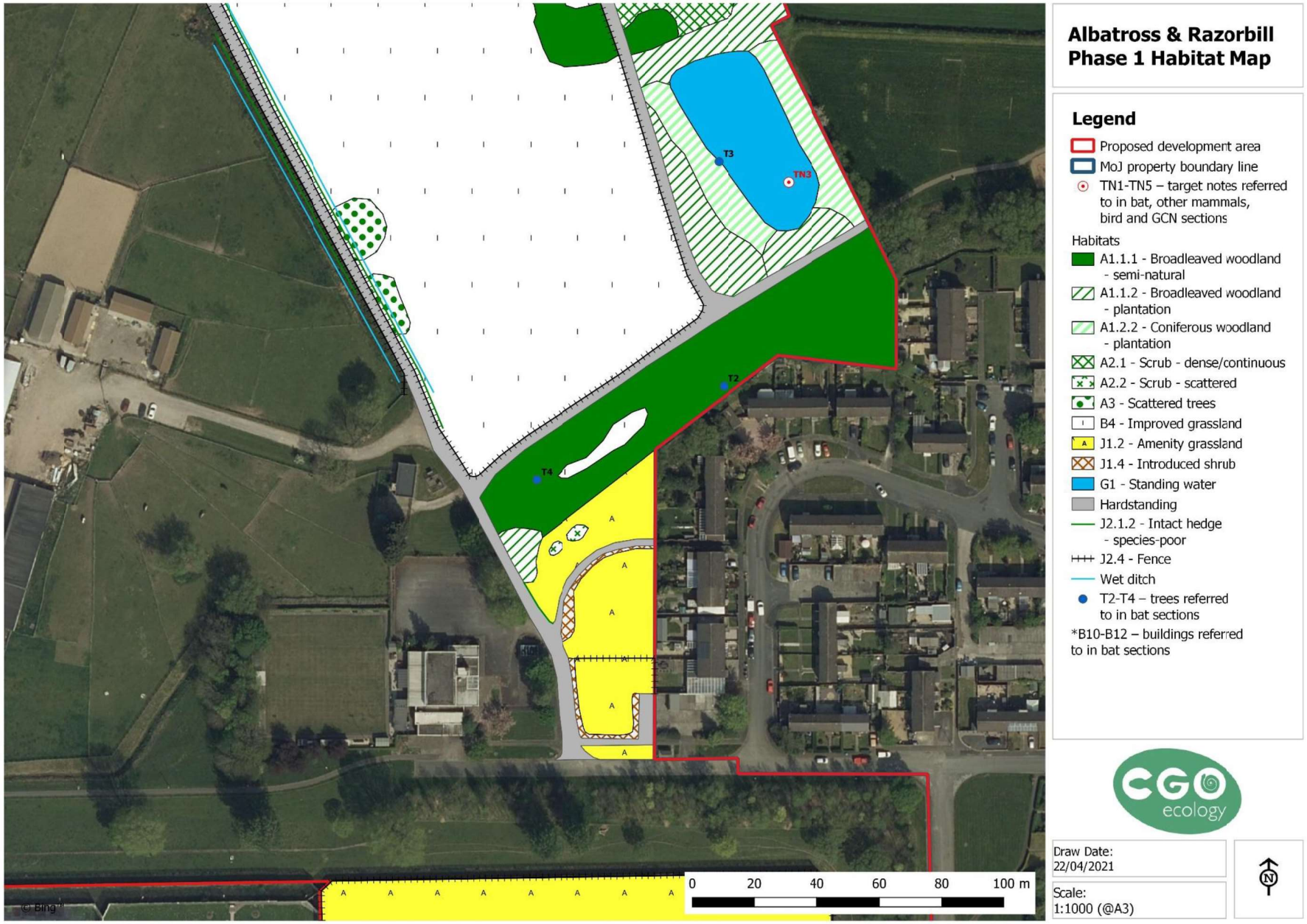


Figure 7 – Phase 1 habitat map 2 of 3, showing the gardens and woodland adjacent to Wymott estate. Colour scheme after JNCC (2010). TN3 = fishing lake.

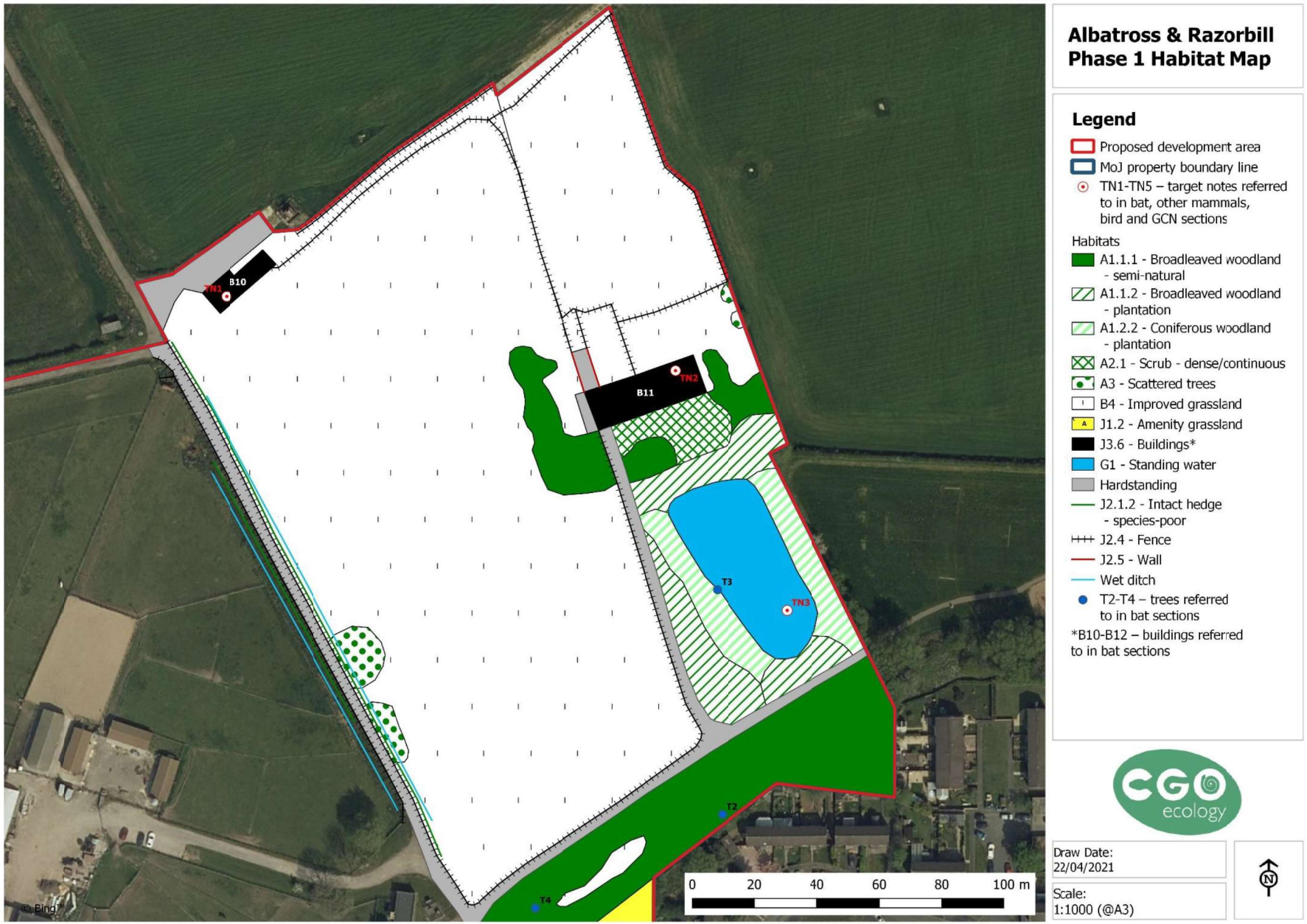


Figure 8 – Phase 1 habitat map 3 of 3, showing farmland and fishing lake north of Wymott estate. Colour scheme after JNCC (2010). TN1 = barn owl. TN2 = barn owl box, pellets.

The site comprises two main areas, one within HMP Wymott, and another outside HMP Wymott on farmland to the north. Within Wymott, the following Phase 1 habitats are present: building, hardstanding, amenity grassland, improved grassland, fence. Outside Wymott, the phase 1 habitats are: improved grassland, ditch, intact species-poor hedgerow, seminatural broadleaved woodland, plantation broadleaved woodland, plantation coniferous woodland, scattered broadleaved trees, continuous scrub, introduced shrub, standing water, building, hardstanding, fence, wall.

### 3.3. Flora, fungi

A floral list of 68 species was recorded from both areas combined, comprising 25 species within HMP Wymott, and 47 species on the area north of HMP Wymott. None of these are particularly notable, or additional to the list provided by Ramboll (2020). A further survey in late spring to early summer would inevitably add more species to the list. No fungi were recorded.

| **Common name** | **Species** |
|---|---|
| Annual meadow-grass | *Poa annua* |
| Broad-leaved dock | *Rumex obtusifolius* |
| Cock's-foot | *Dactylis glomerata* |
| Common bird's-foot-trefoil | *Lotus corniculatus* |
| Common mouse-ear | *Cerastium fontanum* |
| Creeping buttercup | *Ranunculus repens* |
| Creeping thistle | *Cirsium arvense* |
| Curled dock | *Rumex crispus* |
| Daisy | *Bellis perennis* |
| Dandelion | *Taraxacum officinale* agg. |
| Groundsel | *Senecio vulgaris* |
| Lesser trefoil | *Trifolium dubium* |
| Meadow buttercup | *Ranunculus acris* |
| Meadow fescue | *Festuca pratensis* |
| Mugwort | *Artemisia vulgaris* |
| Perennial rye-grass | *Lolium perenne* |
| Procumbent pearlwort | *Sagina procumbens* |
| Ribwort plantain | *Plantago lanceolata* |
| Rough meadow-grass | *Poa trivialis* |
| Selfheal | *Prunella vulgaris* |
| Soft-rush | *Juncus effusus* |
| Sowthistle | *Sonchus* sp |
| Spear thistle | *Cirsium vulgare* |
| Weld | *Reseda luteola* |
| Yorkshire-fog | *Holcus lanatus* |

Table 1 – Floral list recorded inside HMP Wymott.

| **Common name** | **Species** |
|---|---|
| Alder | *Alnus glutinosa* |
| Ash | *Fraxinus excelsior* |
| Atlas cedar | *Cedrus atlantica* |
| Beech | *Fagus sylvatica* |
| Box | *Buxus sempervirens* |
| Bramble | *Rubus fruticosus* agg. |
| Broad-leaved dock | *Rumex obtusifolius* |
| Buddleia/butterfly-bush | *Buddleja davidii* |
| Cleavers/goosegrass | *Galium aparine* |
| Cock's-foot | *Dactylis glomerata* |
| Common figwort | *Scrophularia nodosa* |

| | |
|---|---|
| Common ivy | *Hedera helix* |
| Common nettle | *Urtica dioica* |
| Common reed | *Phragmites australis* |
| Cow parsley | *Anthriscus sylvestris* |
| Crack-willow | *Salix fragilis* |
| Creeping buttercup | *Ranunculus repens* |
| Cut-leaved crane's-bill | *Geranium dissectum* |
| Daffodil | *Narcissus pseudonarcissus* subsp. *pseudonarcissus* |
| Daisy | *Bellis perennis* |
| Dandelion | *Taraxacum officinale* agg. |
| Firethorn | *Pyracantha coccinea* |
| Garden peony | *Paeonia officinalis* |
| Garden rose | *Rosa agg.* |
| Grey poplar | *Populus x canescens* |
| Hard rush | *Juncus inflexus* |
| Hawthorn | *Crataegus monogyna* |
| Lawson's cypress | *Chamaecyparis lawsoniana* |
| Lesser trefoil | *Trifolium dubium* |
| Leyland cypress | *X Cuprocyparis leylandii* |
| Lords-and-Ladies | *Arum maculatum* |
| Male-fern | *Dryopteris filix-mas* |
| Meadow buttercup | *Ranunculus acris* |
| Oregon-grape | *Mahonia aquifolium* |
| Red fescue | *Festuca rubra* |
| Rosebay willowherb | *Chamerion angustifolium* |
| Silver birch | *Betula pendula* |
| Soft-rush | *Juncus effusus* |
| Sowthistle | *Sonchus* sp |
| Violet | *Viola* sp |
| White clover | *Trifolium repens* |
| White dead-nettle | *Lamium album* |
| Wild cherry | *Prunus avium* |
| Willow-leaved cotoneaster | *Cotoneaster salicifolius* |
| Wood avens | *Geum urbanum* |
| Yellow crocus | *Crocus x stellaris* |
| Yorkshire-fog | *Holcus lanatus* |

Table 2 - Floral list recorded on farmland area to north of HMP Wymott.

The grassland within HMP Wymott is mostly perennial rye-grass-dominated short-mown grassland, occasionally used as sports pitches. The southeast part is rougher with a tussocky sward, and contains several mounds formerly used as an assault course, with a tyre tunnel and wet sump. Cocksfoot, rough meadow grass, meadow fescue, and Yorkshire fog are among the additional grasses recorded in this area. There is a single-storey brick building and an area of temporary portacabins to the southwest.

The area north of HMP Wymott is mostly improved pasture grazed by sheep (*Ovis aries*), with only cocksfoot and Yorkshire fog identified among the grasses. Between fields are hawthorn-dominated hedges, wet damp ditches (becoming damp to dry in places), fences, and metalled tracks. To the east is a fishing lake surrounded by plantation woodland. To the north of this is a brick-built cow barn with wooded and scrub-covered mounds around it. A second brick-built barn lies further north.

### 3.4. Bats

Three buildings are present within the additional PEA areas, and have been numbered B10 to B12. See Phase 1 habitat maps for locations.

B10 is a brick-built barn with corrugated asbestos roof. Open windows with timber frames and concrete lintel. Walls in good condition. One rendered gable. Gaps between bricks and roof material. Lifted flashing at gable, cracks in lintel above large shutter door. No closed roof void. Lower-level flat roof joining building with concrete roof. It has moderate bat roost potential (cf. Collins, 2016), and would require four surveyor positions to observe all features.

B11 is a brick-build cow barn surrounded by high earth banks. Frame is concrete and metal, with single brick layer, open windows, gable ends double brick. It has negligible bat roost potential.

B12 is a single-storey brick-built pavilion with sloping metal roof, and soffits of plastic, wood and metal that do not provide habitable crevices or voids. It has negligible bat roost potential.

Adjacent to B12 is an area of 48 temporary portacabins (installed as a Covid precaution, but not used). They have negligible bat roost potential.

### 3.5. Other mammals

Hedgehog is likely in the area. No badger evidence was seen. No protected or notable mammals are likely to be present inside HMP Wymott, but water vole could be present in the farmland ditches north of the prison. Brown rat (*Rattus norvegicus*) is abundant in the former assault course inside HMP Wymott. The several mounds are riddled with tunnels, and there is a dense network of paths through the surrounding rough grassland. A trailcam survey was conducted in March 2021 (C. Gleed-Owen data) because fossorial water vole was suspected. Four infrared motion-activated cameras were deployed for one week, which collected numerous videos of brown rat, but no other mammals. Scattered mole (*Talpa europaea*) hills are present on the farmland north of HMP Wymott. Other common small mammals are likely to inhabit the farmland and woodland.

### 3.6. Birds

During the PEA walkover within Wymott, a flock of c.20 herring gull (*Larus argentatus*), c.20 oystercatcher (*Haematopus ostralegus*), and c.30 wood pigeon (*Columba palumbus*) were circling noisily above. During the subsequent trailcam survey of the former assault course area, a pair of mallard (*Anas platyrhynchos*) were found to be nesting in a tyre tunnel.

During the PEA walkover of farmland and fishing lake to the north of Wymott, barn owl, blackbird (*Turdus merula*), blue tit (*Cyanistes caerulea*), carrion crow (*Corvus corone*), coal tit (*Periparus ater*), collared dove (*Streptopelia decaocto*), herring gull, oystercatcher (*Haematopus ostralegus*), robin (*Erithacus rubecula*), song thrush (*Turdus philomelos*), and wood pigeon were seen and/or heard. A barn owl was present within B10 during the bat inspection, and a barn owl box with a scatter of pellets beneath was observed in B11.

Scrub, hedge and woodland areas provide nesting habitat for a range of farmland birds. The two large barns have barn owl roost and nesting potential. There is little rough grassland suitable for barn owl foraging on or near the site, however. The woodland on site could support tree sparrow and a range of other Lancashire notables.

### 3.7. Amphibians

GCN could potentially be present on site, although less likely here than other areas within the Garth/Wymott prison estate. The fishing lake scored ‘below average’ in the HSI assessment using ARGUK (2010) guidance, mainly due to the high density of stocked fish.

There are several other ponds within 500m. The intervening landscape has patches of woodland, scrub, rough grassland, and ditches that would suit terrestrial GCN, but the grazing pastures offer low quality terrestrial habitat, and poor connectivity overall.

The fishing lake could support breeding common toad (*Bufo bufo*), as this species is fish-tolerant. Common toad is a Section 41 (NERC Act 2006) species, requiring consideration in planning.

### 3.8. Reptiles

No reptiles were returned by the LERN search within 2km, and they are scarce overall on the low-lying coastal plain. The site is mostly close-grazed pasture and woodland, and therefore has relatively little habitat suitable for reptiles. Suitable areas are limited to field edges and ditch banks. Potentially, occasional grass snake (*Natrix helvetica*) could be present. Slow-worm (*Anguis fragilis*) is unlikely.

### 3.9. Fish

No fish are likely to be present in the ditches on site, as they are too shallow and intermittent. According to an angling club member, the fishing lake is stocked with barbel (*Barbus barbus*), bream (*Abramis brama* agg), carp (*Cyprinus carpio*), perch (*Perca fluviatilis*), roach (*Rutilus rutilus*), rudd (*Scardinius erythrophthalmus*), and tench (*Tinca tinca*). European eel (*Anguilla anguilla*) is also sometimes caught there (possibly occurring naturally).

### 3.10. Invertebrates

The following species were recorded during the PEA: brown-lipped banded snail (*Cepaea nemoralis*), common garden snail (*Cornu aspersum*), netted slug (*Deroceras reticulatum*). The site probably supports a range of woodland and farmland species. The ditches may support aquatic invertebrates.

### 3.11. Invasive species

No WCA Schedule 9 plant species (illegal to plant in the wild, or to allow to spread in the wild) or other INNS were observed. However, the season was not optimal for detection of invasive plant species.

## 4. Mitigation, compensation, and enhancement recommendations

### 4.1. Protected sites

The proposed development is not likely to directly impact any protected sites within 5km. However, it is within the catchment of the River Douglas, a tributary of 'internationally-protected' sites (Ribble Estuary SSSI, Ribble Estuary NNR, Ribble & Alt Estuaries SPA, Ribble & Alt Estuaries Ramsar site). This may incur a higher level of scrutiny from the LPA, Environment Agency, and/or Natural England in terms of potential in-combination effects. The site lies within a surface water NVZ which restricts the volume of allowable drainage off-site. It is recommended, therefore, that the development seeks to be neutral in its impact on local watercourses, with a view to the avoidance of any impacts on the wider catchment.

### 4.2. Phase 1 habitats

In line with the NPPF (MHCLG, 2021), the principle of no net loss and BNG will be incorporated into the mitigation response. BNG calculations will be made using the Defra Metric 2.0 to measure baseline conditions against proposed design options. The upcoming Environment Bill is anticipated to require 10% BNG, which may need to involve off-site compensatory habitat provisions.

### 4.3. Flora, fungi

No protected or notable plant species were recorded, and no specific mitigation is warranted.

### 4.4. Bats

B10 has moderate potential for roosting bats, and under the standard survey guidelines (Collins, 2016), it requires two nocturnal surveys, comprising one dusk emergence and one dawn re-entry, in suitable conditions during the May-August period. It requires a minimum of four surveyors to adequately watch all features and elevations. Surveyors must use full-spectrum detectors. If no bats emerge, no further survey or mitigation is necessary. If any bat emerges, a further nocturnal survey (dusk or dawn) and appropriate licensed mitigation will be necessary.

B11 and B12 have negligible bat roost potential, and require no further survey or mitigation.

Four trees/tree groups, numbered T2 to T4 in the Phase 1 habitat maps, have been identified as having bat roost potential. Ash T2 requires soft felling, avoiding hibernation period, supervised by a level 2 (CL18) licensed bat ecologist. Further assessment of several trees (T3) adjacent to the fishing lake is expected to rule these trees out. However, some could have bat roost potential on closer inspection. T4 is a pair of crack-willows which will require inspection from ground-level to assess bat roost potential before ruling them out. The required level of inspection was beyond the scope of a PEA.

The open rural nature of the site, with woodland, hedgerows, and a waterbody, requires further assessment for bat activity, to determine the species present, and the degree of bat activity on the site. This includes commuting, foraging and/or roosting bats. Monthly nocturnal activity transects must be conducted, therefore, from April to October, following standard guidance (Collins, 2016). In addition, static detectors must be deployed for one week per month, to monitor bat species and activity levels. The results must inform an appropriate mitigation response. As a minimum, it is likely that no external lighting will be permissible on any currently-dark edges of the site where bat activity is shown to be significant. This is in line with widely-accepted guidance (BCT & ILP, 2018).

To enhance the site for bats, at least 20 batboxes must be erected on the new builds and/or on suitable retained trees on the prisons estate. These must be erected on the upper part of a south or east elevation, at least 3m high, ideally below the eaves, away from windows and external lighting. Schwegler 2F boxes are suitable for a range of species, but the developer can choose from a wide selection of solutions available online, including discreet designs for attachment to buildings. Tree-mounted batboxes should include models targeting rarer species, and maternity colony boxes.

### 4.5. Other mammals

Care must be taken to safeguard hedgehogs which may be sheltering in vegetation or other material that needs to be cleared during enabling works. A hedgehog check must be made when clearing any area, or moving materials. To prevent habitat fragmentation, the new builds must incorporate 13cm x 13cm passes at the base of any new fences and walls. A commensurate number of artificial hedgehog homes must be installed to compensate the estimated loss of habitat.

A water vole survey must be conducted following the standard protocol (Dean *et al,* 2016) of two surveys from mid-April onwards and mid-July onwards, of all ditches and ponds on site. An appropriate mitigation response will then be devised.

Humane removal of the brown rat colony in HMP Wymott's former assault course will be necessary. Similarly, humane methods will be necessary for evicting any other unprotected species (e.g. red fox *Vulpes vulpes,* grey squirrel *Sciurus carolinensis*).

As an enhancement, at least 10 hedgehog homes must be placed in suitable retained woodland around the prison estate.

### 4.6. Birds

A barn owl survey must be conducted in spring and summer, avoiding the most sensitive times for nesting and fledging. This will involve site-wide walkovers and building inspections for nests and roosts, as well as dusk watches for foraging barn owls. A commensurate mitigation response will be formulated, under Natural England licence where appropriate.

The loss of woodland, hedgerow and other nesting opportunities for birds must be fully compensated by replacement planting and nestbox provisions on or off-site.

As an enhancement, at least 10 integrated swift-bricks for nesting swift (*Apus apus*) to be installed on upper east or north elevations of new builds, at least 5m high, away from windows. At least 10 house sparrow (*Passer montanus*) terraces to be installed in suitable locations on new builds. At least 20 bird nestboxes, for a range of species, to be installed in suitable locations on new builds and retained trees around the prison estate. If tree sparrow is present, some should target these.

### 4.7. Amphibians

A GCN HSI assessment of the fishing lake was 'below average' using the ARGUK (2010) guidance. Similar assessment must be made of all ponds within 500m of the development. It is normal practice to then conduct a full survey all ponds with average or above HSI score, and in some cases (e.g. where access is constrained), all ponds should be surveyed.

Survey can involve four nocturnal surveys using traditional methods (three out of torchlight count, bottle-trapping, egg search and/or hand-netting) to determined presence-absence. Where GCN presence is detected, two further nocturnal surveys are necessary. These must be within the mid-March to mid-June survey window, with the majority in the mid-April to mid-May window. As an alternative for GCN presence-absence, an eDNA test is quicker, cheaper, and easier, but can only take place between mid-April to end of June. Presence would then require six visits using traditional methods.

If GCN presence is not present, it can be ruled out from further investigation or mitigation. If GCN presence is present, a licensed mitigation programme must be agreed with Natural England. These recommendations comply with current industry guidance (English Nature, 2001). Lancashire is within the District Level Licensing scheme, should that route be chosen.

### 4.8. Reptiles

A reptile survey must be conducted, comprising deployment of artificial refugia and visual search, seven visits in appropriate conditions, in the optimal months of April, May or September. If reptiles are present, and appropriate mitigation response will be necessary. It is likely that, even if reptiles are present, their presence is marginal.

### 4.9. Fish

No fish are likely to be affected, and no further consideration is necessary.

### 4.10. Invertebrates

Any loss of ditches must be compensated by provision of new ditches, ponds and swales. As an enhancement, at least 20 integrated bee-bricks must be incorporated into the upper courses of south elevations of the new builds, where they will receive maximum sunlight. Bee-bricks are closed at the rear, and do not allow bees to enter the wall cavity. Alternatively, they may be placed free-standing on roofs or other sunny places.

### 4.11. Invasive species

A Biosecurity Plan must be in place for the whole development process. Contractors must be briefed in biosecurity, and the risks of spreading invasive species, especially given the presence of ditches and other linear habitats. Suppliers must demonstrate awareness of the risks posed by INNS. In particular, any persons or equipment entering ditches and waterbodies must operate a strict check-clean-dry policy beforehand and afterwards. This is to prevent the accidental spread of invasive aquatic invertebrates and plants. Any tree surgeons on site must clean tools beforehand and afterwards, to prevent the spread of fungi and other tree pathogens.

As an enhancement, any INNS identified elsewhere on the prison estate (outside the development) should be targeted for removal.

## 5. References


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MHCLG (2021) *National Planning Policy Framework*. Ministry for Housing, Communities & Local Government, London.

## 6. Photographs

Plate 1 – B12 inside HMP Wymott.

Plate 2 – Portacabins inside HMP Wymott.

Plate 3 – General view inside HMP Wymott.

Plate 4 – Former assault course, HMP Wymott.

Plate 5 – Brown rat burrows, former assault course.

Plate 6 – Rough grass area in HMP Wymott.

Plate 7 – General view, HMP Wymott.

Plate 8 – Brown rat burrows, HMP Wymott.

Plate 9 – B10, moderate bat potential, barn owl present.

Plate 10 – B11 interior, with barn owl box on left.

Plate 11 – Barn owl pellet beneath box in B11.

Plate 12 – Fishing lake north of HMP Wymott.

Plate 13 – Sheep pasture with B10 in distance.

Plate 14 – Hawthorn hedgerow and ditch.

Plate15 – General view, looking south.

Plate 16 – Wooded bank on north edge of Wymott estate.

Plate 17 – Public gardens on west edge of Wymott estate.

Plate 18 – Public gardens on west edge of Wymott estate.

CGO Ecology Ltd 27a Ridgefield Gardens Christchurch Dorset BH23 4QG UK

# Invasive Non-Native Species survey for proposed new prison, bowling club, and boiler house on land adjacent to HMP Garth and HMP Wymott, Leyland

CGO Ecology Ltd

Christchurch

10th August 2021

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| 1 | 14/05/2021 | n/a |
| 2 | 20/07/2021 | Updated red line boundary/layouts. Additional survey data added (Himalayan balsam, Japanese rose, montbretia, giant rhubarb).Recommendations updated. |
| 3 | 05/08/2021 | Site name consistency modifications. |
| 4 | 10/08/2021 | Noted added re Himalayan balsam eradication plan. |

# Non-technical summary

*Introduction*

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct an Invasive Non-Native Species (INNS) survey at HMPs Garth and Wymott, Leyland, Lancashire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SD 502 205). The Local Planning Authority (LPA) is Chorley Council. A Preliminary Ecological Appraisal by Ramboll recommended an INNS survey.

*Methodology*

A thorough walkover was conducted by Dr Chris Gleed-Owen MCIEEM from 19-20th April 2021, to identify any stands of invasive plants and animals, especially along watercourses, ditches, hedgerows, field boundaries, and disturbed areas. A second walkover was conducted on 13-14th July 2021. The locations, species, and stand sizes of all INNS plants were recorded. The locations and species of any INNS animals were recorded.

*Results*

A localised infestation of Himalayan balsam is present on the north edge of the proposed new prison site. This is a Wildlife and Countryside Act 1981 (as amended) Schedule 9 species (illegal to plant or allow to spread in the wild). Isolated stands of giant rhubarb and montbretia are present near the existing bowling club in the new prison area. Isolated stands of Japanese rose are present in a hedgerow in the wider BNG area to the south of HMP Wymott. There are rows of non-native trees on site, and non-native ornamental shrubs. The only Schedule 9 animal observed was Canada goose.

*Conclusions and mitigation recommendations*

The MoJ has confirmed that an Eradication Plan will commence in September/October 2021 for Himalayan balsam and the other INNS plants recorded. A Biosecurity Plan must be in place throughout the development process, to prevent accidental or deliberate import or spread of INNS. This is especially important given the network of ditches connecting the site to the wider countryside

## Contents

## 1. Introduction

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice (MoJ), to conduct an Invasive Non-Native Species (INNS) survey to the south of HMPs Garth and Wymott, Leyland, Lancashire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SD 502 205). The Local Planning Authority (LPA) is Chorley Council.

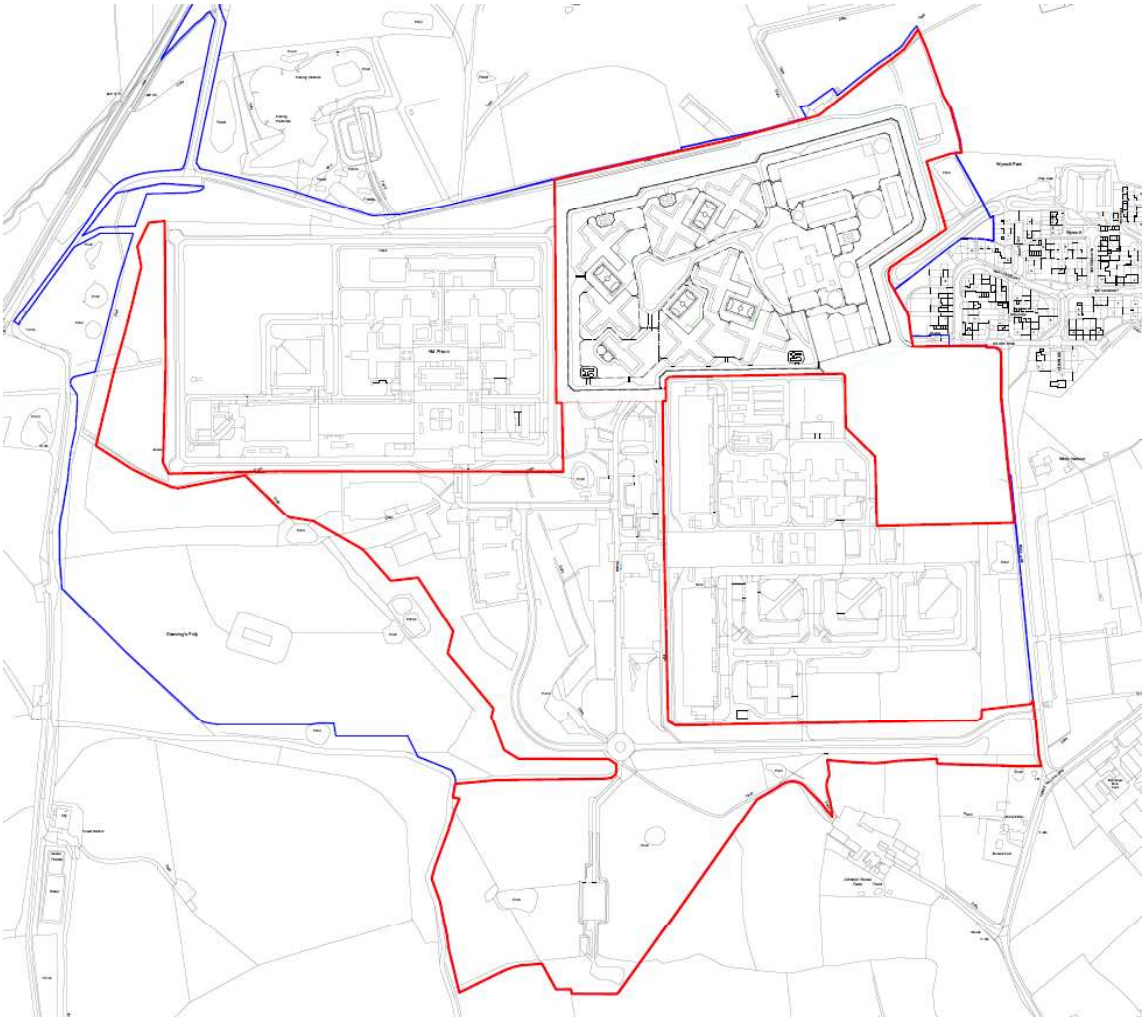

Figure 1 – Development site boundary (red line) and MoJ ownership boundary (blue line).

The Wildlife and Countryside Act 1981 (as amended) makes it illegal to plant, release, or allow to escape and spread, any plant or animal species listed on Schedule 9. Part I lists animals that are established in the wild, such as grey squirrel (*Sciurus carolinensis*). Part II lists plants that are established in the wild, such as the highly-damaging Japanese knotweed (*Fallopia japonica*), the fast-spreading riparian herb Himalayan balsam (*Impatiens glandulifera*), and uncontrolled ornamental shrubs such as rhododendron (*Rhododendron ponticum*). Many introduced species of trees and shrubs that are common in the British landscape are not considered invasive. The Schedule 9 list is regularly updated by Defra.

A Preliminary Ecological Appraisal (PEA) of most of the development area was conducted by Ramboll. The report (Molesworth, 2020) recommended a survey to map all stands of INNS plants on site. Two additional areas were added to the development red line in 2021, for which CGO Ecology conducted an additional PEA (Gleed-Owen, 2021).

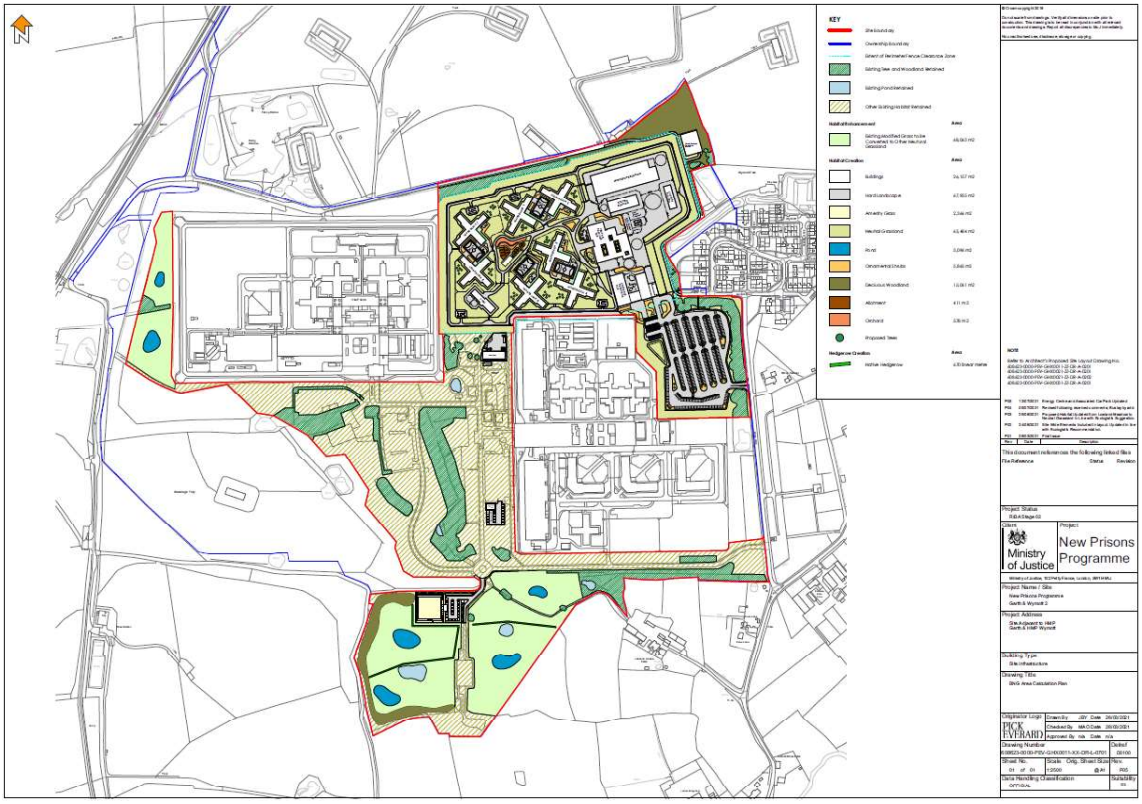


Figure 2 – Proposed development and landscaping plan, produced by Pick Everard.

## 2. Methodology

A thorough walkover of the whole development site and MoJ-owned land was conducted by Dr Chris Gleed-Owen MCIEEM from 19-20th April 2021, to identify any stands of INNS plants, especially along watercourses, ditches, hedgerows, field boundaries, and disturbed areas. A second walkover was made from 13-14th July 2021 in the peak growing season for the larger invasive plants, including the annuals. The locations, species, and stand sizes of all INNS plants were recorded. The locations and species of any INNS animals were also recorded.

The surveyor was Dr Chris Gleed-Owen BSc (hons) PhD MCIEEM, Director & Principal Ecologist of CGO Ecology Ltd, an ecological consultant since 2008 (13 years. Survey licences: CL09 great crested newt (GCN, *Triturus cristatus*), sand lizard (*Lacerta agilis*), smooth snake (*Coronella austriaca*), natterjack toad (*Epidalea calamita*), Roman snail (*Helix pomatia*). Previous mitigation licence-holder for smooth snake and/or sand lizard (6), and badger (*Meles meles*) sett closure (3). Experienced surveyor of Phase 1 habitats, National Vegetation Classification (NVC), flora (FISC level 4 botanist), vertebrates, and invertebrates. Results figure 3 was drawn by CGO Ecology GIS technician Jack Parker.

## 3. Results

The site is largely INNS-free, but a localised infestation of Himalayan balsam is present in the ditches on both sides of the east-west track along the north edge of the site (the north edge of the proposed new prison area). Himalayan balsam is a Wildlife and Countryside Act 1981 (as amended) Schedule 9 species (illegal to plant or allow to spread in the wild).

This infestation was not evident during the INNS survey in April 2021, but probably germinated around that time, and arose from seeds accidentally imported by the excavator used to clean the ditches in winter 2020/2021. With careless biosecurity, it can quickly infest a whole site.

By 20th June 2021, all ditches on site were thickly vegetated, but the area of Himalayan balsam was identified during a barn owl survey. Several small stands are present within the red line boundary, in the tree-line along the south side of the northern boundary track. These will be affected by the new prison development. Most of the infestation is outside the red line boundary and outside Ministry of Justice land, on land to the north of the site. The stands occupy the ditch for around 50m, with several isolated plants further west. It is also visible around a brick barn on land immediately north of the ditch.

Two stands of montbretia (*Crocosmia x crocosmiiflora*) and a small stand of giant rhubarb (*Gunnera tinctoria*) are present in a communal grassed area on Pump House Lane, east of the bowling club. Both are Schedule 9 species. This area will be lost to the new prison development.

Four Japanese rose (*Rosa rugosa*) bushes are present in a species-rich hedgerow in farmland within the red line to the south of HMP Wymott. This is also a Schedule 9 species. Notably, this section of hedgerow also contains two mature native black poplar (*Populus nigra betulifolia*) trees, a rare and protected species. This area will be retained as part of the widersite Biodiversity Net Gain (BNG) enhancements for the development.

The only Schedule 9 INNS species (illegal to release/plant or allow to spread in the wild) observed was Canada goose (*Branta canadensis*). A group of 10 were seen around a pond in the wider BNG site area to the south.

There are rows of non-native trees such as white poplar (*Populus alba*) on site, and hedges of non-native ornamental shrubs planted around the prison car parks and other well-managed areas.

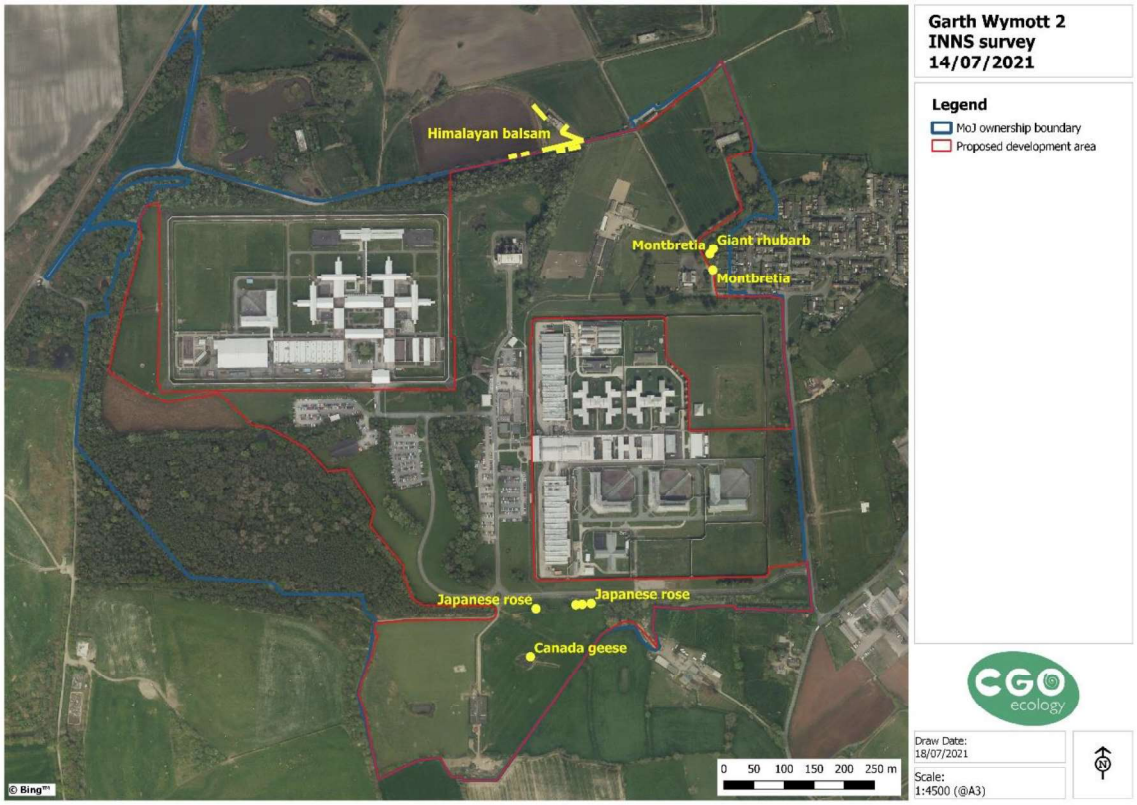


Figure 3 – INNS survey results, proposed development boundary (red line), and Ministry of Justice ownership (blue boundary).

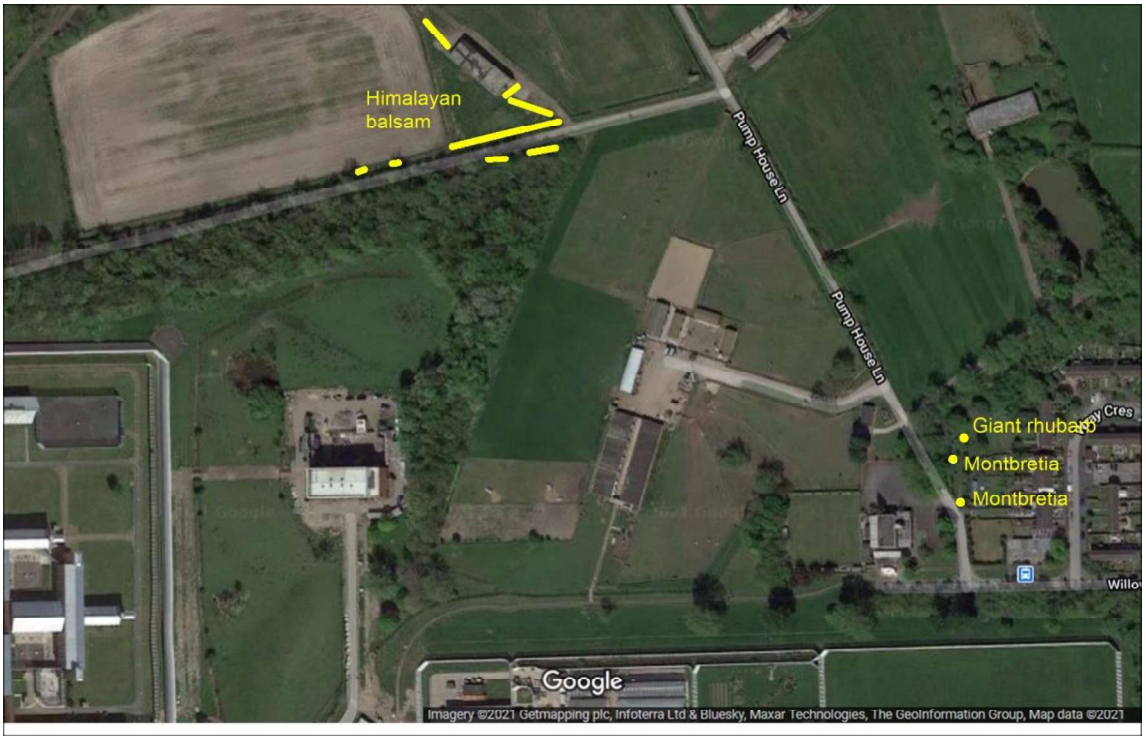


Figure 4 – Detail of Himalayan balsam infestation and other INNS plants within and adjacent to the proposed new prison site.

## 4. Conclusions and mitigation recommendations

Given that the site is largely free of INNS, the eradication of Himalayan balsam is achievable and imperative before it spreads any further. The MoJ has confirmed that it will undertake an Eradication Plan for Himalayan balsam in September/October. This will be completed before any woodland clearance or other disturbance that could spread it further. Himalayan balsam is a fast-growing annual that spreads by seed. It is best eradicated by hand-pulling, carried out before flowering occurs, over three consecutive years.

An eradication programme will also be enacted for the other Schedule 9 species as soon as possible. Arisings from the removal of INNS plants must be transported by a registered carrier to a controlled waste site. This must take place before any enabling works occur that could allow their spread.

A Biosecurity Plan must be in place to ensure that all contractors, suppliers, vehicles, boots, clothing, and other potential INNS vectors are INNS-free.

Many INNS plants and animals inhabit waterbodies and wet areas; therefore, any work in or near ditches, streams, and ponds must involve a check-clean-dry policy. This means that all boots, clothes, equipment, and vehicles must be checked, cleaned and dried when coming from another site with wet habitats, and before going to another site with wet habitats. Even small fragments of plant material or mud can transport INNS between sites, and begin new infestations.

Identification posters for key INNS plants must be prominently posted, and toolbox talks must be given to all site visitors.

Tree workers must clean chainsaws and other tools with suitable disinfectants before and after work on site, to prevent the spread of fungal and bacterial tree pathogens.

The site must be monitored regularly throughout the development process, to check for INNS.

## 5. References

Gleed-Owen, C. (2021) *Preliminary Ecological Appraisal for proposed new prison, bowling club, and boiler house on land adjacent to HMP Garth and HMP Wymott, Leyland.* CGO Ecology Ltd, Christchurch.

Molesworth, J. (2020) *Albatross & Razorbill. Preliminary Ecological Appraisal.* Ramboll, Exeter.

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# Reptile survey for proposed new prison, bowling club, and boiler house on land adjacent to HMP Garth and HMP Wymott, Leyland

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5th August 2021

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Deliverable: Reptile survey

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Version: 3

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Issued to: Mace Ltd. Anticipated circulation includes Mace internal use, Ministry of Justice, other appointed consultancies, Chorley Council, Natural England, and other relevant stakeholders.

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|---|---|---|
| 1 | 23/05/2021 | n/a |
| 2 | 26/05/2021 | Corrections to title page 2, surveyor names in section 2 and table 1. |
| 3 | 05/08/2021 | Corrections to site name consistency, updated refs, figures. |

# Non-technical summary

*Introduction*

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a reptile survey at HMPs Garth and Wymott, Leyland, Lancashire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SD 502 205). The Local Planning Authority (LPA) is Chorley Council. A Preliminary Ecological Appraisal by Ramboll recommended a reptile survey.

*Methodology*

An initial walkover was conducted by Dr Chris Gleed-Owen MCIEEM on 2nd February 2021, to identify all areas of habitat suitable for reptiles on site. This was followed by a set-up visit on 24th February 2021, to deploy artificial refugia (roofing felt mats 50cm x 30cm in size). 140 artificial refugia were laid in transects of 10, with a spacing of 5m between refugia. After several weeks, seven survey visits were conducted between 13th April and 18th May 2021, in suitable weather and times of day. Each visit involved a walkover of the whole site, visually searching for reptiles, and checking all 140 artificial refugia. The surveyors were Rachel Whitaker, Richard Else, Hazel Watson, and Chris Gleed-Owen, all experienced reptile ecologists.

*Results*

No reptiles were encountered on any of the survey visits. The only suitable habitat areas are narrow strips of rough grassland along hedgerows, ditches, field boundaries, and woodland edges. These habitats are relatively well connected, but there are no extensive areas of habitat suitable for reptiles, especially as much of the site is waterlogged during the colder months.

*Conclusions and mitigation recommendations*

Reptiles appear to be absent from the site, although grass snakes could be present at an undetectably-low level, occasionally passing through the site. Reptiles appear to be scarce in the local landscape. No reptile mitigation is required, and no enhancements are recommended.

## Contents

## 1. Introduction

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a reptile survey at HMPs Garth and Wymott, Leyland, Lancashire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SD 502 205). The Local Planning Authority (LPA) is Chorley Council.

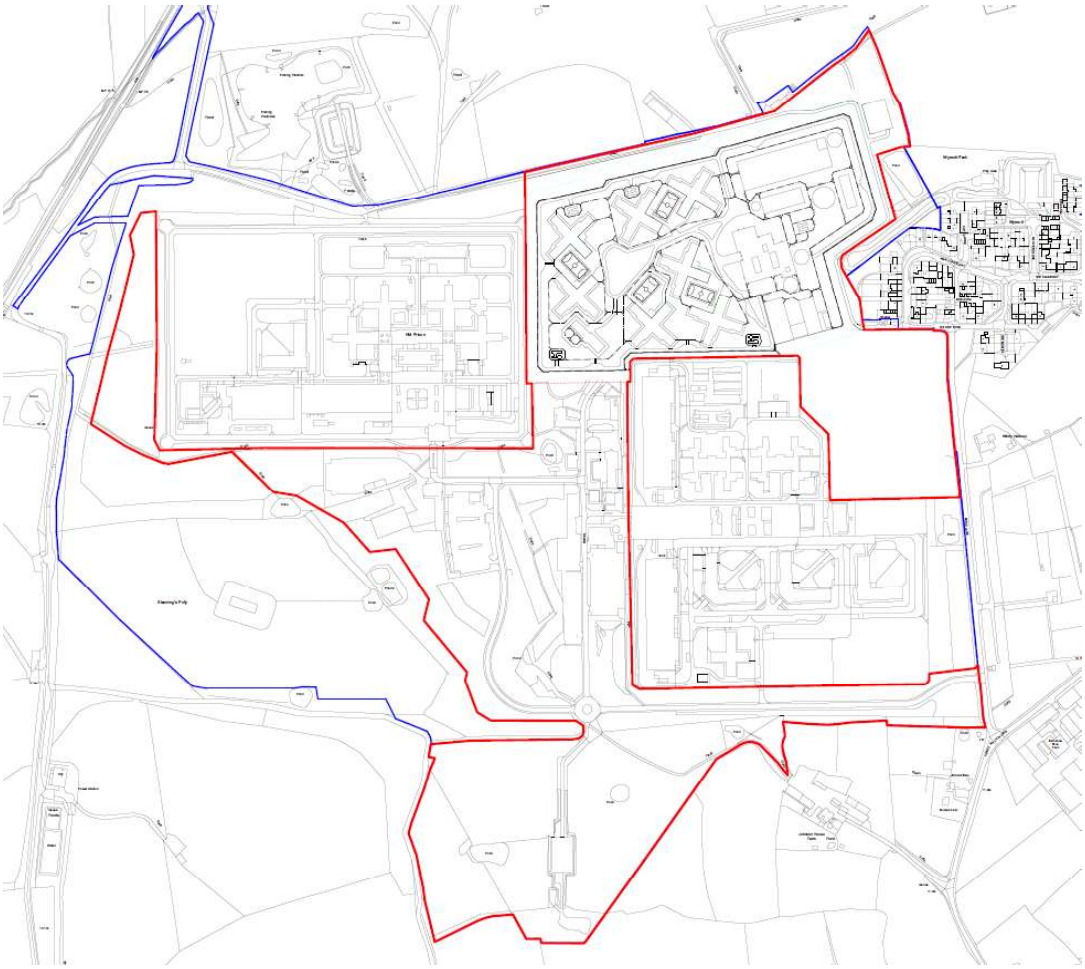

Figure 1 – Application area (red line) and MoJ ownership boundary (blue outline).

Reptiles are protected by the Wildlife and Countryside Act 1981 (as amended). A Preliminary Ecological Appraisal (PEA) conducted by Ramboll (Molesworth, 2020) included a 2km search with Lancashire Environment Record Network (LERN). This returned no reptile records, but a reptile survey was recommended nonetheless, as reptiles are often under-recorded in rural landscapes.

## 2. Methodology

An initial walkover was conducted by Dr Chris Gleed-Owen MCIEEM on 2nd February 2021, to identify all areas of habitat suitable for reptiles on site. This was followed by a set-up visit on 24th February 2021, to deploy artificial refugia (roofing felt mats 50cm x 30cm in size). 140 artificial refugia were laid in transects of 10, with a spacing of 5m between refugia.

After several weeks, seven survey visits were conducted between 13th April and 18th May 2021, in suitable weather and times of day. Each visit involved a walkover of the whole site, visually searching for reptiles, and checking all 120 artificial refugia. The surveyors were Rachel Whitaker, Richard Else, Hazel Watson, and Chris Gleed-Owen, all experienced reptile ecologists. On visits 1 and 3-7, two surveyors worked in parallel.

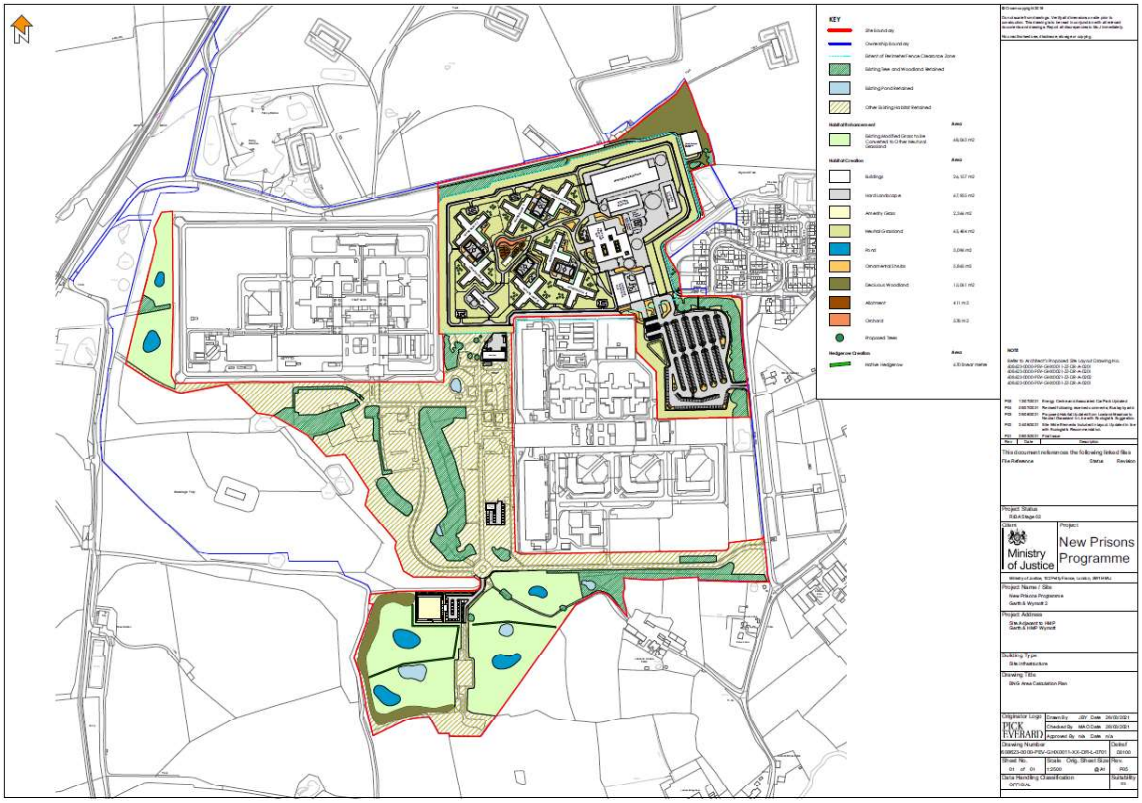


Figure 2 – Proposed development and landscaping, including habitat enhancements.

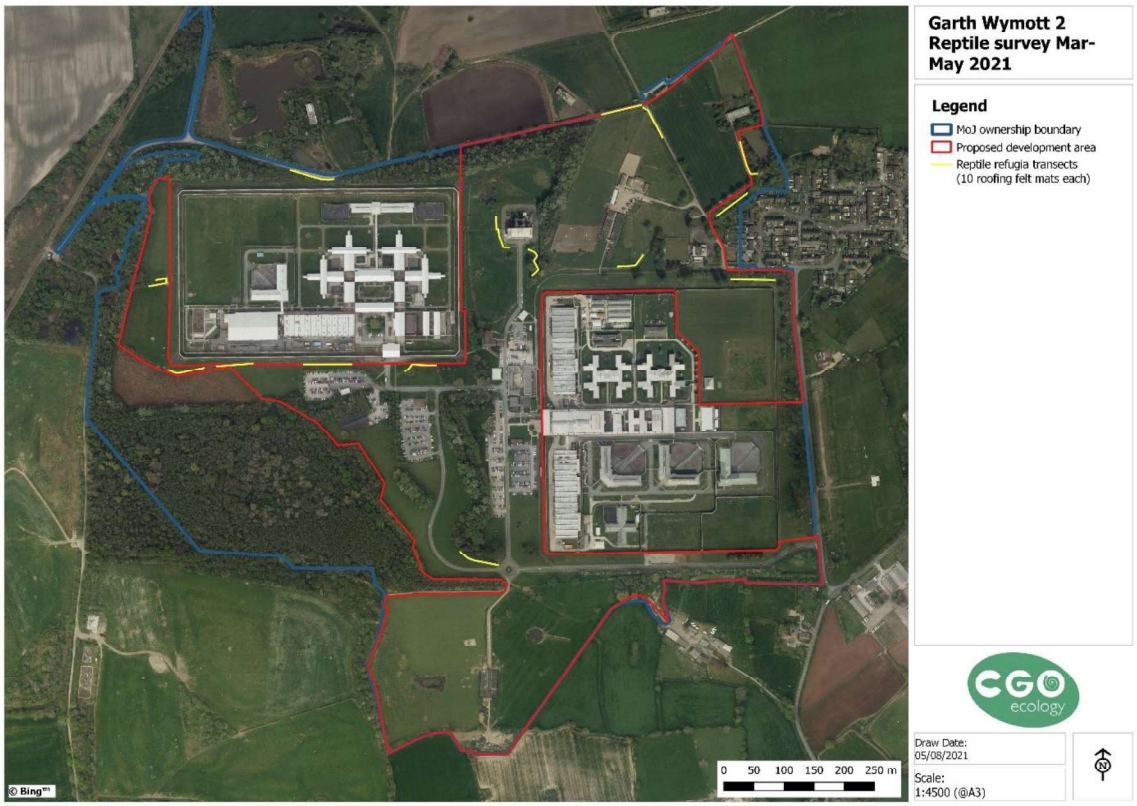


Figure 3 – Reptile survey artificial refugia transects (yellow lines), each with 10 artificial refugia.

The lead surveyor, Dr Chris Gleed-Owen BSc (hons) PhD MCIEEM, Director & Principal Ecologist of CGO Ecology Ltd, has been an ecological consultant since 2008 (13 years). He is trained in First Aid at Work, Fire Marshal, Asbestos Awareness, CDM Awareness, COSHH, Manual Handling, and Health & Safety Management. Survey licences: CL09 great crested newt (GCN, *Triturus cristatus*), sand lizard (*Lacerta agilis*), smooth snake (*Coronella austriaca*), natterjack toad (*Epidalea calamita*), Roman snail (*Helix pomatia*). Previous mitigation licence-holder for smooth snake and/or sand lizard (6), and badger (*Meles meles*) sett closure (3). Experienced surveyor of Phase 1 habitats, National Vegetation Classification (NVC), flora (FISC level 4 botanist), vertebrates, and invertebrates.

Survey effort and refugia density were consistent with widely-used guidance on reptile survey methods (Froglife, 1999; HGBI, 1998; Natural England, 2011). The vast majority of land on site is unsuitable for reptiles, being too short-grazed or mown, and/or too wet for much of the year.

Visits were conducted in appropriate conditions and times of day for reptile detection, which can broadly be defined as sunshine or partly cloudy weather with air temperature 10-20ºC, or warm overcast weather at 13-20ºC. Time of day was selected to suit the weather conditions, starting at least two hours after sunrise, and finishing at least one hour before sunset. Survey immediately after rain, or in the first sunshine after rain, is ideal for reptile detection.

It is also prudent to select a wide range of conditions and different times of day, in order to capture a comprehensive dataset. This may include unexpected anomalies in reptile behaviour, and idiosyncrasies of certain parts of a site, such as areas that only receive sun in the morning or evening.

The spring of 2021 has been unusually cold, wetter, and windier than usual. This has limited the number of days where reptile survey could take place. Peak temperatures were lower than usual, and often exceeded 10ºC (suitable for reptile activity) for only a few hours per day. However, the conditions selected for the seven surveys were sufficient for detecting reptile presence-absence, and on balance, this has not placed a limitation on the survey results.

The Phase 1 habitat maps were drawn by GIS technician Jack Parker of CGO Ecology.

| Surveyor | Visit | Date | Times | Weather |
|---|---|---|---|---|
| CGO | setup | 24/02/2021 | n/a | n/a |
| RW, RE | V1 | 13/04/2021 | 15:00-18:00 | 11C, 20-50% cloud, intermittent sun |
| CGO | V2 | 19/04/2021,<br>20/04/2021 | 15:00-19:00,<br>09:30-13:30 | 14-16C, 0% cloud, sunny;<br>12-14C, 0% cloud, sunny |
| RE | V3 | 26/04/2021 | 13:00-17:00 | 13-14C, 40-60% cloud, sunny intervals |
| RW, RE | V4 | 05/05/2021 | 13:30-16:30 | 10C, 50-70% cloud, sunny intervals |
| RW, RE | V5 | 07/05/2021 | 08:30-11:00 | 10C, 60-70% cloud, sunny intervals |
| RE | V6 | 10/05/2021 | 14:00-19:00 | 13-15C, 60% cloud, intermittent sun, recent rain |
| RE, HW | V7 | 18/05/2021 | 13:30-16:30 | 13-14C, 10% cloud, sunny |

Table 1 – Survey details. CGO = Chris Gleed-Owen, RW = Rachel Whitaker, RE = Richard Else, HW = Hazel Watson.

## 3. Results

No reptiles were encountered on any of the survey visits. The only suitable habitat areas are narrow strips of rough grassland along ditches, hedgerows and field boundaries, and some woodland edges. These strips of habitat are relatively well connected, but there are no extensive areas of habitat suitable for reptiles, especially given that much of the site is wet and/or waterlogged for much of the year.

Two amphibian species were recorded beneath reptile mats during the surveys: common toad (*Bufo bufo*) and common frog (*Rana temporaria*). Common toad was frequently recorded across the site; common frog was only recorded to the south and west of HMP Garth.

## 4. Conclusions and mitigation recommendations

Reptiles appear to be absent from the site. It is possible that occasional grass snakes pass through the site, at undetectably-low levels. The LERN search results suggest that reptiles may be absent from the area, although under-recording in rural areas can give a false impression of absence.

No reptile mitigation is required, and no targeted enhancements are recommended.

## 5. References


Froglife (1999). *Advice Sheet 10. Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife, Peterborough.

HGBI (1998). *Evaluating local mitigation/ translocation programmes: maintaining best practice and lawful standards.* Herpetofauna Groups of Britain and Ireland.

Molesworth, J. (2020) *Albatross & Razorbill. Preliminary Ecological Appraisal.* Ramboll, Exeter.

Natural England (2011). *Standing Advice Species Sheet: Reptiles*. Natural England, Sheffield.


## 6. Photographs

Plate 1 – Artificial refuge (roofing felt mat) on rough grass ditch margin to north of HMP Wymott.

Plate 2 – Reptile survey mats on narrow fringe of rough grass beside ditch to south of HMP Garth.

CGO Ecology Ltd 27a Ridgefield Gardens Christchurch Dorset BH23 4QG UK

# Bat roost surveys at HMPs Garth & Wymott, Leyland, Lancashire, for Ministry of Justice New Prisons Programme

CGO Ecology Ltd

Christchurch

6th August 2021

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| P04 | 06/08/2021 | Corrections to site name consistency, updated refs. |

# Non-technical summary

*Introduction*

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a series of bat emergence/re-entry surveys of potential roosts at HMPs Garth and Wymott, Leyland, Lancashire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SD 502 205). The Local Planning Authority (LPA) is Chorley Council.

*Methodology*

Haycock and Jay Associates Ltd undertook the surveys and wrote this report as subconsultants for CGO Ecology Ltd. Karl Harrison MCIEEM conducted a Preliminary Roost Assessment (PRA) on 24th February 2021, guided by a Preliminary Ecological Appraisal by Ramboll Ltd. In May to June 2021, dusk emergence and dawn re-entry surveys were undertaken at 11 buildings and one tree identified as having bat roost suitability, following standard guidelines. In addition, a Vantage Point Survey (VPS) was undertaken at a known common pipistrelle maternity roost, to determine the commuting direction of emerging bats. The surveyors were Rachel Whitaker, Richard Else, and Hazel Watson, all suitably experienced, with full-spectrum electronic detectors.

*Results*

The nocturnal surveys identified two buildings containing bat roosts. B15, a Probation Service office, supports a common pipistrelle maternity roost. B10, a farm building, supports a common pipistrelle day roost. The VPS confirmed that nearly all bats emerging from B15 commute south, away from the new prison and boiler house developments. Therefore, their foraging habitats will not be impacted.

Buildings B15 and B10 will be retained, but they will be in close proximity to development, and potential impacts include disturbance from increased levels of noise, vibration and artificial lighting during the construction and operational phase.

*Conclusions, mitigation and enhancement recommendations*

Mitigation measures will include timing works to avoid the May-August maternity period, design of lighting schemes to avoid light spill onto roosts and commuting routes, and production of a Construction Environmental Management Plan.

Batboxes and enhancement measures such as large areas of new habitat creation will ensure there is no negative significant residual effects on bats roosting at B15 and B10.

Bats using the site for foraging and/or commuting will be dealt with in a separate activity survey report.

## Contents

# 1. Introduction

## 1.1. Background

CGO Ecology Ltd (CGO) was instructed by Mace Ltd, on behalf of the Ministry of Justice (MoJ), to conduct a series of bat dusk emergence and dawn re-entry surveys of potential roosts at HMPs Garth and Wymott, Leyland, Lancashire. The MoJ proposes a new prison, boiler house, and bowling club as part of its New Prisons Programme on land centred on (SD 502 205). The Local Planning Authority (LPA) is Chorley Council.

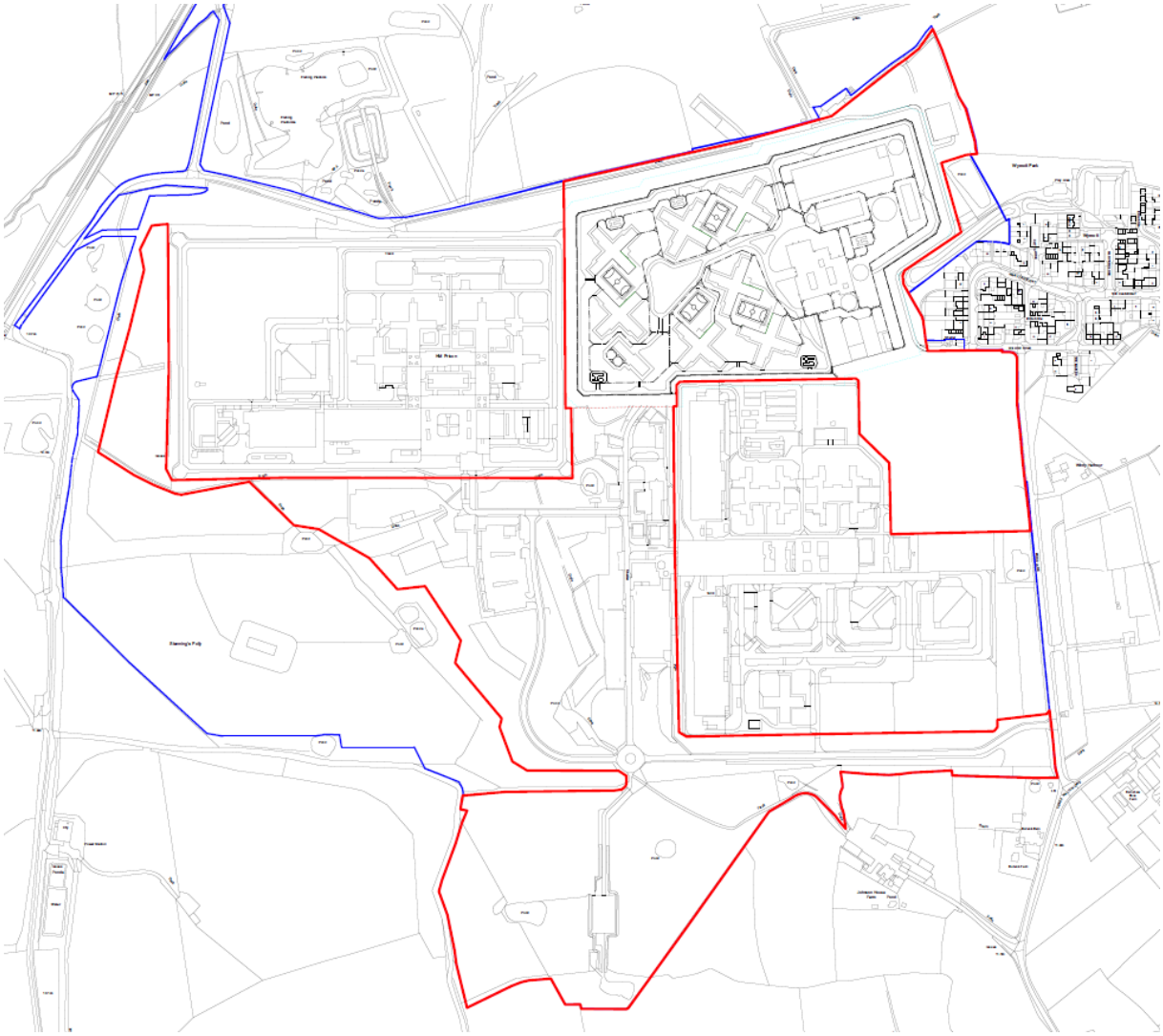

Figure 1 – Development site boundary (red line) and MoJ ownership boundary (blue line).

All UK bats and their roosts are protected by the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations 2017 (as amended). Bats may roost in crevices in building roofs, loft voids, and other built features, or in trees and other natural cavities.

A Preliminary Ecological Appraisal (PEA) conducted by Ramboll (Molesworth, 2020). Additional areas were subjected to a PEA by CGO (Gleed-Owen, 2021a). An Ecological Impact Assessment (EcIA) has already been conducted by CGO (Gleed-Owen, 2021b). Bat roost surveys of woodland areas are ongoing, and an updated EcIA will be produced in due course.

Natural England has issued 16 European Protected Species (EPS) mitigation licences within 5km. Eight of these were for bats, the nearest being 400m south for common pipistrelle (*Pipistrellus pipistrellus*). The others are for common pipistrelle and/or brown long-eared bat (*Plecotus auritus*), with one also including Brandt's bat (*Myotis brandtii*) 4.3km north.

A Lancashire Environment Record Network (LERN) search yielded 33 bat records within 2km, comprising common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*), Brandt's bat, brown long-eared bat, and unidentified bats. The records include roosts for both pipistrelle species within 2km.

Haycock and Jay Associates Ltd (HJA) was commissioned to carry out the surveys as subconsultant to CGO. Karl Harrison MCIEEM (Natural England level 2/CL18 bat licence) of HJA is the lead surveyor, and lead author of this report, acting as an Associate Ecologist to CGO.

Dr Chris Gleed-Owen MCIEEM is Director and Principal Ecologist of CGO, and project manager for the Garth Wymott 2 phase 2 ecological surveys.

This report aims to follow CIEEM (2017) guidance, and provide sufficient information to assist an EcIA conforming to CIEEM (2018) guidance.

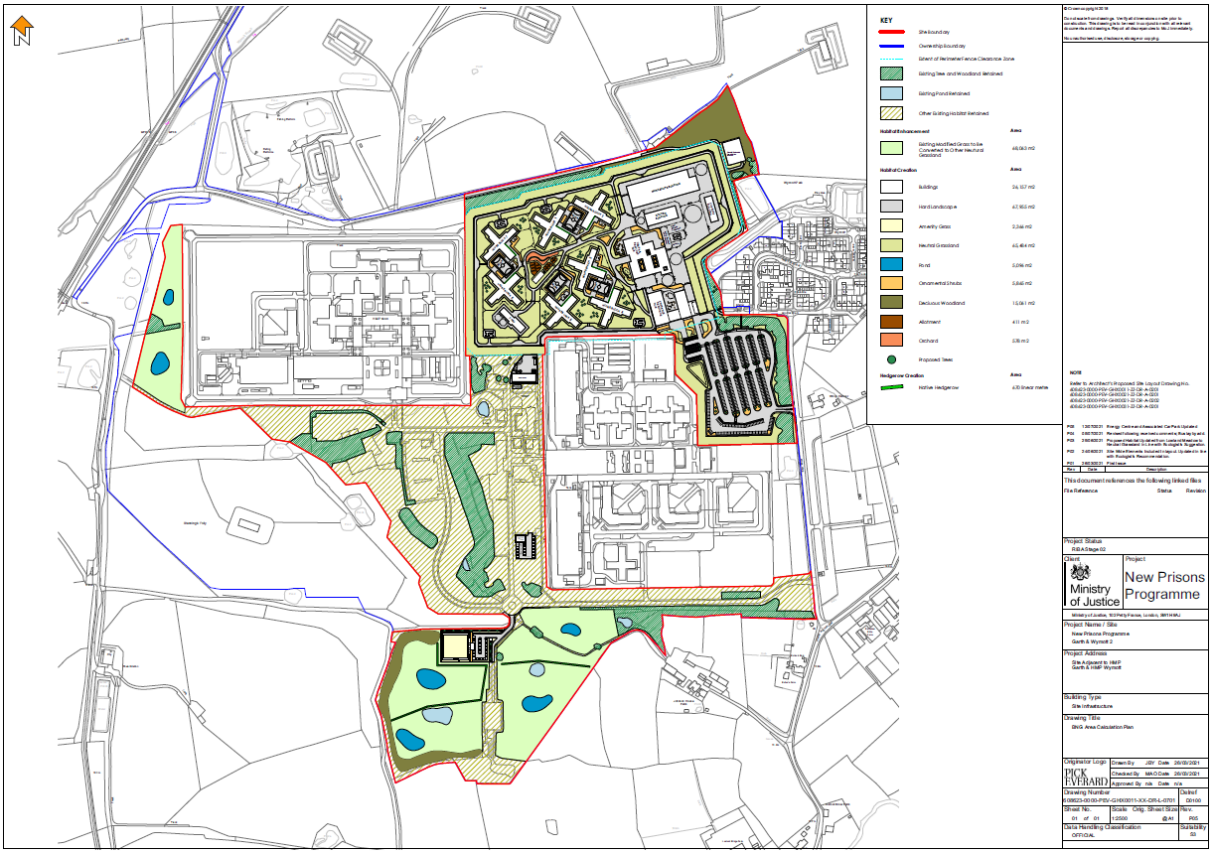


Figure 2 – Proposed development and landscaping plan, with habitat areas for BNG purposes, produced by Pick Everard.

### 1.2. Site context

The development site comprises predominantly land north of HMP Wymott, currently used as a sheep (*Ovis aries*) farm, stables, bowling club, boiler house, and utility buildings. The part within HMP Wymott is a sports field and disused assault course. The new boiler house will be between the existing prisons. The new bowling club will be on farmland to the south. Some woodland will be lost for the new prison development. Larger areas of woodland will remain.

The surrounding area is intensively farmed for a mixture of livestock and arable crops, but there are significant areas of woodland and other land uses. A large area of woodland lies to the southwest of the site, extending around the west and north of HMP Garth. There are major urban areas to the northeast (Leyland and Preston), and a network of minor roads, railway lines, villages, hamlets, and farms in all directions.

### 1.3. Proposed works

The proposed development is a hybrid planning application seeking: Outline planning permission (with all matters reserved except for access, parking and landscaping) for a new prison (up to 74,531.71m$^2$) within a secure perimeter fence following demolition of existing buildings and structures and together with associated engineering works; Outline planning permission for a replacement boiler house (with all matters reserved except for access); and Full planning permission for a replacement bowling green and club house.

## 2. Methodology

### 2.1. Preliminary Roost Assessment

On 24th February 2021, HJA conducted bat Preliminary Roost Assessment (PRA) of buildings and trees identified by Ramboll (Molesworth, 2020) as requiring nocturnal survey. The Ramboll recommendations were modified to reflect the PRA findings. The PRA survey personnel were: Karl Harrison MCIEEM (Natural England CL18 licence 201732750-CLS-CLS) and Will Steele ACIEEM (CL17 licence 2019-43393-CLS-CLS).

The inspections were carried out during daylight hours and in accordance with standard methodology (Collins, 2016). The external inspection was undertaken with the aid of a powerful torch (Cluson Clulite Clubman, one million candle power) and close-focus binoculars from ground level. Internal inspections of buildings were not undertaken.

Cavities, cracks, and crevices which may offer potential emergence points or suitable roosting features for bats were identified and, where accessible, where also searched. In addition, the inspection recorded any evidence of use by bats, including feeding remains, claw marks, staining from urine and fur, droppings or bats themselves.

Features at the buildings and trees with opportunity for roosting were recorded and categorised according to their level of suitability, from negligible to high (cf. Collins, 2016). Suitability was determined by factors including type, size, and locations of features; site context, local environmental conditions, and proximity to suitable bat foraging habitat. The PRA was conducted in line with published Covid-19 advice (BCT, 2020; CIEEM, 2020; IUCN, 2020).

### 2.2. Emergence/re-entry surveys

Between 11th May and 10th June 2021, dusk emergence and dawn re-entry surveys were conducted on 11 buildings and one tree in the Zone of Influence (ZOI), totalling 50 surveyor sessions. This was to determine bat roost presence-absence, and characterise roosts, as per standard survey guidelines (Collins, 2016). Surveyors were positioned to observe potential bat emergence and re-entry points on buildings and trees. The lead bat surveyor was Karl Harrison MCIEEM (Natural England CL18 2017-29880-CLS-CLS), with assistance from experienced bat surveyors: Will Steele ACIEEM (Natural England CL17 licence 2019-43393-CLS-CLS), Rachel Whitaker, Emma Sutton, Richard Else, and Hazel Watson. The surveys were conducted in line with published Covid-19 advice (BCT, 2020; CIEEM, 2020; IUCN, 2020).

Surveys were carried out in accordance with the current methodology (Collins, 2016) with the aid of full-spectrum bat survey and monitoring equipment to record bats in the field. Equipment used included: Anabat Scout full spectrum bat detector; Pettersson M500-384 full spectrum recorders; Anabat Express and Anabat Swift passive recorders; Batbox Duet heterodyne bat detectors.

Full-spectrum and time-expansion calls were later analysed manually using Kaleidoscope Viewer software by Wildlife Acoustics. Where possible, calls were identified to species level. Zero cross calls were analysed manually using AnalookW software.

Surveys were carried out from surveyor positions spread around the buildings and tree, as detailed in Appendix 2, to provide full visual coverage of potential bat entry/exit points.

Any sightings of bats emerging from and/or returning to the buildings, bat activity/behaviour (where visible), and targeted bat calls suggesting a particular interest in features at the buildings/walls/structure, were recorded.

The full results, dates, times, sunset/sunrise times, and weather conditions are provided in Appendix 2.

### 2.3. Vantage Point Survey

A Vantage Point Survey (VPS) was conducted at building B15 (Probation Service offices) with two surveyors positioned on 22nd June 2021. This was in order to ascertain the commuting direction of bats emerging from the common pipistrelle maternity roost in B15. The survey comprised a VP to the north of B15, and one to the south (see Appendix 3). These were positioned to enable observation of the direction that emerging bats commuted.

The surveyors were Karl Harrison MCIEEM (Natural England CL18 licence 2017-29880-CLS-CLS) and Will Steele ACIEEM (Natural England CL17 licence 2019- 43393-CLS-CLS). Full survey details are provided in Appendix 3.

### 2.4. Interpretation and evaluation of results

Where roosts have been identified, these have been categorised according to the main bat roost types listed in the Natural England European Protected Species (EPS) mitigation licence application form, and in accordance with current guidelines. This information has been used to assess potential impacts of the proposed development and to design suitable mitigation.

### 2.5. Incidental observations

Sightings of notable wildlife observed during the bat emergence/re-entry surveys were also recorded. In particular, sightings of barn owl (*Tyto alba*) have been fed into the relevant survey for that species. Hedgehog (*Erinaceus europaeus*) was also observed on one survey.

### 2.6. Limitations

Internal inspections of buildings were not undertaken. However, this was considered when assessing bat roost suitability.

Suboptimal weather occurred on 10th and 25th May 2021, comprising brief periods of light rain during the survey. However, bat activity did not appear to be negatively affected by the change in weather conditions.

Technical malfunctions of bat detectors occurred on 19th and 20th May 2021, which meant that bat calls were not recorded for a single position on each occasion. However, adjacent surveyors' equipment was functioning on both occasions, and results were successfully corroborated. Therefore, no loss of information was experienced.

Lines of sight for buildings B5 and B6 were slightly obscured, although VPs were selected to maximise visibility of potential roost entry/exit features. No bat behaviour indicating roosting was observed for either building; therefore, no emergences or re-entries have been missed.

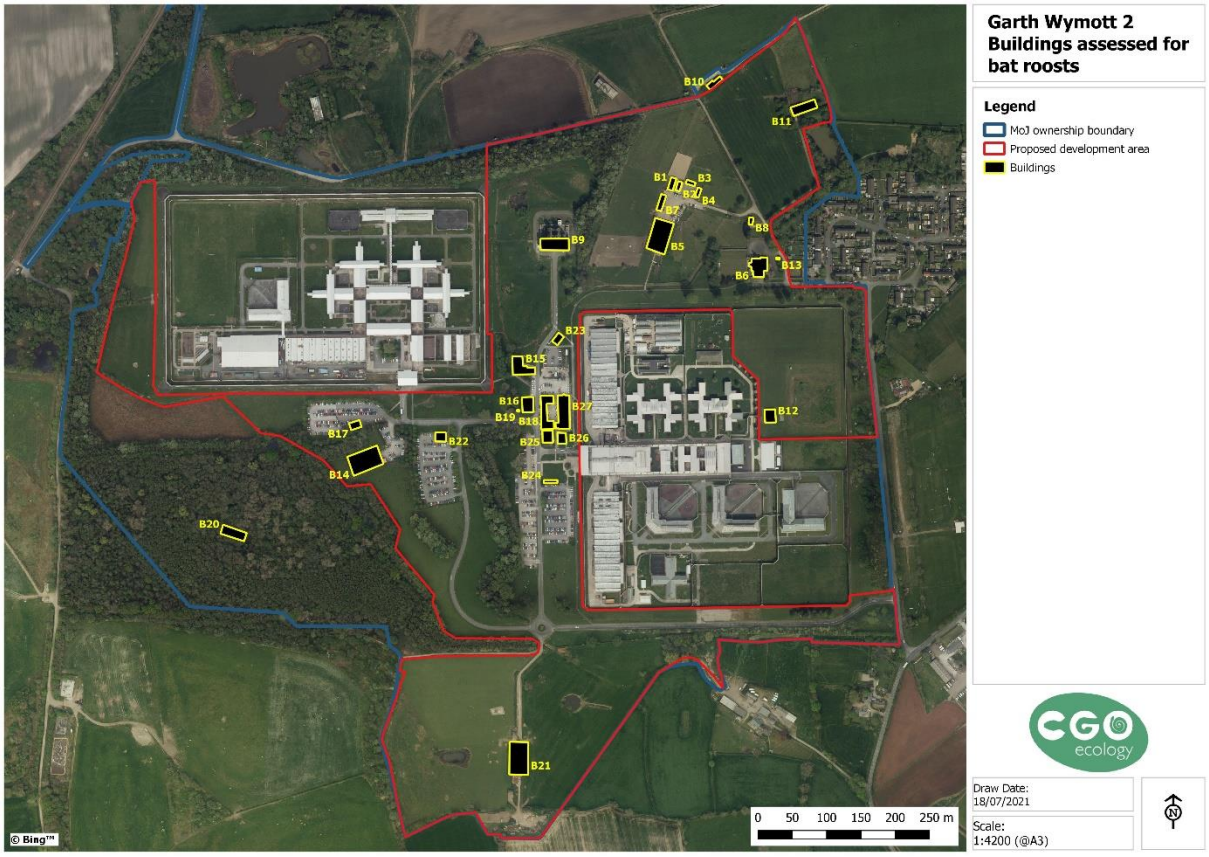


Figure 3 – Buildings within and outside red line boundary. B1-13 and B15 are within the ZOI and were subjected to PRA.

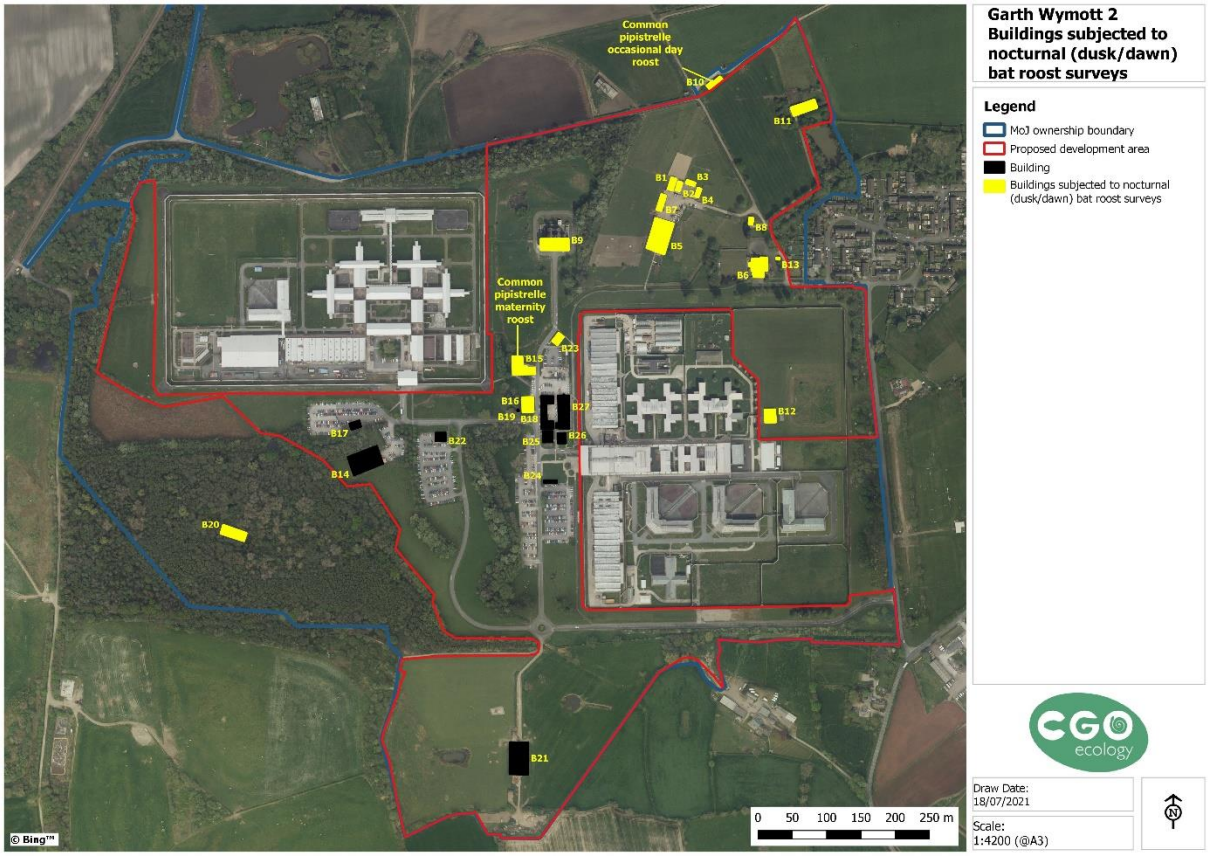


Figure 4 – Buildings graded negligible to high roost potential. Those within the ZOI with low, medium, or high potential were subjected to nocturnal surveys (dusk emergence, dawn re-entry) for bats in May/June 2021.

## 3. Results

### 3.1. Preliminary Roost Assessment

3.1.1. Buildings B1-B4

See also photographs in Appendix 1. B1-4 are four single-storey wooden stables (Photos 1 and 2) with concrete tiled apex roofs. Wooden soffits are present at overhanging eaves and walls are clad within wooden panelling. Open windows and stable doors are present. Internally rooms are used as stables and storage. The underside of the roof is lined with bitumen felt, and the roof is supported by a wooden truss structure (Photo 3). There is no enclosed roof space. Gaps are present between and beneath tiles and at the underside of wooden soffits. Buildings B1-B4 were assessed as being of low bat roost suitability.

3.1.2. Building B5

A single-storey agricultural building comprising two single shallow pitched animal and storage sheds with a gap between (Photos 4, 5 and 6). The building is constructed of brick supporting a concrete roof, the roof is covered in bitumen roofing felt. Large open doorways and windows are present. There is no enclosed roof space. Gaps are present beneath areas of lifted roofing felt and in areas where mortar is missing. Access internally is provided by open doorways and windows. B5 was assessed as being of low bat roost suitability.

3.1.3. Building B6

A single and two-storey brick building (Photos 7 and 8), with a predominantly flat roof. Visible areas of roof appear to be lined with a plastic material. A small parapet is present. All windows and doors are covered with metal shutters/sheets. Small areas of wooden cladding are present above doors and windows. Small gaps in mortar are present in brickwork and the roof covering has small gaps at the parapets. B6 was assessed as being of low bat roost suitability.

3.1.4. Building B7

A plastic polytunnel housing chickens (*Gallus gallusdomesticus*), with negligible bat roost suitability.

3.1.5. Building B8

A single-storey brick electricity substation (Photo 9). It has a flat concrete roof lined with plastic. The building is well-sealed, except for small gaps in the concrete roof, and gaps between wooden slats in louvered windows. B8 was assessed as being of low bat roost suitability.

3.1.6. Building B9

A large boiler house building constructed of brick (Photos 10 and 11). A higher section appears to be constructed from, or clad with, a metal/plastic material, and has a shallow apex roof. Lower roof sections are flat, but the roofing material cannot be identified from ground-level. Large metal louvered vent/doors are present at the south aspect. Metal pipework and staircase are present at the north aspect. The building is in good condition, except for small gaps in brickwork at the top and bottom of walls, and where pipework enters/exits brickwork. B9 was assessed as being of low bat roost suitability.

3.1.7. Building B10

A brick agricultural storage building (Photos 12 and 13), with an apex roof covered with concrete asbestos corrugated panelling. A lower concrete flat-roof section is present at the north aspect. Guttering is fixed into brickwork and eaves appear to be open. The west gable is

rendered, and a large metal shutter door is present at the east aspect. Grilled open windows are present on all aspects. The building has numerous features which provide access internally and may support roosting themselves. B10 was assessed as being of moderate bat roost suitability. The building was built as an engine shed to house steam locomotives.

### 3.1.8. Building B11

An animal shed (Photo 14). A metal framed building supporting a concrete roof, walls comprise a single skin of brick. There is no enclosed roof space. No features suitable for use by roosting bats were observed, and the building was assessed as being of negligible bat roost suitability. A barn owl box and barn owl pellets were observed within the building.

### 3.1.9. Building B12

B12 was assessed by CGO as part of the PEA of additional areas (Chris Gleed-Owen, 2021a). A single-storey modern brick-built office/classroom building with a hipped metal roof, located within HMP Wymott. It has tight soffits and no gaps wide enough for bats. B12 was assessed as having negligible bat roost suitability.

### 3.1.10. Building B13

A small brick building with a plastic material covered flat roof (Photo 15). Wooden cladding is present at the top of the wall and is in poor condition. Gaps behind wooden cladding may provide access internally or offer suitability themselves. Building B13 is assessed as being of low bat roost suitability.

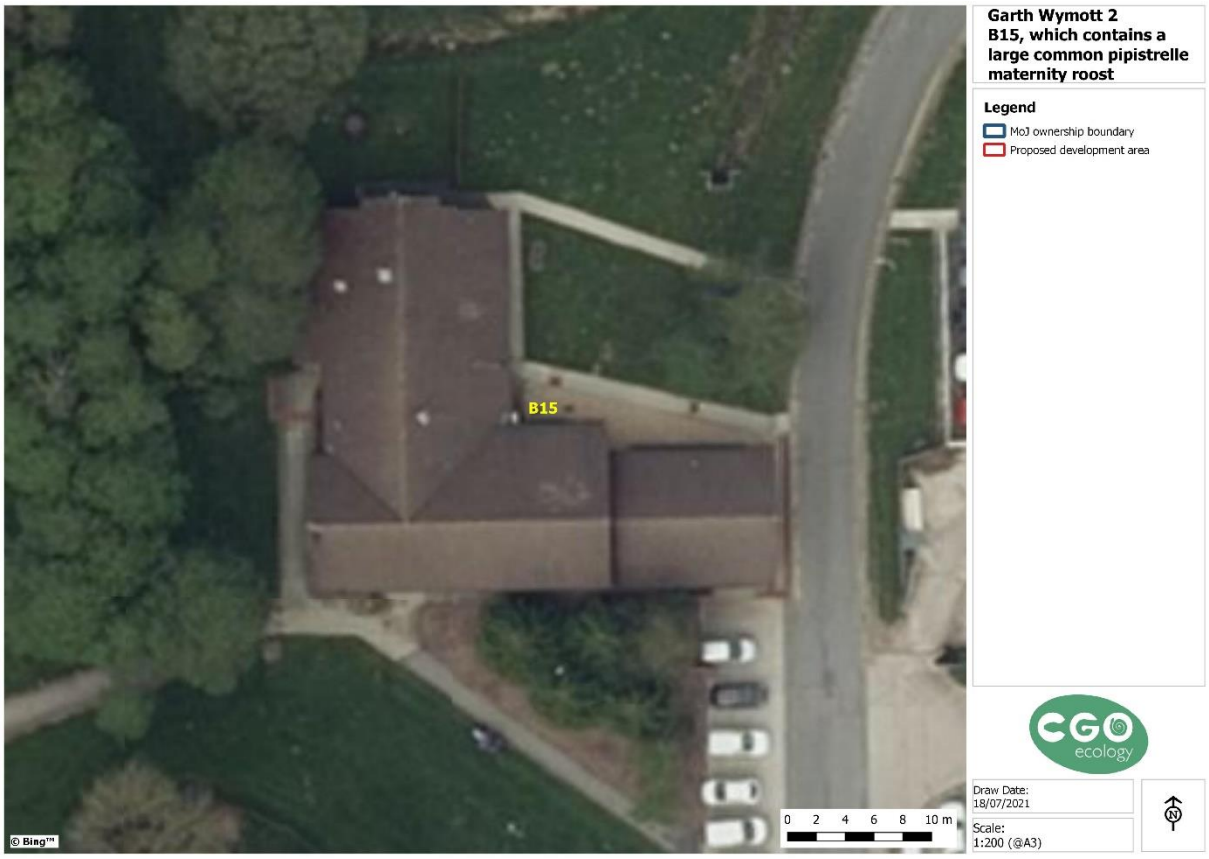


Figure 5 – Building 15 (common pipistrelle maternity roost). The new boiler house will be located to the east of B15.

### 3.1.11. Building B15

An L-shaped single-storey brick building with apex roof (Photos 16 and 17). The roof is covered with concrete tiles, it has overhanging eaves with large wooden boxed soffits. A small section of wooden cladding is present between differing height roof sections. Plastic-framed (uPVC) windows and doors are present on all aspects. The building is in good condition, except for gaps behind the wooden soffits. Records of a common pipistrelle maternity roost were highlighted in the Ramboll PEA (Molesworth, 2020). Tens of scattered bat droppings were visible below soffits around much of the building during the PRA. B15 is therefore treated as a confirmed roost. It is located near the proposed boiler house; therefore, it must be surveyed to assist in determining potential impacts.

### 3.1.12. Building B23

Three small single-storey portacabin buildings, constructed of metal and plastic. These are of negligible bat roost suitability.

### 3.1.13. Other buildings

B14 and B16-22 were deemed to be outside the ZOI of the development, and therefore did not require PRA and follow-up nocturnal surveys.

### 3.1.14. Tree T3

See figure 6. A mature ash (*Fraxinus excelsior*) tree located in a field. Several areas of damage and split wood features were observed from ground level. As such, T3 was assessed as being of at least moderate bat roost suitability.

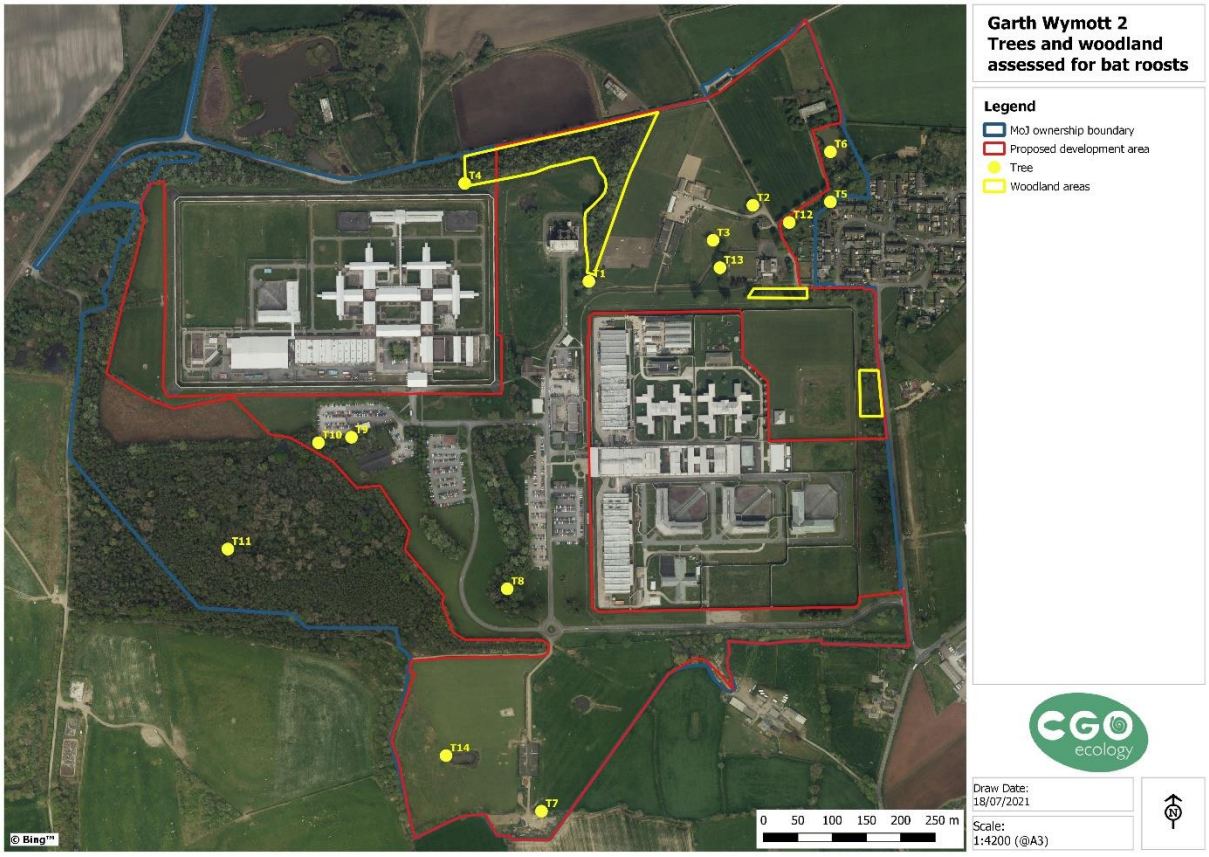


Figure 6 – Woodland and individual trees subjected to a bat PRA survey in 2021.

3.1.15. Ongoing surveys

A PRA, climbed aerial assessments, and emergence/re-entry surveys are ongoing at additional woodland areas and isolated trees. See figure 6. These are due to be completed in August 2021, and will be reported separately.

| Building | Roost | Species | Maximum count | Roost location(s) | Access point(s) |
|---|---|---|---|---|---|
| B10 | R1 | Common pipistrelle | 1 | Gable eaves, west elevation | Fascia |
| B15 | R1 | Common pipistrelle | 128 | Gable eaves, west elevation | Soffit |
| | R2 | Common pipistrelle | 22 | Gable eaves, north elevation | Soffit |
| | R3 | Common pipistrelle | 4 | Gable eaves, east elevation | Soffit |

Table 1 – Summary of PRA and emergence/re-entry survey results for B10 and B15.

## 3.2. Emergence/re-entry surveys

3.2.1. Overview and limitations

Bat surveys identified bat roosts within Building B15 and Building 10. No emergences and/or re-entries were observed at any other building or tree T3. A summary of the roosts identified is provided in table 1. Full details, results, photographs, and roost descriptions from all surveys are provided in Appendix 2. A summary of activity recorded on each survey occasion is given in the sections below, in chronological order.

Bat calls rapidly deteriorate as they move through the atmosphere. Calls which are at a distance or of low intensity are particularly affected, and features key to species identification may be lost. Bat calls which cannot be reliably identified to taxon or species level have been recorded as “unidentified” bat species.

3.2.2. Building B15 - 10th May 2021 (dusk)

Three confirmed bat roosts were identified at soffits around the building. Four entry points were identified at roost one (R1), on the western gable. 128 common pipistrelles emerged from R1. Five emerged from roost two (R2) located at the northern gable, assumed to be common pipistrelle. One unidentified bat emerged from roost three (R3) located at the eastern gable, also assumed to be common pipistrelle. Continuous foraging and regular passes recorded by common pipistrelle.

3.2.3. Tree T3 – 11th May 2021 (dawn)

No bat roost identified. Infrequent passes by common pipistrelle and one individual common pipistrelle seen commuting past tree.

3.2.4. Building B4 – 11th May 2021 (dawn)

No confirmed bat roosts identified. Limited activity recorded, except infrequent passes by individual common pipistrelle.

3.2.5. Building B10 – 18th May 2021 (dusk)

At least one common pipistrelle emerged from roost (R1) in building, exiting from the west gable end near the apex of the roof. A metal fascia exists at this point. At least eight noctules (*Nyctalus noctula*) were recorded commuting southeast to northwest, high over the building between 21:27 and 21:45, and at least one common pipistrelle was foraging around the building from 21:48 onwards. One pass by a *Myotis* species was also recorded.

3.2.6. Building B9 – 19th May 2021 (dawn)

No confirmed bat roosts identified. No bat activity recorded, except one brief pass by an individual unidentified pipistrelle.

3.2.7. Building B1 – 19th May 2021 (dusk)

No bat roosts identified. Frequent passes from individual commuting common pipistrelle, from east to west over the building. Infrequent foraging also recorded by common pipistrelle around the building.

3.2.8. Building B2 – 19th May 2021 (dusk)

No confirmed bat roosts identified. Frequent passes by commuting common pipistrelle, flying from east to west over building. Occasional foraging observed around the building by common pipistrelle.

3.2.9. Building B8 – 20th May 2021 (dawn)

No confirmed bat roosts identified. Occasional passes, mostly heard not seen by individual common pipistrelle. Occasional commuting recorded by common pipistrelle from east to west and west to east, over the building.

3.2.10. Building B13 – 20th May 2021 (dawn)

No confirmed bat roosts identified. Infrequent calls, mostly heard and not seen, by individual common pipistrelle. Common pipistrelle seen flying over building, heading north.

3.2.11. Tree T3 – 25th May 2021 (dusk)

No confirmed bat roost. Limited activity was recorded. An individual common pipistrelle was recorded flying east to west passed the tree and one common pipistrelle was recorded foraging. Three potential Nathusius' pipistrelle (*Pipistrellus nathusii*) calls were recorded (peak frequency 40-42kHz). However, these were only a few pulses per recording, and the species identification is not conclusive.

3.2.12. Building B6 – 25th May 2021 (dusk)

No confirmed bat roosts identified. Occasional passes by commuting and foraging common pipistrelle. Common pipistrelle seen commuting over the car park from north west to east.

3.2.13. Building 3 – 25th May 2021 (dusk)

No confirmed bat roosts identified. Frequent passes from commuting common pipistrelle, heading towards nearby woodland to the west.

3.2.14. Building B15 - 26th May 2021 (dawn)

Three bat roosts were identified at soffits. Roost one (R1) was identified at the west gable, 11 common pipistrelles entered. Roost two (R2) was identified at the north aspect of the building. 15 common pipistrelles entered. Roost three (R3) was identified at the east gable. One common pipistrelle entered. Regular passes from commuting and foraging common pipistrelle was recorded. Swarming activity at both R1 and R2 by common was also recorded.

3.2.15. Building 6 – 7th June 2021 (dusk)

Up to three common pipistrelles were observed continuously foraging around B5, and hedgerow to the north. Occasional passes by noctule were also heard.

3.2.16. Building 10 – 8th June 2021 (dawn)

No roosting activity observed. Occasional passes by common pipistrelle and noctules.

3.2.17. Building 5 – 8th June 2021 (dusk)

No roosts were confirmed at the building. Constant foraging activity in the yard between the two doors was observed during most of the survey by common pipistrelle, with occasional noctule and unidentified bats. A barn owl was perched on the fence to the east of B5. A tawny owl (*Strix aluco*) was also heard calling.

3.2.18. Building 5 – 9th June 2021 (dawn)

No roosts were confirmed at the building. Constant foraging activity in the yard between the two doors was observed during most of the survey by common pipistrelle, with occasional noctule and unidentified bats. A barn owl was sat on the field fence to the east of B5.

3.2.19. Building B15 – 9th June 2021 (dusk)

Seven roosts were confirmed at the building at soffits. Constant foraging activity around the building along tree lines was observed during most of the survey, along with social calls, swarming and bats chasing each other. A barn owl was seen near B15.

3.2.20. Building B10 – 21st June 2021 (dusk)

No bat roosting activity was observed. Noctules were seen foraging over the fields to the north. Occasional common pipistrelle activity. This survey was conducted for barn owls, and any bat observations were incidental. Nevertheless, the results are valid, and the survey constitutes the third one required for a confirmed roost by the survey guidelines (Collins, 2021). As it was costed as a barn owl survey, the session is not included in the 50 dusk/dawn surveyor sessions targeting bats.

### 3.3. Vantage Point Survey

3.3.1. Building B15 – 22nd June 2021 (dusk)

The north position surveyor observed about 180 common pipistrelles emerging from their roost on the north gable end of B15, the vast majority of which flew around the west side of the building, and headed south. The second surveyor watching from just south of B15 recorded over 200 bats proceeding south, most of which are believed to have come from multiple roosts in B15. It is possible that a small number of additional bats following the same southward trajectory may have originated at different roost sites.

Only a few bats were observed travelling north by either surveyor, including two that emerged from the same roost as the southbound individuals. Accounting for a large overlap in the bats recorded by the two surveyors, approximately 230 bats were seen in total during the survey. Note that this is significantly large than the maximum count from the dusk/dawn surveys.

## 4. Baseline Ecological Conditions

### 4.1. Bat roosts

Surveys have identified the presence of a common pipistrelle maternity roost in B15 (Probation Service offices), which is believed to support around 230 bats (peak count after two dusk and one dawn survey). A VPS identified that nearly all the bats commute south from B15 towards woodland (most likely Stanning's Folly to the south of HMP Garth). Hence, this is considered to be their most important commuting route and foraging habitat. Very few bats commute north.

Therefore, the woodland habitats within the new prison development to the north are not considered to be significant foraging or commuting resources for bats roosting in B15.

Surveys also identified a single occasional soprano pipistrelle day roost at B10. This was only detected on one out of three nocturnal surveys.

No confirmed bat roosts were identified in buildings B1-B6, B8, B9, B13, and tree T3.

Buildings B14 and B16-22 were not surveyed, as they are not affected by the proposed development.

Activity observed during the surveys was dominated by common pipistrelle, with occasional passes by noctule, and rarely a *Myotis* species.

A potential Nathusius' pipistrelle was recorded on one occasion, but the identification could not be confirmed, and could have been common pipistrelle. The habitat on site is not typical of Nathusius' pipistrelle, which is found near waterbodies. However, its presence within the site cannot be ruled out.

### 4.2. Ongoing surveys

Ground-level roost assessment, climbed assessments, and nocturnal surveys of woodland areas and individual trees affected by the new prison development are ongoing. These will be completed in August 2021 and reported separately.

## 5. Impact Assessment

### 5.1. B15 maternity roost

Building B15 will be retained in the site design. However, the new boiler house will be situated around 10m east of B15, and works are anticipated immediately adjacent the building. Construction activities have the potential to disturb the common pipistrelle maternity roost through dust, noise, vibrations, fumes, and artificial lighting. In addition, construction activities could result in accidental damage to building B15, such as machinery strikes and falling materials.

During operation, the new boiler house has the potential to disturb the common pipistrelle maternity roost through increased levels of artificial lighting, and disturbance from operational activities such as increased human presence and vehicle movements.

It is unlikely that loss of foraging habitat or disruption of commuting routes will occur though. The VPS showed that nearly all emerging bats use the tree canopies west of the building, and then commute south, most likely to woodland south of HMP Garth. Therefore, the development is not anticipated to impact commuting routes or foraging habitat for B15 bats.

Future maintenance of B15 has the potential to disturb, damage, obstruct, or destroy the roosts in B15. For example, roof and/or soffits works could block access to roosts. The roosts are most likely located in crevices and narrow voids in the roof apices.

Disturbance of, or damage to, the B15 common pipistrelle maternity roost could trap and harm bats, cause roost abandonment, and precipitate an increase in mortality of dependent young.

### 5.2. B10 day roost

Building B10 is located outside of the development footprint, within the wider site area allocated for BNG enhancements. It is immediately adjacent to proposed woodland planting, around 30m north of the proposed new perimeter fence. Construction activities could cause disturbance through noise.

Operation could bring an increase in artificial lighting, albeit buffered by the perimeter fence. In due course, woodland establishment this will screen the roost from disturbance.

| Building | Roost | Species | Max count | Type | Roosts | Potential impact |
|---|---|---|---|---|---|---|
| B10 | R1 | Common pipistrelle | 1 | Day roost | Soffit. Gable eaves, west elevation | Roost disturbance, possible abandonment |
| B15 | R1 | Common pipistrelle | 128 | Maternity roost | Soffit. Gable eaves, north elevation. | |
| | R2 | Common pipistrelle | 22 | | Soffit. Gable eaves, east elevation | |
| | R3 | Common pipistrelle | 4 | | Gable eaves, west elevation. | Disturbance |

Table 2 – Bat roost identified, and potential impacts of development in t he absence of mitigation.

## 6. Mitigation

### 6.1. B15 maternity roost

Construction activities at the new boiler house must be timed to avoid the May-August bat maternity period, in order to prevent any disturbance to bats during the maternity period. Bats will be emerging and entering the building in large numbers during the maternity period. This is a sensitive period for bats and their young, especially as the young emerge and practice flying.

B15 will be highlighted in the Construction Environmental Management Plan (CEMP), and contractors will be made aware of their duty to ensure that measures are put in place to prevent artificial lighting, noise, dust, fumes, and vibrations causing disturbance or damage to the roost. An exclusion zone will be established around B15, to prevent contractor and vehicle access to the building, parking, storage of materials.

A detailed lighting plan will be produced and reviewed by a licensed Suitably Qualified and Licensed Ecologist (SQLE) prior to the commencement of works. This will conform with accepted guidance (BCT & ILP, 2018). No artificial lighting will be used at the west aspect of the new boiler house, and light spill from other light sources onto B15 will be avoided.

Building maintenance and management will be made aware of the presence of the common pipistrelle maternity roost and their responsibility to engage with an SQLE where works will impact on the roof, soffits, or walls.

### 6.2. B10 day roost

Building B10 will be highlighted in the CEMP, and contractors will be made aware of their duty to ensure that measures are put in place to prevent artificial lighting, noise, dust, and vibrations causing disturbance of the roost.

A detailed lighting plan will be produced and reviewed by an SQLE prior to the commencement of works. It will be designed to be sensitive to bats roosting within B10.

Building maintenance and management will be made aware of the presence of the common pipistrelle day roost, and their responsibility to engage with an SQLE where works will impact this building.

## 7. Residual effects and enhancements

### 7.1. B15 maternity roost

Mitigation measures outlined above, notably the timing of works to avoid the maternity period, and the design of a sensitive lighting plan, will minimise the disturbance to the common pipistrelle maternity roost.

As the roost will be retained and protected during the construction and operational phases, no significant residual effect is anticipated.

The proposals will include BNG grassland enhancements over the wider site within the red line boundary, including large areas of reversion from improved sheep pasture to biodiverse neutral grassland. This will significantly enhance the foraging opportunities for bats using the maternity roost. New artificial roosts (batboxes) will be erected elsewhere on site to support the greater carrying capacity of the site following grassland restoration.

### 7.2. B10 day roost

Mitigation measures outlined above, notably the design of a sensitive lighting plan along the new north perimeter fence, will minimise the disturbance to the common pipistrelle day roost.

As the roost will be retained and protected during the construction and operational phases, no significant residual effect is anticipated.

The BNG proposals over the wider site will revert large areas of improved grassland to biodiverse neutral grassland. This will create significantly foraging habitat for bats.

## 8. References


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## 9. Appendices

**Appendix 1 - Photographs**

**Appendix 2 - Emergence/re-entry survey results**

**Appendix 3 - Vantage Point Survey result**

# Appendix 1 – Photographs

**Photo 1 – South gable of Building B1.**

**Photo 2 – Buildings B3 and B4**

**Photo 3 – Underside of roof of Building B1.**

**Photo 4 – South aspect of Building B5.**

**Photo 5 – North aspect of building B5.**

**Photo 6 – Internal room of Building B5.**

**Photo 7 – North-west aspect of Building B6.**

**Photo 8 – South-west corner of Building B6.**

**Photo 9 – South aspect of Building B8.**

**Photo 10 – South aspect of Building B9.**

**Photo 11 – North aspect of Building B9.**

**Photo 12 – South aspect of Building B10.**


**Photo 13 – North aspect of Building B10.**

**Photo 14 – North-east corner of Building B11.**


**Photo 15 – Building B13.**

**Photo 16 – North gable of Building B15.**

**Photo 17 – North aspect of Building B15.**

**Photo 18 – Soffit at east gable of Building B15.**

# Appendix 2 – Emergence/Re-entry Survey Results

## Survey 1: Building B15 - 10th May 2021 (Dusk)

**Survey site:** CGO001 Building B15, Survey 1 (surveyor locations 15.1 (WS), 15.2 (RE) ,15.3 (ES))
**Date:** 10/05/2021
**Sunset/sunrise:** 20:58
**Start:** 20:40
**End:** 22:30
**Weather conditions:** 100% cloud cover, 3 BWS, light rain at start of survey, start/end temp: 12/10 °C

**Surveyors:** Will Steele (WS), Emma Sutton (ES) and Richard Else (RE)

**Equipment:** BatBox Duet; Pettersson M500 & tablet; Anabat Express; Anabat Scout

**Survey summary:** Three confirmed bat roosts were identified at soffits around the building. Four entry points were identified at roost one (R1), on the western gable. 128 common pipistrelle emerged from R1. Five emerged from roost two (R2) located at the northern gable, assumed to be common pipistrelle. One unidentified bat emerged from roost three (R3) located at the eastern gable, also assumed to be common pipistrelle. Continuous foraging and regular passes recorded by common pipistrelle.

**Survey Constraints**: A brief heavy rain shower occurred during the first portion of the survey, stopping at 21:16, despite this bat activity was recorded during the rainfall and immediately after it ceased.

**Incidental observations**: Barn owl

**Table.1 All Bat Activity Recorded During Survey 1 (B15) 10/05/21 Refer to Figure 1, Photos 1 and 2.**

| Time (24 Hrs) | Surveyor[1] | Species[2] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 20:55 | ES | Ppip | 1 | 1 bat emerged from gap located near to box end of gable (R1). | A |
| 21:11 | ES | Ppip | 1 | 1 bat flying NW to SE | |
| 21:12 | ES | Ppip | 2 | 2 flying SE from NW over gable | |
| 21:13-21:14 | ES | Ppip | 5 | 5 bats emerge, from gaps in the soffit of the gable R1. | B |
| 21:15 | ES | Ppip | 1 | HNS | |
| 21:15 | WS | Unk | 1 | Emerged from eaves on the north aspect (R2) and went west | R2 |
| 21:16-21:18 | ES | Ppip | 25 | Approx. 25 bats emerge at gap in the soffit of the gable R1. | C |
| 21:18 | ES | Ppip | 3 | 3 bats emerge and fly SE (R1) | D |
| 21:19 | ES | Ppip | 2 | 2 bats seen flying back and forth at corner of building. | E |
| 21:20 | ES | Ppip | 5 | 5 bats emerge and fly SE (R1) | C |
| 21:21 | ES | Ppip | 7 | At least 7 bats emerge from R1 | B |
| 21:21 | WS | Unk | 2 | Two bats emerged from R2 and went north. | R2 |
| 21:22 | ES | Ppip | 20 | At least 20 bats emerge from gaps in the soffit of the gable (R1). | C |
| 21:23 | ES | Ppip | 8 | 8 bats emerge from R1 | C |
| 21:23 | RE | Ppip | 1 | Flying from west over building, disappeared behind building. Plus, social calls. | |

[1] Emma Sutton (ES); Will Steele (WS); Ric Else (RE)
[2] HNS - Heard not seen; Unk - unknown species, Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*).

| Time (24 Hrs) | Surveyor[1] | Species[2] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 21:24 | ES | Ppip | 3 | 3 bats emerge from R1 | C, B |
| 21:25 | ES | Ppip | 1 | One bat flying SE to NW over the top of roof. | |
| 21:25 | WS | Ppip | 1 | East to north-west east to north-west | |
| 21:25 | ES | Ppip | 15 | At least 15 bats emerge from R1. | A, D |
| 21:26 – 21:27 | ES | Ppip | 10 | At least 10 emerge from R1. | A, D |
| 21:27 | WS | Ppip | 1 | HNS | |
| 21:27 | RE | Unk | 1 | Flying north to south over building. | |
| 21:27 – 21:29 | ES | Ppip | 20 | At least 20 emerge from R1 | A, D, |
| 21:28 | WS | Ppip | 1 | Emerged from R2 and went north | R2, Figure 1 |
| 21:29 | RE | Unk | 1 | Seen flying close to east gable apex before heading west. | |
| 21:29 | ES | Unk | Several | Several bats seen foraging in trees near building. | |
| 21:29 | ES | Ppip | 2 | 2 bats emerge form R1 | B |
| 21:30 | ES | Ppip | 2 | 2 bats fly N to SE | |
| 21:30 | WS | Unk | 1 | Emerged from R2 and went north | R2 |
| 21:31 | ES | Pip | 1 | 1 bat seen flying SW | |
| 21:31 | RE | Ppip | 1 | Seen flying close to east gable apex before heading west. Plus, social calls. | |
| 21:32 | ES | Ppip | 1 | One bat emerged and flew SE (R1) | A |
| 21:33 | ES | Pip | | HNS, foraging (feeding buzzes) | |
| 21:33 | ES | Ppip | 2 | 2 bats seen foraging around trees near building. | F |
| 21:35 | RE | Unk | 1 | Seen flying close to east gable apex before heading west. | |
| 21:35 | ES | Ppip | 1 | One bat flying SE to NW over roof top. | |
| 21:36 | ES | Ppip | 1 | One bat seen foraging in trees near building. | F |
| 21:36 | RE | Ppip | 1 | HNS, social calls. | |
| 21:38 | ES | Ppip | 3 | 3 bats emerge, flying SE (R1) | C |
| 21:40 | ES | Ppip | 2 | Foraging heard and two bats flying N to S over roof. | |
| 21:41 | RE | Unk | 1 | Flying south over building | |
| 21:42 – 21:44 | WS | Ppip | 1 | HNS, regular foraging passes | |
| 21:42 | ES | Ppip | 1 | Seen flying SE to N | |
| 21:43 | ES | Ppip | 1 | HNS | |
| 21:44 | ES | Ppip | 1 | HNS | |
| 21:45 | ES | Ppip | 1 | Foraging heard and seen around trees near to building | F |
| 21:45 | RE | Unk | 1 | One bat emerged from R3. | G |
| 21:47 | WS | Unk | 1 | HNS, foraging nearby | |
| 21:48 | ES | Ppip | | Foraging, HNS | |
| 21:49 | ES | Ppip | 1 | One bat flying S From N | |
| 21:49 | WS | Unk | 1 | HNS, foraging nearby | |
| 21:52 | ES | Ppip | | HNS | |
| 21:52 | WS | Unk | 1 | HNS, foraging nearby, 2 passes | |
| 21:55 | ES | Ppip | | HNS | |

| Time (24 Hrs) | Surveyor[1] | Species[2] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 21:56 | WS | Unk | 1 | HNS, commuting pass | |
| 21:57-21:59 | ES | Ppip | Several | HNS several bats foraging. | F |
| 21:58 | WS | Unk | 2 | HNS | |
| 21:59 – 22:04 | ES | Ppip | Several | Several bats heard and seen foraging in trees near building. One bat seen flying north over roof top. | F |
| 22:00 | WS | Ppip | 1 | HNS | |
| 22:01 | RE | Unk | 2 | Flying north over building. | |
| 22:01 – 22:09 | WS | Ppip | 1 | HNS, regular passes | |
| 22:04- 22:08 | ES | Ppip | Multiple | Continuous foraging multiple bats. | |
| 22:05 | WS | Unk | 1 | Commuting east to west over building. | |
| 22:07 | RE | Ppip | 1 | HNS | |
| 22:09 | ES | Ppip | 2 | Two bats seen foraging near conifers trees. Continuous foraging continues. | F |
| 22:10 | RE | Ppip | 1 | HNS | |
| 22:10 – 22:31 | ES | Ppip | Multiple | Continuous foraging mostly HNS, multi bats. | |
| 22:10 – 22:13 | WS | Ppip | 2 | HNS. Regular to continuous activity. | |
| 22:13 | RE | Ppip | 1 | HNS | |
| 22:14 – 22:28 | WS | Ppip | 1 | HNS, near continuous distant activity. | |
| 22:15 | RE | Ppip | 1 | HNS, foraging | |
| 22:16 | WS | Nnoc | 1 | HNS | |
| 22:16 | RE | Nnoc | 1 | HNS | |
| 22:16 | RE | Ppip | 1 | Seen flying around R3, flew away over building. | |
| 22:17 | RE | Ppip | 2 | Seen flying around R3, flew away over building | |
| 22:18 | RE | Ppip | 1 | Social calling | |
| 22:23 | RE | Ppip | 1 | HNS | |
| 22:29 | RE | Ppip | 1 | HNS | |

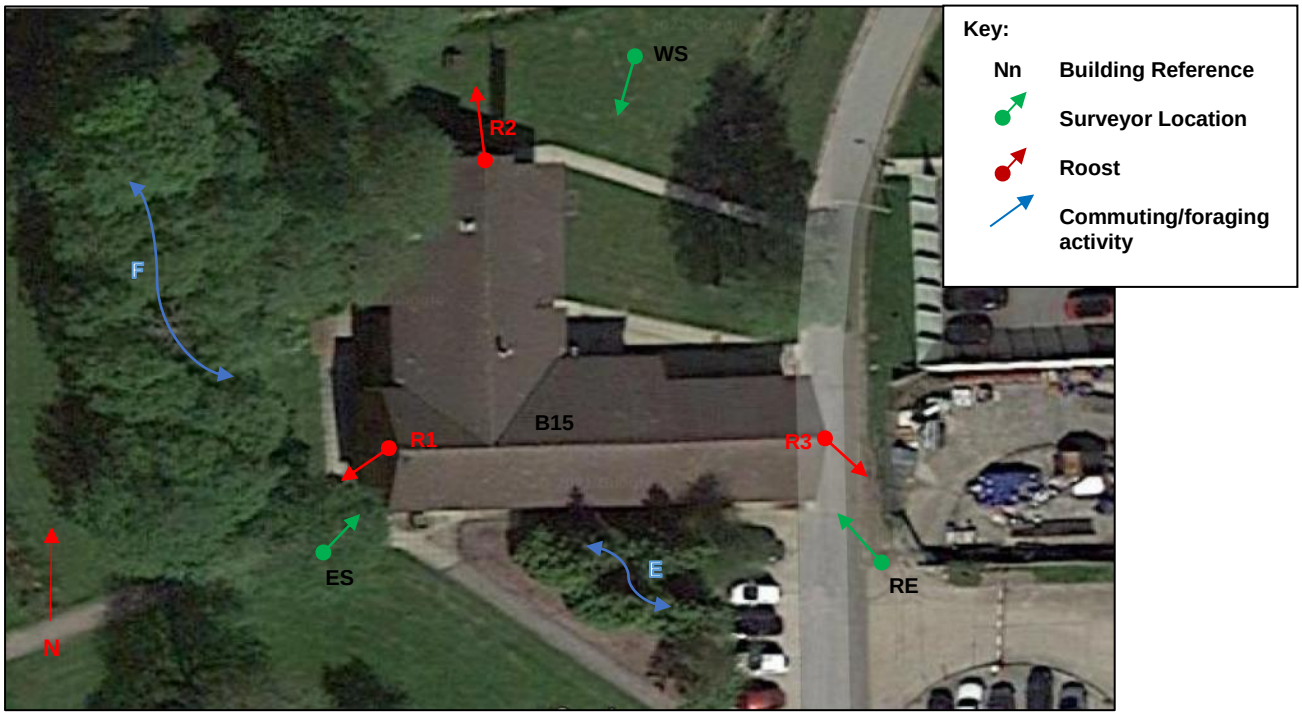



**Figure 1 - Summary of bat activity recorded during the dusk emergence survey of B15 (Survey 1) on 10/05/21.**

**Table 2- Summary of Roosts Identified on 10/05/2021**

| Building Ref. | Roost Ref. | Species | Count | Roost location | Access Point |
|---|---|---|---|---|---|
| B15 | R1 | Common pipistrelle | 128 | Gable eaves, western Elevation | Soffit |
| | R2 | Common pipistrelle | 5 | Gable eaves, north elevation. | Soffit |
| | R3 | Common pipistrelle | 1 | Gable eaves, east elevation | Soffit |

## Roost Photographs:

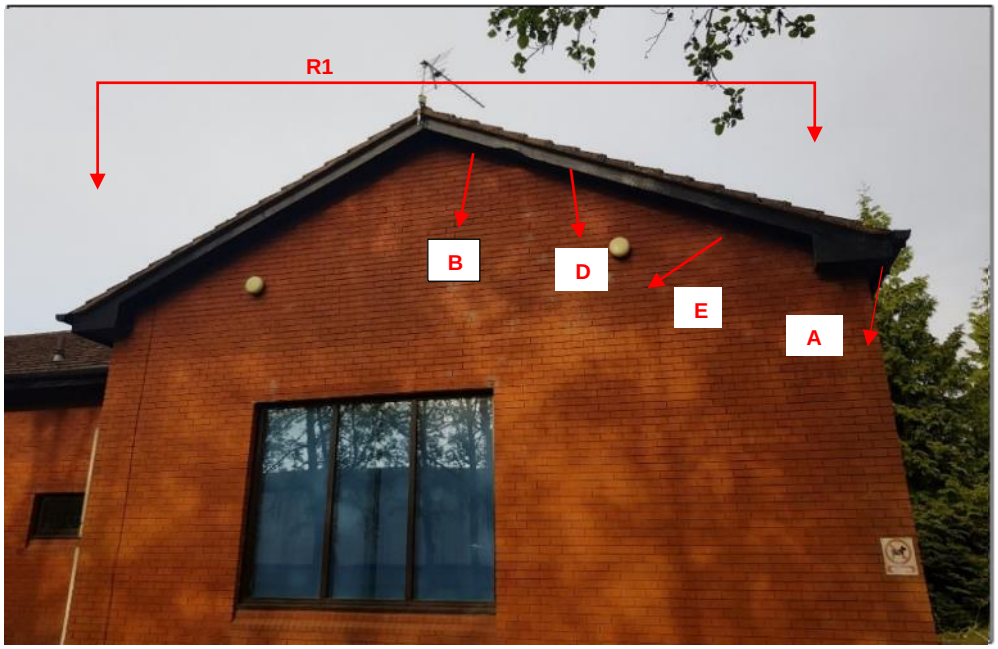



**Photo 1 – B15, Location of Roost 1 (common pipistrelle.), at the eaves of B15 (West elevation).**

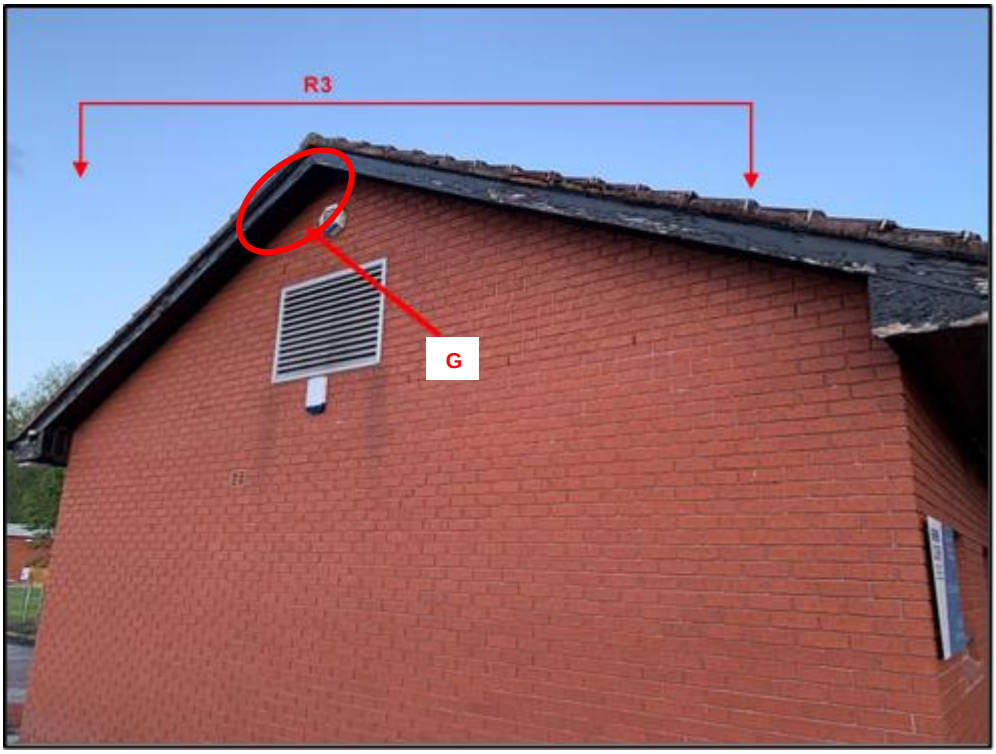



**Photo 2 – Location of emergence of one unknown bat from R3 at eaves of B15 (east elevation).**

## Survey 1: Tree T3 – 11th May 2021 (Dawn)

**Survey site:** CGO001 Tree T3, Survey 1 (T3.1 (WS))
**Date:** 11/05/2021
**Sunset/sunrise:** 05:16
**Start:** 03:45
**End:** 05:20
**Weather conditions:** dry, 0% cloud cover, 1 BWS, start/end temp:7/8 °C
**Surveyors:** Will Steele (WS)
**Equipment:** Pettersson M500 & tablet

**Survey summary:** No confirmed bat roost. Infrequent passes by common pipistrelle and one individual common pipistrelle seen commuting past tree.

**Table 3 - All Bat Activity Recorded During Survey 1 Tree 3 11/05/2021.**

| Time (24 Hrs) | Surveyor[3] | Species[4] | No. bats | Bat Activity |
|---|---|---|---|---|
| 03:53 | WS | Ppip | 1 | HNS |
| 03:57 | WS | Ppip | 1 | HNS |
| 04:07 | WS | Ppip | 1 | HNS |
| 04:09 | WS | Ppip | 1 | HNS |
| 04:11 | WS | Ppip | 1 | HNS |
| 04:19 | WS | Ppip | 1 | HNS |
| 04:20 | WS | Ppip | 1 | Commuting past tree, north west to south east |

## Survey 1: Building B4 – 11th May 2021 (Dawn)

**Survey site:** CGO001 Building B4 Survey 1 (surveyor locations 4.1 – south (RE), 4.2 – north (ES))

**Date:** 11/05/2021
**Sunset/sunrise:** 05:04
**Start:** 03:45
**End:** 05:10
**Weather conditions:** dry, 5% cloud cover, 3 BWS, start temp: 6.5°C
**Surveyors:** Emma Sutton (ES); Ric Else (RE)
**Equipment:** BatBox Duet; Petterson M500 & tablet; Anabat Scout

**Survey summary:** No confirmed bat roosts identified. Limited activity recorded, except infrequent passes by individual common pipistrelle.

**Survey Constraints**: None

**Table 4 - All Bat Activity Recorded During Survey 1 (B4) 11/05/21.**

| Time (24 Hrs) | Surveyor[5] | Species[6] | No. bats | Bat Activity |
|---|---|---|---|---|
| 04:03 | ES | Ppip | 1 | HNS.one pass |
| 04:05 | ES | Ppip | 1 | HNS |
| 04:23 | ES | Ppip | 1 | Flying south east over roof |
| 04:35 | ES | Ppip | 1 | HNS |

[3] Will Steele (WS);
[4] HNS - Heard not seen; Ppip - common pipistrelle (*Pipistrellus pipistrellus*)
[5]Emma Sutton (ES); Richard Else (RE).
[6] Ppip - common pipistrelle (*Pipistrellus pipistrellus*);

## Survey 1: Building B10 – 18th May 2021 (Dusk)

**Survey site:** CGO001 Building B10 Survey 1 (surveyor locations 10.1 (ES), 10.2 (HW), 10.3 (RE), 10.4 (RW))
**Date:** 18/05/2021
**Sunset/sunrise:** 21:11
**Start:** 20:40
**End:** 23:10
**Weather conditions:** dry, 0% cloud cover, 1 BWS, start/end temp: 11°C/10.5°C
**Surveyors:** Rachel Whitaker (RW); Richard Else (RE); Emma Sutton (ES); Hazel Watson (HW)
**Equipment:** Pettersson M500 & tablet; BatBox Duet x2; Anabat Scout; Echo Meter EM3

**Survey summary:** At least one Common Pipistrelle emerged from roost (R1) in building, exiting from the west gable end near the apex of the roof. At least eight Noctules were recorded commuting SE to NW high over the building between 2127 and 2145, and at least one Common Pipistrelle was foraging around the building from 2148 onwards. One pass by an myotis species was also recorded.

**Incidental observations:** One Barn Owl emerged from the south side of the building and quartered the adjacent fields.

**Survey constraints:** None

**Table 5 - All Bat Activity Recorded During Survey 1 (B10) 18/05/2021. Refer to Fig. 2.**

| Time (24 Hrs) | Surveyor[7] | Species[8] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 21:27 | RW | Nnoc | 1 | HNS, briefly | |
| 21:31 – 21:33 | all | Nnoc | 4+ | Commuting SE to NW overhead. | A |
| 21:42 | all | Nnoc | 1 | Commuting SE to NW overhead. | A |
| 21:43 | all | Nnoc | 1 | HNS | |
| 21:45 | RW, RE | Nnoc | 1 | Commuting SE to NW overhead | A |
| 21:49 | RE | Ppip | 1 | HNS | |
| 21:49 | RW | Ppip | 1 | Emerged from building. Exited from behind wooden board at apex on west gable end. | R1 |
| 21:48 – 21:57 | all | Ppip | 1 | Likely same individual as above flying around close to building | |
| 22:00 | all | Ppip | 1 | Foraging around building | |
| 22:05 – 23:06 | all | Ppip | 1+ | Recorded foraging around building frequently from 2205 until end of survey. | |
| 22:30 | RW | Nnoc | 1 | HNS, briefly | |
| 22:30 | RE | Nnoc | 1 | HNS | |
| 22:34 | RW | Ppip | 1 | Foraging south of building over grassland | |
| 23:10 | RE | Myo | 1 | HNS, one pass | |

**Table 6 - Summary of Roosts Identified 18/05/2020**

| Building Ref. | Roost Ref. | Species | Count | Roost location | Access point(s) |
|---|---|---|---|---|---|
| **B10** | **R1** | Common Pipistrelle | 1 | Gable Eaves, west elevation. | Eaves |

[7] Rachel Whitaker (RW); Emma Sutton (ES); Hazel Watson (HW); Richard Else (RE)
[8] HNS - Heard not seen; Nnoc - noctule (Nyctalus noctula); Ppip - common pipistrelle (Pipistrellus pipistrellus): Myo – Myotis sp.

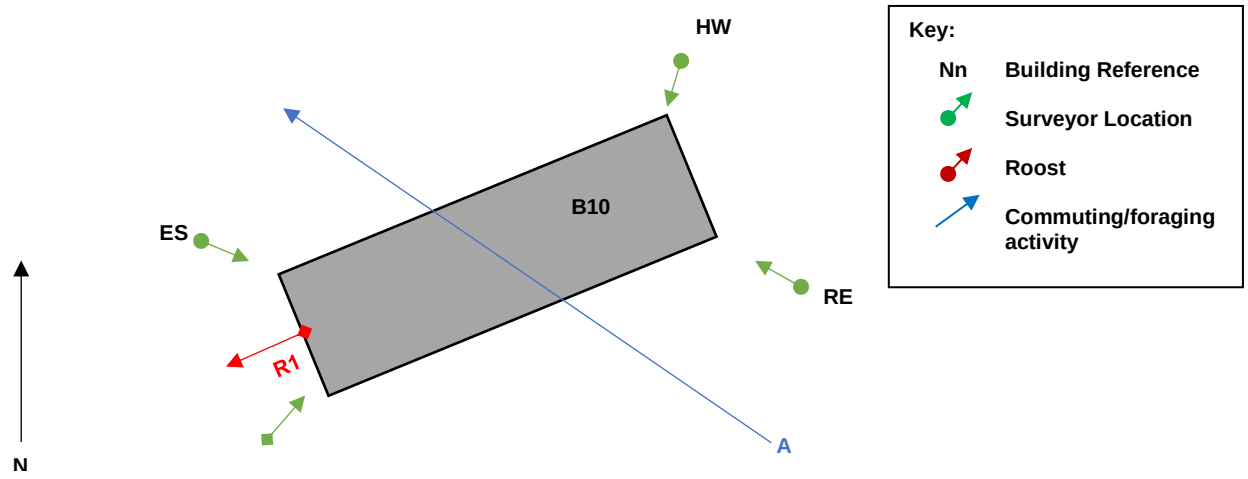



**Figure 2-** Summary RW bat activity recorded during the dusk emergence survey of Building 10 (Survey 1) on 18/05/2021.

## Roost Photographs:


**Photo 3 – Location of Roost R3 (Common Pipistrelle) in B10 (west elevation).**

## Survey 1: Building B9 – 19th May 2021 (Dawn)

**Survey site:** CGO001 Building B9, Survey 1 (surveyor locations 9.1 (RW),9.2 (ES), 9.3 (HW), 9.4 (RE))
**Date:** 19/05/2021
**Sunset/sunrise:** 05:03
**Start:** 03:20
**End:** 05:05
**Weather conditions:** dry, 5% cloud cover, 1 BWS, temp: 5°C
**Surveyors:** Rachel Whitaker (RW); Hazel Watson (HW) Emma Sutton (ES); Ric Else (RE).
**Equipment:** BatBox Duet; Pettersson M500 & tablet; Anabat Scout; Echo Meter EM3.

**Survey summary:** No confirmed bat roosts identified. No bat activity recorded, except one brief pass, by an individual pipistrelle sp.

**Survey constraints:** None

**Table 7- All Bat Activity Recorded During Survey 1 (B9) 19/05/2021**

| Time (24 Hrs) | Surveyor[9] | Species[10] | No. bats | Bat Activity |
|---|---|---|---|---|
| 03:48 | ES | Pip | | HNS, faint |
| 03:48 | RW | Pip | | HNS, brief and quiet |


**Figure 3 –** Surveyor Locations during dawn emergence survey of Building 9 (Survey 1) on 19/05/2021.

[9] Rachel Whitaker (RW); Emma Sutton (ES); Ric Else (RE); Hazel Watson (HW)
[10] Pip - *Pipistrellus* sp.

## Survey 1: Building B1 – 19th May 2021 (dusk)

**Survey site:** CGO001 Building B1, Survey 1 (surveyor locations 1.1 (south-east; RE,1.2 (north-west; ES)

**Date:** 19/05/2021
**Sunset/sunrise:** 21:13
**Start:** 20:40
**End:** 22:50
**Weather conditions:** dry, 5% cloud cover, 2 BWS, temp: 10°C
**Surveyors:** Emma Sutton (ES); Ric Else (RE)
**Equipment:** BatBox Duet; Petterson M500 & tablet; Anabat Scout

**Survey summary:** No bat roosts identified. Frequent passes from individual commuting common pipistrelle, from east to west over the building. Infrequent foraging also recorded by common pipistrelle around the building.

**Survey Constraints**: M500 malfunction and recordings lost.

**Table 8- All Bat Activity Recorded During Survey 1 (B1) 19/05/2021.**

| Time (24 Hrs) | Surveyor [11] | Species[12] | No. bats | Bat Activity |
|---|---|---|---|---|
| 21:34 | ES | Ppip | 1 | HNS |
| 21:34 | RE | Ppip | 1 | Flying east to west. |
| 21:35 | ES | Ppip | 2 | Commuting east to west high over rooftop. |
| 21:35 | RE | Ppip | 1 | HNS |
| 21:36 | ES | Ppip | 1 | Commuting east to west, over rooftop. |
| 21:37 | ES | Ppip | 1 | HNS |
| 21:37 | RE | Ppip | 1 | Flying east to west |
| 21:37 | RE | Ppip | 2 | Flying east to west over building |
| 21:38 | ES | Ppip | 1 | Commuting from east to west |
| 21:38 | RE | Ppip | 1 | HNS |
| 21:39 | ES | Ppip | 1 | Commuting from east to west |
| 21:39 | RE | Ppip | 2 | HNS |
| 21:40 | RE | Ppip | 1 | Flying east to west north of building. |
| 21:41 | ES | Ppip | 1 | Commuting from east to west |
| 21:41 | ES | Ppip | 1 | Commuting from east to west, in front of north aspect. |
| 21:42 | RE | Ppip | 1 | Commuting east to west over building. |
| 21:45 | ES | Ppip | 1 | Commuting east to west, over rooftop |
| 21:45 | RE | Unk | 1 | Flying east to west, just north of building, not heard. |
| 21:47 | ES | Pip | 1 | HNS, briefly |
| 21:47 | RE | Ppip | 1 | HNS |
| 21:50 | ES | Ppip | 1 | Commuting north east to south west, over rooftop. |
| 21:50 | RE | Ppip | 1 | Flying east to west over building |
| 21:57 | ES | Ppip | 1 | Flying from north to south, low to ground. |

[11]Emma Sutton (ES); Ric Else (RE)
[12] HNS - Heard not seen; Unk - unknown species; Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Ppyg)

| Time (24 Hrs) | Surveyor [11] | Species[12] | No. bats | Bat Activity |
|---|---|---|---|---|
| 21:59 | ES | Ppip | 1 | Commuting east to west in front of north aspect. |
| 22:00 | ES | Pip | 1 | HNS, faint |
| 22:00 | RE | Ppip | 1 | Flying from east, seen foraging around building. |
| 22:01 | ES | Ppip | 1 | HNS, 3 bat passes |
| 22:01 | RE | Ppip | 1 | HNS |
| 22:03 | ES | Ppip | 1 | Commuting low to ground from east to west in front of north aspect. |
| 22:05 | RE | Ppip | 1 | Flying from east to west over building |
| 22:10 | RE | Ppip | 1 | Flying from east to west over building |
| 22:11 | ES | Pip | 1 | HNS, faint |
| 22:13 | ES | Pip | 1 | HNS |
| 22:13 | RE | Ppip | 1 | Flying from east to west over building |
| 22:14 | ES | Ppip | 1 | Commuting north to south, low to ground. |
| 22:18 | RE | Ppip | 1 | Flying west to east over building |
| 22:26 | ES | Unk | 1 | HNS, faint |
| 22:26 | RE | Ppip | | HNS, brief |
| 22:31 | ES | Unk | 1 | HNS, brief and distant |
| 22:31 | RE | Ppip | | HNS, faint |
| 22:34 | ES | Pip | 1 | HNS, Faint |
| 22:34 | RE | Pip | | HNS, faint |
| 22:35 | ES | Ppip | 1 | HNS, one pass |
| 22:38 | RE | Pip | | HNS, faint |
| 22:51 | ES | Ppip | 1 | Foraging, feeding buzzes heard. |

## Survey 1: Building B2 – 19th May (dusk)

**Survey site:** CGO001 Building B2, Survey 1 (surveyor locations 2.1 (south-east; RW), 2.2 (north-west; HW)
**Date:** 19/05/2021
**Sunset/sunrise:** 21:13
**Start:** 20:40
**End:** 22:50
**Weather conditions:** dry, 5% cloud cover, 2 BWS, temp: 10°C
**Surveyors:** Rachel Whitaker (RW); Hazel Watson (HW)
**Equipment:** BatBox Duet; Petterson M500 & tablet; Echo Meter EM3.

**Survey summary:** No confirmed bat roosts identified. Frequent passes by commuting common pipistrelle, flying from east to west over building. Occasional foraging observed around the building by common pipistrelle.

**Incidental observations:** Notable species observed include barn owl and tawny owl.

**Survey Constraints**: None.

**Table 9 - All Bat Activity Recorded During Survey 1 (B2) 19/05/2021.**

| Time (24 Hrs) | Surveyor [13] | Species[14] | No. bats | Bat Activity |
|---|---|---|---|---|
| 21:34 | RW | Ppip | 1 | Flying east to west, high above building. |
| 21:34 | HW | Ppip | 1 | HNS |
| 21:35 | RW | Ppip | 1 | Commuting east to west, flying south of the building. |
| 21:36 | RW | Ppip | 1 | Flying east to west, north of stables. High above stables. |
| 21:36 | HW | Ppip | 1 | Seen flying from east, across buildings. |
| 21:37 | RW | Ppip | 1 | Flying east to west, north of stables. High above stables. |
| 21:38 | RW | Ppip | 2 | Commuting east to west, south of building 2 and high above. |
| 21:38 | RW | Ppip | 1 | Commuting east to west, below building 2 rooflines. |
| 21:39 | RW | Ppip | 2 | Commuting east to west, below building 2 rooflines |
| 21:40 | RW | Ppip | 1 | Commuting east to west, north of building 2 |
| 21:40 | HW | Ppip | | Seen flying from east. |
| 21:41 | RW | Ppip | 1 | Commuting east to west, north of building 2 |
| 21:45 | HW | Ppip | 1 | Bat seen flying around corner of building. |
| 21:50 | HW | Ppip | 1 | Seen flying from east, across buildings |
| 21:50 | RW | Ppip | 1 | Commuting east to west. |
| 21:57 | HW | Ppip | 1 | HNS |
| 21:59 | RW | Ppip | 1 | Foraging to the side of building 3 |
| 21:59 | HW | Ppip | 1 | Flying between buildings and flew west. |
| 22:00 – 22:01 | HW | Ppip | 1 | Bat seen flying low over roof and between buildings, continuously. |

[13] Rachel Whitaker (RW); Hazel Watson (HW)
[14] HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (Nyctalus noctula); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*)

| Time (24 Hrs) | Surveyor [13] | Species[14] | No. bats | Bat Activity |
|---|---|---|---|---|
| 22:00 | RW | Ppip | 1 | Commuting east to west across the yard. |
| 22:00 | RW | Ppip | 1 | Flying north to south in front of building 2, before flying up and down buildings. |
| 22:01 | RW | Ppip | 2 | Seen foraging between building 1 and 2 and second bat flew east to west, south of building 1. |
| 22:02 | HW | Ppip | 1 | HNS |
| 22:03 | HW | Ppip | 1 | Seen flying between buildings and over roof, not heard. |
| 22:03 | HW | Ppip | 1 | HNS |
| 22:03 | RW | Ppip | 1 | Flying east to west, north of building 2. |
| 22:03 | RW | Ppip | 1 | HNS. brief |
| 22:05 | RW | Ppip | 1 | HNS,5 passes |
| 22:05 | HW | Ppip | 1 | HNS |
| 22:10 | RW | Ppip | 1 | Flying south east to north west around building 2 and between building 1. |
| 22:13 | HW | Ppip | | HNS |
| 22:13 | RW | Ppip | 1 | flying south east to north west around building 2 and between building 1. |
| 22:13 | RW | Ppip Nnoc | 2 | HNS |
| 22:18 | RW | Ppip | 1 | HNS, foraging |
| 22:26 | RW | Ppip | 1 | HNS |
| 22:31 | RW | Ppip | 1 | HNS |
| 22:31 | HW | Ppip | 1 | HNS, faint |
| 22:34 | RW | Ppip | 1 | HNS |
| 22:35 | RW | Ppip | 1 | HNS, faint |
| 22:35 | HW | Ppip | 1 | HNS, brief |
| 22:38 | RW | Pip | 1 | HNS |
| 22:51 | HW | Ppip | 1 | HNS, brief |

## Survey 1: Building B8 – 20th May 2021 (Dawn)

**Survey site:** CGO001 Building B8 Survey 1 (surveyor locations 8.1 (south; RE) and 8.2 (north;ES))

**Date:** 20/05/2021
**Sunset/sunrise:** 05:02
**Start:** 03:30
**End:** 05:10
**Weather conditions:** dry, 5% cloud cover, 1 BWS, temp: 7°C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES)
**Equipment:** BatBox Duet; Petterson M500 & tablet

**Survey summary:** No confirmed bat roosts identified. Occasional passes, mostly heard not seen by individual common pipistrelle. Occasional commuting recorded by common pipistrelle from east to west and west to east, over the building.

**Survey constraints:** RW position, south west aspect slightly blocked by fence line, roofline visible. M500 malfunction and recordings lost for ES location, however all observed activity confirmed as common pipistrelle.

**Table 10 - All Bat Activity Recorded During Survey 1 (B8) 20/05/2021**

| Time (24 Hrs) | Surveyor [15] | Species[16] | No. bats | Bat Activity |
|---|---|---|---|---|
| 03:46 | ES | Ppip | 1 | HNS, distant |
| 03:49 | RW | Ppip | 1 | HNS |
| 03:50 | ES | Pip | 1 | HNS, faint |
| 03:51 | ES | Ppip | 1 | HNS, one passes |
| 03:54 | ES | Ppip | | HNS, briefly |
| 03:54 | RW | Pip | | HNS, faint |
| 03:59 | RW | Ppip | 1 | HNS, two passes |
| 04:01 | RW | Ppip | 1 | Seen flying south east to north west close to building at roof height. |
| 04:02 | ES | Ppip | | HNS |
| 04:07 | RW | Ppip | 1 | HNS, briefly |
| 04:07 | ES | Ppip | 1 | HNS, one pass |
| 04:11 | RW | Pip | | HNS, faint |
| 04:11 | ES | Ppip | | HNS |
| 04:15 | RW | Ppip | 1 | Commuting south east to south west, below roof height. |
| 04:15 | ES | Ppip | 1 | HNS |
| 04:16 | RW | Ppip | 1 | HNS |
| 04:26 | RW | Ppip | 2 | Appeared by north west aspect corner flying south east, followed by a second bat. |
| 04:26 | ES | Ppip | 1 | HNS, one pass |
| 04:31 | RW | Ppip | 1 | HNS |
| 04:32 | ES | Ppip | 1 | Commuting east to west, high above roof top. |
| 04:39 | ES | Ppip | 1 | Commuting west to east, over rooftop. |
| 04:39 | RW | Pip | 1 | Flying from south west to east, over rooftop. |

[15] Rachel Whitaker (RW); Emma Sutton (ES)
[16] HNS - Heard not seen; Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*)

## Survey 1: Building B13 – 20th May 2021 (Dawn)

**Survey site:** CGO001 Building B13, Survey 1 (surveyor locations 13.1 (south; HW), 13.2 (north; RE))

**Date:** 20/05/2021
**Sunset/sunrise:** 05:02
**Start:** 03:25
**End:** 05:15
**Weather conditions:** dry, 5% cloud cover, 1 BWS, temp: 7°C
**Surveyors:** Ric Else (RE); Hazel Watson (HW)
**Equipment:** BatBox Duet; Anabat Scout; Echo Meter EM3.

**Survey summary:** No confirmed bat roosts identified. Infrequent calls, mostly heard and not seen, by individual common pipistrelle. Common pipistrelle seen flying over building, heading north.

**Table 11 - All Bat Activity Recorded During Survey 1 (B13) 20/05/2021**

| Time (24 Hrs) | Surveyor [17] | Species[18] | No. bats | Bat Activity |
|---|---|---|---|---|
| 03:49 | HW | Ppip | 1 | HNS |
| 03:54 | HW | Ppip | 1 | HNS |
| 03:54 | RE | Ppip | 1 | HNS, one pass |
| 03:55 | HW | Unk | 1 | HNS |
| 03:58 | HW | Ppip | 1 | HNS |
| 04:01 | HW | Ppip | 1 | HNS |
| 04:01 | RE | Unk | 1 | HNS, brief |
| 04:06 | HW | Ppip | 1 | HNS |
| 04:10 | HW | Ppip | 1 | HNS |
| 04:19 | HW | Ppip | 2 | HNS |
| 04:19 | RE | Ppip | 1 | Flying north, east of building |
| 04:22 | RE | Ppip | 1 | Flying north, east of building |
| 04:23 | HW | Ppip | 1 | HNS |
| 04:23 | RE | Pip | 1 | Flying south over building |
| 04:27 | HW | Pip | 1 | HNS, faint |
| 04:31 | RE | Unk | 1 | Flying north, east of building, not heard. |

## Survey 2: Tree T3 – 25th May 2021 (Dusk)

[17] Ric Else (RE); Hazel Watson (HW)
[18] HNS - Heard not seen; Unk - unknown species; Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*)

**Survey site:** CGO001 Tree T3 Survey 2 (surveyor location T3.1)
**Date:** 25/05/2021
**Sunset/sunrise:** 21:22
**Start:** 20:52
**End:** 22:50
**Weather conditions:** 80% CC, Dry,1BWS, temp: 10°C
**Surveyors:** Ric Else (RE)
**Equipment:** Anabat Scout

**Survey summary:** No confirmed bat roost. Limited activity was recorded. An individual common pipistrelle was recorded flying east to west passed the tree and one common pipistrelle was recorded foraging. *Three potential Nathusius' pipistrelle calls were recorded (Peak frequency 40-42kHz), however these were only a few pulses per recording and the species identification is not considered to be conclusive

**Survey constraints:** Approximately 15 minutes of light rain during survey. Unable to verify Nathusius pipistrelle calls, due to short duration length of calls recorded.

**Table 12 - All Bat Activity Recorded During Survey 2 (T3) 25/05/2021**

| Time (24 Hrs) | Surveyor [19] | Species[20] | No. bats | Bat Activity |
|---|---|---|---|---|
| 21:40 | RE | Pnat* | 1 | Seen flying east to west passed tree |
| 21:43 | RE | Pnat* | 1 | Seen flying east to west passed tree |
| 21:48 | RE | Pnat* | 1 | Seen flying east to west passed tree |
| 21:52 | RE | Pip | 1 | HNS, seen flying east to west passed tree |
| 22:00 | RE | Ppip | 1 | Seen flying east to west passed tree |
| 22:28 | RE | Ppip | 1 | HNS |
| 22:37 | RE | Ppip | 1 | HNS, Foraging |

[19] Richard Else (RE)
[20] HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (Nyctalus noctula); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Pnat – Nathusius' pipistrelle (*Pipistrellus nathusii*)

## Survey 1: Building B6 – 25th May 2021 (Dusk)

**Survey site:** CGO001 Building B6 Survey 1 (surveyor locations 8.1 north-west)
**Date:** 25/05/21
**Sunset/sunrise:** 21:22
**Start:** 21:03
**End:** 22:50
**Weather conditions:** dry, 80% cloud cover, 1 BWS, temp: 10°C
**Surveyors:** Will Steele (WS)
**Equipment:** Petterson M500 & tablet

**Survey summary:** No confirmed bat roosts identified. Occasional passes by commuting and foraging common pipistrelle. Common pipistrelle seen commuting over the car park from north west to east.

**Incidental observations:** A bluetit nest was observed between bricks to the right of the main air vent.

**Survey constraints:** Approximately 15 minutes of light rain during survey.

**Table 13- All Bat Activity Recorded During Survey 1 (B6) 25/05/2021**

| Time (24 Hrs) | Surveyor [21] | Species[22] | No. bats | Bat Activity |
|---|---|---|---|---|
| 21:40 | WS | Ppip | 1 | HNS, very distant |
| 21:43 | WS | Ppip | 1 | HNS, very distant |
| 21:47 | WS | Ppip | 1 | Commuting over car park from north west to east. |
| 21:48 | WS | Ppip | 1 | HNS, distant |
| 21:49 – 21:55 | WS | Ppip | 1 | HNS, infrequent passes |
| 22:08 | WS | Ppip | 1 | Foraging |
| 22:09 – 22:10 | WS | Ppip | 1 | Foraging nearby, five passes. |
| 22:12 - 22:28 | WS | -- | - | Light rain |
| 22:25 – 22:34 | WS | Ppip | 1 | HNS, distant and occasional |
| 22:31 | WS | Nyc | 1 | HNS, social calls |
| 22:38 | WS | Ppip | 1 | HNS, distant |
| 22:47 | WS | Ppip | 1 | HNS, two passes |
| 22:52 | WS | Ppip | 1 | HNS, two passes |

[21] Will Steele (WS)
[22] HNS - Heard not seen; Unk - unknown species; Nyc – *Nyctalus* sp.; Nnoc - noctule (*Nyctalus noctula*); Ppip - common pipistrelle (*Pipistrellus pipistrellus*);

## Survey 1: Building 3 – 25th May 2021 (Dusk)

**Survey site:** CGO001 Building B3 Survey 1 (surveyor locations 3.1 (north-west; ES), 3.2 (south-east; RW))
**Date:** 25/05/2021
**Sunset/sunrise:** 21:22
**Start:** 21:02
**End:** 22:50
**Weather conditions:** dry, 90% cloud cover, 2 BWS, temp: 10°C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES)
**Equipment:** BatBox Duet; Pettersson M500 & tablet

**Survey summary:** No confirmed bat roosts identified. Frequent passes from commuting common pipistrelle, heading towards nearby woodland to the west**.**

**Survey constraints:** Light rain before the start of the survey. Stop/start light rain showers between 22:09 and the end of the survey.

**Table 14 - All Bat Activity Recorded During Survey 1 (B3) 25/05/2021.**

| Time (24 Hrs) | Surveyor [23] | Species[24] | No. bats | Bat Activity |
|---|---|---|---|---|
| 21:35 | RW | Ppip | 1 | Flying from east to west, towards woodland |
| 21:35 | ES | Ppip | 1 | Commuting east to west |
| 21:45 | ES | Ppip | 2 | Commuting, east to west at roof top height. |
| 21:46 | RW | Ppip | 2 | Flying from direction of building 4, passing close by the north east corner of building 3. |
| 21:46 | RW | Noc | 1 | HNS |
| 21:47 | ES | Ppip | 1 | Commuting, east to west at roof top height. |
| 21:47 | RW | Ppip | | Flying over building 3 at rooftop height, heading west towards woodland. |
| 21:48 | RW | Ppip | 2 | Flying west, along the north and south aspect of building 3. |
| 21:48 | ES | Ppip | 2 | Commuting, east to west at roof top height. |
| 21:49 | RW | Ppip | 1 | Flying west, around the north east corner of building 3. |
| 21:49 | ES | Ppip | 1 | Commuting from north to west, low to ground. |
| 21:50 | ES | Ppip | 2 | Commuting south east to west, rooftop height. |
| 21:50 | RW | Ppyg | 1 | Flying south to north west, in font of building 3. |
| 21:50 | RW | Ppip | 1 | Commuting west around the north east corner of building 3. |
| 21:59 | ES | Ppip | 1 | Commuting east to west at rooftop height. |
| 21:59 | RW | Ppyg | 1 | Flying east to west over yard. |
| 22:09 | RW | - | - | Stop/start light rain showers begin. |
| 22:11 | RW | Ppip | 1 | Flying east to west, towards woodland. |

[23] Rachel Whitaker (RW); Emma Sutton (ES)
[24] HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Ppyg - soprano pipistrelle (*Pipistrellus pygmaeus*)

| Time (24 Hrs) | Surveyor [23] | Species[24] | No. bats | Bat Activity |
|---|---|---|---|---|
| 22:11 | ES | Ppip | 1 | Three passes, flying north to south over rooftop. |
| 22:11 | RW | Ppip | 1 | Two passes around front of building 3 and west gable and back. |
| 22:13 | RW | Unk | 1 | Seen and not heard, flying between building 3 and 4. |
| 22:13 | ES | Ppip | 1 | HNS, one pass |
| 22:28 | RW | Ppip | | HNS |
| 22:28 | ES | Ppip | 1 | Foraging (feeding buzz), flying east to west. |
| 22:33 | ES | Unk | | HNS, brief |
| 22:33 | RW | Nnoc | 1 | HNS |
| 22:35 | RW | Ppip | 1 | HNS, briefly and faint |
| 22:35 | ES | Ppip | 1 | HNS, commuting |
| 22:39 | ES | Pip | 1 | HNS, two passes |

## Survey 2: Building B15 - 26th May 2021 (Dawn)

**Survey site:** CGO001 Building B15, Survey 2 (surveyor locations 15.1 (north; RE), 15.2 (east; ES), 15.3 (south-west;RW))

**Date:** 26/05/2021

**Sunset/sunrise:** 04:54

**Start:** 02:54

**End:** 05:25

**Weather conditions:** dry, 100% cloud cover, 1 BWS, temp: 8°C

**Surveyors:** Rachel Whittaker (RW); Emma Sutton (ES); Ric Else (RE)

**Equipment:** BatBox Duet; Pettersson M500 & tablet; Anabat Scout;

**Survey summary:** Three bat roosts were identified at soffits. Roost one (R1) was identified at the west gable, 11 common pipistrelles entered. Roost two (R2) was identified at the north aspect of the building, 15 common pipistrelles entered. Roost three (R3) was identified at the east gable, one common pipistrelle entered. Regular passes from commuting and foraging common pipistrelle was recorded. Swarming activity at both R1 and R2 by common was also recorded.

**Table 15 - All Bat Activity Recorded During Survey 2 (B15) 26/05/2021. Refer to Fig. 4, Photos 4, 5 and 6**

| Time (24 Hrs) | Surveyor [25] | Species[26] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 03:00 | RW | Unk | 1 | Seen not heard during setting up of equipment. | |
| 03:00 | RE | Unk | 1 | HNS | |
| 03:03 | ES | Ppip | 2 | HNS | |
| 03:04 | ES | Ppip | 1 | HNS, faint | |
| 03:05 | ES | Ppip | 1 | HNS | |
| 03:06 | RW | Ppip | 1 | Seen foraging around trees close to building. | A |
| 03:06 – 03:07 | RE | Ppip | 1 | HNS | |
| 03:06 | ES | Ppip | 1 | HNS, 1 bat pass | |
| 03:07 | RW | Ppip | 1 | Seen foraging around trees close to building. | A |
| 03:08 | RW | Ppip | 1 | HNS | |

[25] Rachel Whitaker (RW); Emma Sutton (ES); Ric Else (RE)

[26] HNS - Heard not seen; Unk - unknown species; Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Ppyg - soprano pipistrelle (*Pipistrellus pygmaeus*);

| Time (24 Hrs) | Surveyor [25] | Species[26] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 03:08 | ES | Ppip | | HNS 3 bat passes | |
| 03:08 | RE | Ppip | 1 | HNS | |
| 03:09 | RW | Ppip | 2 | Seen flying west away from building | |
| 03:09 | ES | Ppip | 1 | HNS, faint and distant | |
| 03:09 – 03:14 | RW | Ppip | | Continuous bat passes, possible circling at gable. | B |
| 03:11 | ES | Ppip | 1 | Flying from north west towards western gable box end, turned and flew back north west. | |
| 03:13 | RE | Ppip | 1 | HNS | |
| 03:13 | ES | Pip | 1 | HNS, faint | |
| 03:15 – 03:21 | RW | Ppip | 6 | Swarming at gable, continuous. | B |
| 03:16 - 03:17 | RE | Ppip | 1 | HNS, activity for one minute. | |
| 03:18 | ES | Pip | 1 | HNS, distant and faint | |
| 03:21 | ES | Ppip | 1 | HNS, 1 bat pass | |
| 03:21 – 03:22 | RW | Ppip | 2 | Swarming at gable, continuous | B |
| 03:22 | RE | Ppip | 1 | HNS, activity for one minute, foraging | |
| 03:23 | RE | Ppip | 1 | Activity for one minute. | |
| 03:23 | RW | Ppip | 2 | Swarming at gable, continuous | B |
| 03:24 | RW | Ppip | 2 | Swarming at gable, continuous | B |
| 03:25 | RW | Ppip | 3 | Swarming at gable, continuous | B |
| 03:25 | ES | Ppip | 1 | HNS, I bat pass. | |
| 03:25 | RE | Ppip | 2 | HNS | |
| 03:26 | ES | Ppip | | Seen flying from east to west, commuting, roof top height. | |
| 03:27 | RE | Ppip | 2 | HNS | |
| 03:28 – 03:40 | RW | Ppip | 5 | Swarming activity at gable, continuous and at least five enter roost (R1). | C |
| 03:29 | ES | Ppip | 1 | Flying from west, flew back and forth towards gable, then flew north west over rooftop. | |
| 03:29 - 03:31 | RE | | | HNS, activity for 2 minutes. | |
| 03:30 | ES | Ppip | 1 | Flying from north west over rooftop, flew around west gable end. | |
| 03:32 - 03:39 | RE | Ppip | 1 | Seen foraging over building, continuous | |
| 03:33 | ES | Ppip | 1 | HNS, 2 passes | |
| 03:34 – 03:36 | ES | Ppip | 1 | Seen flying back and forth towards the eastern gable eave intermittently, not seen entering. | |
| 03:37 – 03:38 | ES | Ppip | 2 | HNS, intermittently | |
| 03:39 | ES | Ppip | 1 | Seen flying back and forth towards the eastern gable eave, not seen entering. | |
| 03:40 – 03:42 | RE | Ppip | 1 | HNS, continuous foraging | |
| 03:41 | RW | Ppip | 2 | Flying around the west elevation | |
| 03:42 | RW | Ppip | 1 | Flying towards gable then flew south. | |
| 03:41 – 03:42 | ES | Ppip | | HNS, Foraging intermittently | |
| 03:44 | RW | Ppip | 2 | Seen flying east along south aspect | |
| 03:44 | RE | Ppip | 1 | HNS, brief | |
| 03:45 | RE | Ppip | 1 | HNS, brief | |
| 03:45 | RW | Ppip | 1 | Flew north over building looped back south of building, then flew north. | |
| 03:48 | RW | Ppip | 2 | Seen flying from west to east, along building | |

| Time (24 Hrs) | Surveyor [25] | Species[26] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 03:48 | RW | Ppip | 3 | Seen flying from west to east, along building | |
| 03:48 | RE | Ppip | 1 | HNS | |
| 03:49 | ES | Ppip | 1 | HNS | |
| 03:49 - 03-51 | RE | Ppip | 2 | Seen flying around building, continuous activity for 2 minutes. | |
| 03:49 | ES | Ppip | 1 | HNS, intermittently | |
| 03:50 | RW | Ppip | 3 | Seen flying north from south along building. | |
| 03:50 | RW | Ppip | 4 | Seen flying from west to east, along building. | |
| 03:51 | RW | Ppip | 3 | Seen flying from west to east, along building. | |
| 03:53 | ES | Ppip | 1 | Seen flying east to west, commuting | |
| 03:53 | RW | Ppip | 5 | Seen flying from west to east, along building. | |
| 03:53 – 04:02 | RE | Ppip | 2 | Seen flying around building | |
| 03:55 | ES | Ppip | 1 | HNS, commuting | |
| 03:58 | ES | Ppip | 1 | HNS | |
| 04:00 | ES | Ppip | 1 | One seen entering north gable (R3). | D |
| 04:01 | RW | Ppip | 7 | Seen flying from west to east, along building | |
| 04:03 - 04:09 | RE | Ppip | ~6 | At least 6 bats seen repeatedly flying up to R2 entry point and chasing around for 6 minutes. | E |
| 04:03 | ES | Ppip | 1 | HNS, faint and distant | |
| 04:04 | ES | Ppip | 1 | Flying north to east over rooftop | |
| 04:06 – 04:09 | ES | Pip | | HNS, faint, intermittent | |
| 04:10 | RE | Ppip | ~3 | At least 3 bats seen repeatedly approaching entry point for R2 and flying away again (hard to see). | E |
| 04:13 | RE | Ppip | 2 | Seen repeatedly approaching R2 entry point | E |
| 04:15 | RW | Ppip | 10 | Seen flying from west to east, along building. | |
| 04:16 | ES | Ppip | 1 | HNS, one pass | |
| 04:17 | RE | Ppip | 4 | At least 4 bats seen repeatedly flying up to R2. | E |
| 04:18 | RE | Ppip | 4 | At least 4 bats seen entering R2. | F |
| 04:18 | RW | Ppip | 2 | Seen flying north, along east facing building. | |
| 04:19 | ES | Ppip | 1 | HNS, one pass | |
| 04:19 – 04:21 | RE | Ppip | 5 | At least 5 bats seen flying up to R2 before entering. With social calls | E, F |
| 04:20 | RW | Ppip | 10 | Seen flying north, along east facing building. | |
| 04:21 | RE | Ppip | 2 | Seen entering behind soffit, on the north elevation (R2). | F |
| 04:22 | ES | Ppip | 1 | HNS, distant | |
| 04:23 | RE | Ppip | 1 | Seen entering behind soffit, on the north elevation (R2). | F |
| 04:24 | RE | Ppip | 1 | Seen entering behind soffit, on the north elevation (R2). | F |
| 04:25 | RE | Ppip | 1 | Seen flying out of R2 and back in again. | |
| 04:25 | RW | Ppip | 2 | Seen flying from west to east, along building. | |
| 04:26 | RW | Ppip | 1 | Seen entering behind the soffit on the west elevation (R1). | G |
| 04:26 | RE | Ppip | 1 | Seen entering behind soffit on the north elevation (R2). | F |
| 04:27 | RW | Ppip | 2 | Entered R1 | R1 |

| Time (24 Hrs) | Surveyor [25] | Species[26] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 04:28 | RW | Ppip | 1 | Seen entering at the eaves, on west elevation (R1). | R1 |
| 04:32 | RW | Ppip | 1 | Seen entering behind soffit at the apex (R1). | H |
| 04:34 | RW | Ppip | 1 | Seen flying around building, before entering roost 1 | R1, |

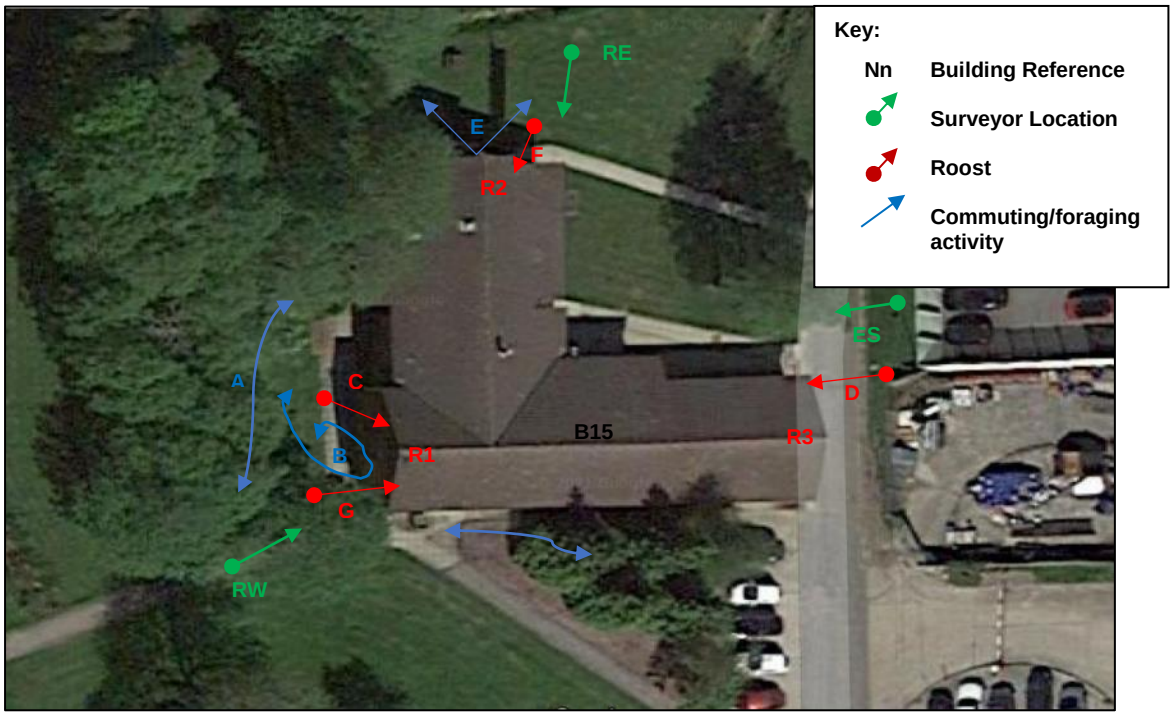



**Figure 4 - Summary of bat activity recorded during the dawn emergence survey of B15 (Survey 2) on 26/05/21.**

**Table 16 - Summary of Roosts Identified B15 (Survey 2) - 26/05/2021**

| Building Ref. | Roost Ref. | Species | Count | Roost location | Access Point |
|---|---|---|---|---|---|
| B15 | R1 | Common Pipistrelle | 6 | Gable Eaves, West Elevation | soffit |
| | R2 | Common Pipistrelle | 15 | Eaves North Elevation | Soffit |
| | R3 | Common Pipistrelle | 1 | Gable Eaves, East Elevation | Gable box end |

## Roost Photographs:

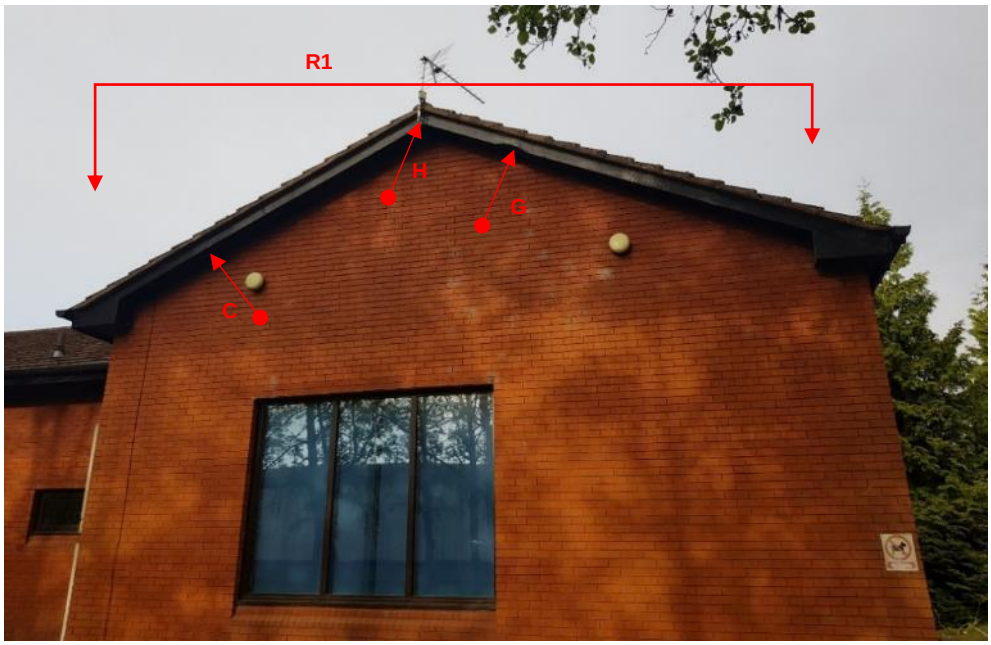



**Photo 4 – B15, Location of Roost 1 (Pipistrelle sp.), at the eaves of B15 (West elevation).**

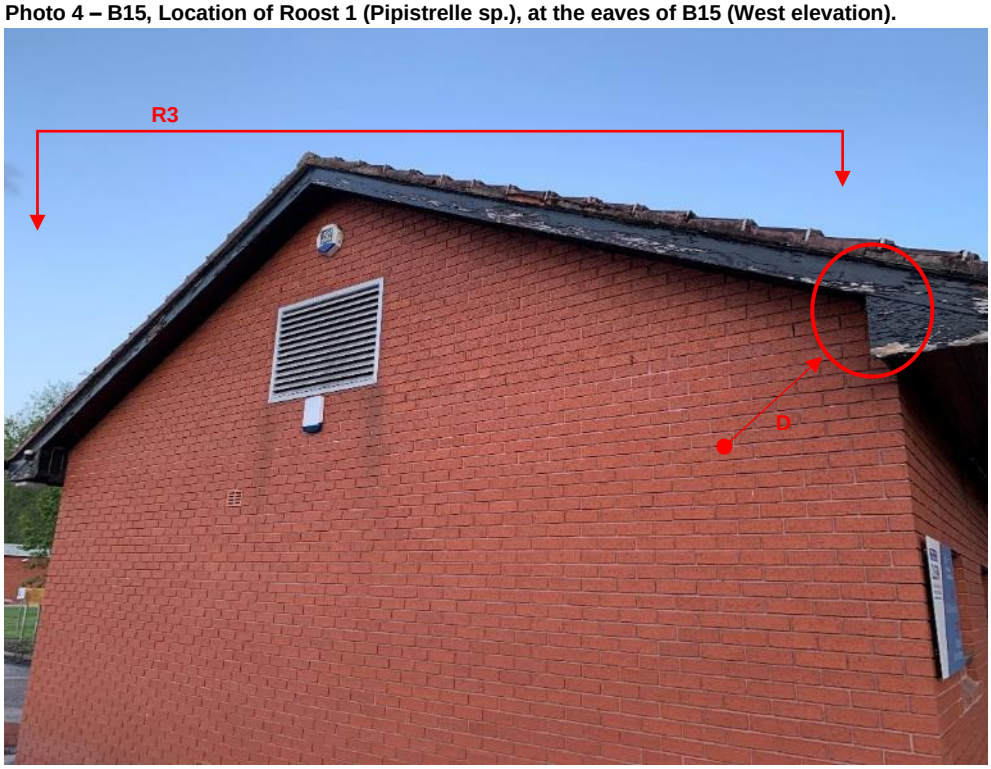



**Photo 5 – B15, Location of Roost 3 (Pipistrelle sp.), at the eaves of B15 (East elevation).**


**Photo 6 – B15, Location of Roost 2 (Pipistrelle sp.), at the eaves of B15 (North elevation).**

## Survey 1: Building 6 – 7th June 2021 (dusk)

**Survey site:** CGO001 B6 Survey 1 (surveyor locations 6.2 (north-east; RE), 6.3 (south-east; HW), 6.4 (south-west; ES), 6.5 (west; RW))
**Date:** 07/06/2021
**Sunset/sunrise:** 21:37
**Start:** 21:07
**End:** 23:37
**Weather conditions:** dry, 30% cloud cover, 1 BWS, 16°C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES); Richard Else (RE); Hazel Watson (HW).
**Equipment**; BatBox Duet; Pettersson M500 & tablet; Anabat Scout; Echo Meter EM3

**Survey summary:** Up to three common pipistrelles were observed continuously foraging around B5, and hedgerow in the north. Occasional passes by noctule were also heard.

**Incidental observations:** N/a

**Survey constraints:** Part of the south aspect view, was restricted by a portakabin.

**Table 17 - All Bat Activity Recorded During Survey 1 (B6) 07/06/2021.**

| Time (24 Hrs) | Surveyor [27] | Species[28] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 22:03 | HW | Unk | 1 | HNS, briefly | |
| 22:05 | ES | Ppip | 1 | HNS, two passes. | |
| 22:05 | RW | Ppip | 1 | HNS, briefly and quietly. | |
| 22:06 | RE | Ppip | 1 | Flew from SW across the car park. | |
| 22:07 | RE | Ppip | 2 | Foraging around the car park. | |
| 22:07 | RW | Ppip | 1 | HNS | |
| 22:08 | ES | Ppip | 1 | HNS, two passes. | |
| 22:08 | HW | Pip | 1 | HNS, faintly | |
| 22:08 | RW | Ppip | 1 | Flew East to west around the north-west (NW) corner of B6, below roof height. | |
| 22:09 – 22:10 | ES | Ppip | 1 | HNS, three passes. | |
| 22:11 | RE | Ppip | 1 | Foraging around car park. | |
| 22:11 | ES | Ppip | 1 | HNS, one pass. | |
| 22:11 | HW | Ppip | 1 | HNS, faintly | |
| 22:13 | HW | Unk | 1 | Bat flew from the south towards the building, below roof height. | |
| 22:15 | RE | Ppip | 1 | HNS | |
| 22:16 | ES | Ppip | 1 | HNS, brief, two passes. | |
| 22:16 | HW | Pip | 1 | Bat seen flying around the building | |
| 22:17 | RE | Ppip | 1 | Flew east to west over the B6. | |
| 22:17 | RW | Ppip | 2 | Flying back and forth under the overhang on the south aspect. | |
| 22:17 | RE | Pip | 1 | HNS. | |
| 22:17 – 22:27 | HW | Pip | 1 | Bat flying around B6. | |
| 22:18 | RE | Ppip | 1 | HNS, foraging. | |
| 22:19 | RW | Ppip | 1 | HNS | |
| 22:20 | RE | Ppip | 1 | HNS, foraging. | |
| 22:20 | RW | Ppip | 1 | Flew around the NW corner of B6 to the south toward position 2. | |
| 22:21 | ES | Pip | 1 | Flying low, south from the tree line, to the west | |
| 22:21 | ES/RW | Nnoc | 1 | HNS, one pass | |
| 22:21 | RE | Nnoc | 1 | Flying low overhead NW | |

[27] Rachel Whitaker (RW); Richard Else (RE); Emma Sutton (ES); Hazel Watson (HW)
[28] HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Ppyg - soprano pipistrelle (*Pipistrellus pygmaeus*)

| Time (24 Hrs) | Surveyor [27] | Species[28] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 22:22 | RW | Ppip | 1 | Flying around NW corner of B6 under the overhang. | |
| 22:22 | ES | Pip | 1 | Flying low, south from the tree line to the west. | |
| 22:22 – 22:31 | RE | Ppip | 1 | Foraging around the car park | |
| 22:23 | ES | Ppip | 1 | Foraging west to south, low towards tree line. | |
| 22:24 | RW | Ppip | 1 | Flying north to south under the overhang, close to B6. | |
| 22:26 | RW | Ppip | 1 | HNS briefly. | |
| 22:27 – 22:29 | ES | Ppip | 1 | HNS, foraging intermittently. | |
| 22:30 – 22:34 | HW | Ppip | 1 | Bat seen flying around B5. | |
| 22:31 | RW | Ppip | 3 | Two commuting north to south, 1 HNS foraging. With social calls | |
| 22:32 | RW | Ppip | 1 | HNS intermittently. | |
| 22:32 | ES | Ppip | 1 | Flying from the west to south towards tree line. | |
| 22:34 | ES/RE | Ppip | 1 | HNS, 1 pass | |
| 22:35 | RW | Ppip | 1 | HNS, intermittently. | |
| 22:36 | HW | Unk | 1 | Bat seen flying around B5. | |
| 22:37 | ES | Ppyg | 1 | HNS, foraging | |
| 22:37 – 22:43 | RW | Ppip | 1 | HNS, foraging continuously. | |
| 22:40 | HW | Pip | 1 | Bat seen flying around B5. | |
| 22:41 | ES | Pip | 1 | Flying from south along the tree line towards the building, | |
| 22:41 | ES | Pip | 1 | Flying west to east over the top of B6. | |
| 22:41 | RE/RW | Nnoc | 1 | HNS | |
| 22:42 – 22:44 | RE | Ppip | 1 | HNS | |
| 22:43 | ES | Ppyg | 1 | HNS foraging | |
| 22:45 | RW | Ppip | 1 | Commuting north to south over the bowling green, with social calls. | |
| 22:45 | ES | Ppip | 1 | HNS, one pass. | |
| 22:45 | HW | Ppip | 1 | Bat seen flying around B5. | |
| 22:45 | RE | Ppip | 1 | Foraging around car park | |
| 22:47 | RW | Ppip | 1 | Foraging along the hedge, north of B5, before flying east. | |
| 22:47 – 22:50 | RE | Ppip | 1 | Foraging around car park | |
| 22:48 | ES | Ppip | 1 | Flying west to south, towards treeline. | |
| 22:49 | HW | Ppip | 1 | Flying overhead. | |
| 22:50 | ES/RW | Ppip | 1 | HNS, Foraging | |
| 22:51 | ES | Ppip | 1 | HNS, commuting. | |
| 22:53 | RE | Ppip | 1 | Flew from the SW direction. | |
| 22:53 | RW | Ppip | 1 | HNS | |
| 22:55 | ES | Ppip | 1 | Flying at west aspect, then flew south, heard foraging. | |
| 22:55 | HW | Unk | 1 | Flying overhead. | |
| 23:00 | HW | Pip | 1 | HNS. | |
| 23:00 | RE | Ppip | 1 | HNS | |
| 23:01 | RW | Ppip | 1 | HNS, briefly. | |
| 23:03 | RE | Ppip | 1 | HNS | |
| 23:05 | RW | Ppip | 1 | HSN | |
| 23:08 | RE | Ppip | 1 | HNS | |
| 23:10 | RE/ RW | Ppip | 1 | HNS | |
| 23:11 | ES/HW/RW | Pip | 1 | HNS, with social calls. | |
| 23:12 | HW | Unk | 1 | HNS | |
| 23:12 | RE | Ppip | 1 | HNS | |
| 23:13 | ES/RW | Pip | 1 | HNS 1 pass | |

| Time (24 Hrs) | Surveyor [27] | Species[28] | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 23:16 – 23:19 | HW | Ppip | 1 | HNS, briefly. | |
| 23:17 | RE/ RW | Ppip | 1 | HNS | |
| 23:18 | ES/RW | Pip | 1 | HNS, one pass, with social calls. | |
| 23:21 | RW | Pip | 1 | HNS, briefly | |
| 23:24 | ES | Unk | 1 | HNS | |
| 23:25 | All | Pip | 1 | HNS, 1 Pass | |
| 23:26 | RW | Unk | 1 | HNS. | |
| 23:27 | RW | Ppip | 1 | HNS, briefly. | |
| 23:28 | HW | Unk | 1 | HNS, faintly | |
| 23:30 | RE | pip | 1 | HNS | |
| 23:30 | RW | Ppyg | 1 | HNS | |
| 23:31 | HW | Ppip | 1 | HNS. | |
| 22:31 | RW | Ppip | 1 | HNS with social calls. | |
| 23:32 | ES | Pip | 1 | HNS, commuting. | |
| 23:32 | RW | Unk | 1 | HNS, passed close by | |
| 23:33 | RE/RW | Ppyg | 1 | HNS | |
| 23:35 | RE | Ppip | 1 | HNS | |

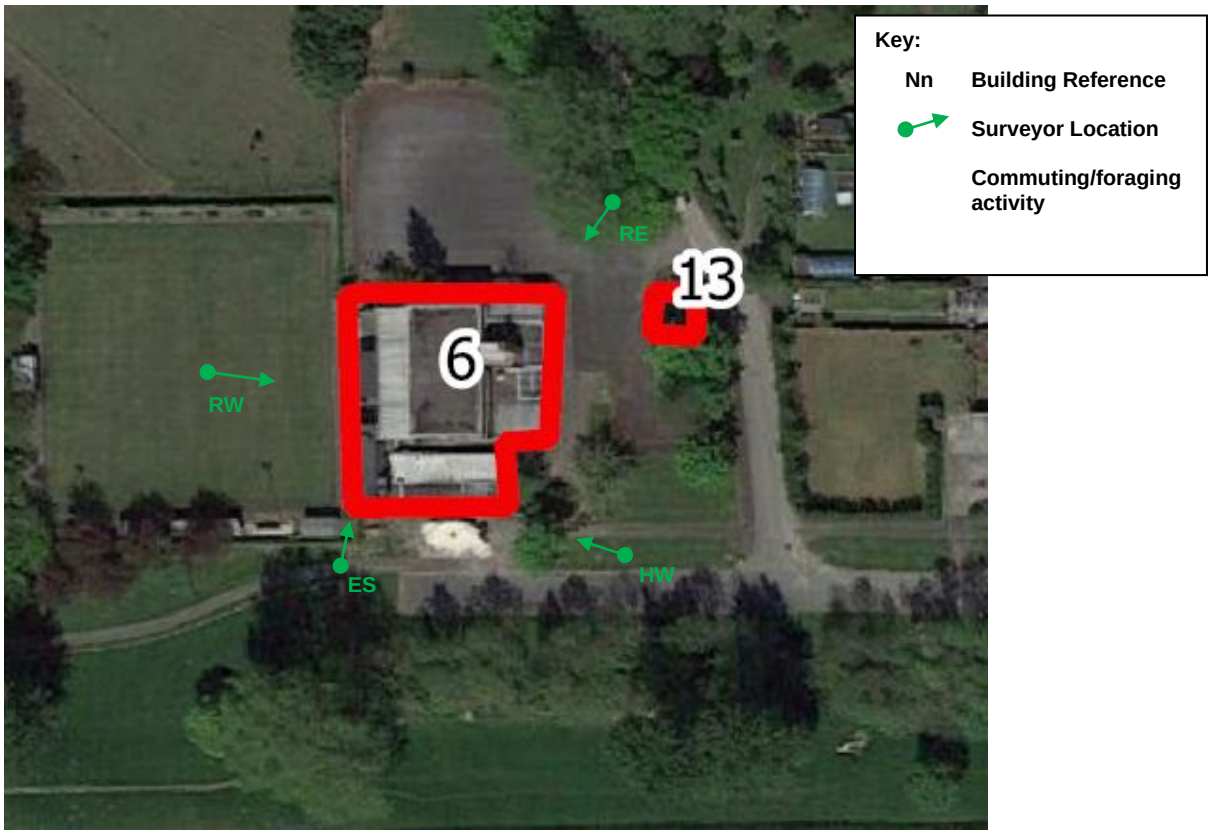



**Figure 5 - Summary of bat activity recorded during the dawn emergence survey of B6 (Survey 1) on 07/06/21.**

## Survey 2: Building 10 – 8th June 2021 (Dawn)

**Survey site:** CGO001 B10 Survey 2 (surveyor locations 10.1 (north-west; ES), 10.2 (south-west; RW), 10.3 (south-east; RE) 10.4 (north-east; HW))
**Date:** 08/06/2021
**Sunset/sunrise:** 04:42
**Start:** 02:42
**End:** 04:42
**Weather conditions:** dry, 10% cloud cover, 1 BWS, 11 °C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES); Richard Else (RE); Hazel Watson (HW).
**Equipment:** BatBox Duet; Pettersson M500 & tablet; Anabat Scout; Echo Meter EM3

**Survey summary:** No roosting activity observed, the occasional pass by common pipistrelle and noctules was recorded.

**Incidental observations:** A barn owl was seen entering B10, through a gap in the roof on the south aspect. Two further barn owls were seen carrying rodents, south and north of B10, possibly to a building in the south-east.

**Survey constraints:** N/a

**Table 18 - All Bat Activity Recorded During Survey 1 (B10) 05/06/2021**

| Time (24 Hrs) | Surveyor[1] | Species [2] | No. bats | Bat Activity |
|---|---|---|---|---|
| 03:03 | HW/ RE | Ppip | 1 | HNS, briefly |
| 03:05 | ES/ HW/ RW | Ppip | 1 | HNS, one pass. |
| 03:13 | ES/HW/RW | Ppip | 1 | HNS, commuting |
| 03:20 | ES | Ppip | 1 | Flying east to west along B10 |
| 03:20 | HW/RW | Ppip | 1 | HNS |
| 03:22 | ES | Pip | 1 | HNS, briefly. |
| 03:32 | RW | Ppip | 1 | Commuting west to east close to B10, lost site once reached the building. |
| 03:32 | RE | Ppip | 1 | HNS |
| 03:42 | ES/ RW | Ppip | 1 | HNS, 1 brief pass. |
| 03:59 | RW | Nnyc | 1 | HNS |
| 04:05 | ES | Ppip | 1 | HNS, briefly. |
| 04:05 | RW | Nnyc | 1 | Commuting high above B10, west to east. |
| 04:06 | RW | Nnyc | 1 | HNS |
| 04:08 | RW/HW | Nnyc | 1 | HNS |

## Survey 1: Building 5 – 8th of June (Dusk)

**Survey site:** CGO001 B5 Survey 1 (surveyor locations 5.3 (south-west; ES), 5.4 (south; RW) and 5.5 (north; HW))
**Date:** 08/06/2021
**Sunset/sunrise:** 21:38
**Start:** 21:08
**End:** 23:38
**Weather conditions:** dry, 20% cloud cover, 2 BWS, Temp:17 °C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES); Hazel Watson (HW).
**Equipment:** BatBox Duet; Pettersson M500 & tablet; Echo Meter EM3

**Survey summary:** No roosts were confirmed at the building. Constant foraging activity in the yard between the two doors was observed during most of the survey by common pipistrelle, with occasional noctule and unidentified bats.

**Incidental observations:** A barn owl was sat on the field fence to the east of B5. A tawny owl was also heard calling.

**Survey constraints:** The view between the two stable buildings was restricted by two large metal doors in the north and south. A security light was present on the southern aspect which also restrict part of the view.

**Table 19 - All Bat Activity Recorded During Survey 1 (B5) 08/06/2021.**

| Time (24 Hrs) | Surveyor | Species | No. bats | Bat Activity | Map Annotation & Photos |
|---|---|---|---|---|---|
| 22:19 | HW | Ppip | 1 | HNS | |
| 22:31 | ES | Ppip | 1 | Flying west to east close to the north elevation. | |
| 22:38 | RW | Pip | 1 | HNS | |
| 22:39 | ES | Ppip | 1 | Flying from NE to south over the top of B5. | |
| 22:40 | HW | Ppip | 1 | HNS | |
| 22:40 | ES | Ppip | 1 | Flying east to west. | |
| 22:41 | RW | Ppip | 1 | Flew over the metal door and looped back. | |
| 22:41 | ES | Ppip | 2 | One seen foraging and one commuting north. | |
| 22:41 | ES | Ppip | 1 | Flying south to east, from rooftop. | |
| 22:43 | ES | Ppip | 1 | Commuting east to west, | |
| 22:43 | HW | Unk | 1 | HNS | |
| 22:43 | RW | Ppip | 2 | Flying west to east below the roofline, and foraging back and forth between the two buildings | |
| 22:44 | ES | Ppip | 1 | HNS, foraging. | |
| 22:45 – 22:46 | RW | Ppip | 1 | Commuting north to south between the two buildings, then east Infront of B5 | |
| 22:46 | HW | Unk | 1 | HNS | |
| 22:46 | ES | Ppip | 1 | Commuting east to west. | |
| 22:48 | ES | Ppip | 1 | Flying from the west, heading south along the wall. | |
| 22:48 | HW | Unk | 1 | HNS | |
| 22:50 | All | Ppip | 1 | HNS, 1 pass. | |
| 22:51 – 22:57 | RW | Ppip | 1 | Foraging between the two building, going back and forth in the yard. | |
| 22:52 | HW | Unk | 1 | Bat seen flying over the top of B5. | |
| 22:53 | ES | Ppip | 1 | Seen at gate in the north, looped back and flew south. | |
| 22:54 | ES | Ppip | 1 | Flying from north to south over the gate. | |
| 22:56 | HW | Unk | 1 | HNS | |

| | | | | | |
|---|---|---|---|---|---|
| 22:56 – 22:59 | ES | Ppip | 1 | Foraging in front of the north elevation, seen flying round intermittently. | |
| 22:56 | RW | Ppip | 1 | Flew over the door to the west, turning north-east over B5. | |
| 22:58 – 23:02 | RW | Ppip | 1 | Foraging back and forth between the two building continuously. | |
| 23:00 | ES | Ppip | 1 | Flying north to south, along east elevation of B5. | |
| 23:00 | ES | Ppip | 1 | Flying north to south, close to the gate. | |
| 23:00 – 23:02 | HW | Unk | 1 | HNS | |
| 23:01 | ES | Ppip | 1 | Flying west to east. | |
| 23:01 | ES | Ppip | 1 | Foraging around the north elevation. | |
| 23:02 | RW | Ppip | 1 | Flew over the door and then west. | |
| 23:02 | ES | Nnyc | 1 | HNS | |
| 23:03 | RW | Nnyc | 1 | Commuting high above B5, west to east. | |
| 23:03 | ES | Ppip | 1 | HNS. | |
| 23:05 | ES | Pip | 1 | HNS, foraging. | |
| 23:05 – 23:30 | RW | Ppip | 1 | Foraging continuously between the two buildings. | |
| 23:06 | ES | Ppip | 1 | HNS, 1 pass | |
| 23:10 | RW | Nnyc | 1 | HNS | |
| 23:10 | HW | Unk | 1 | HNS | |
| 23:12 | HW | Unk | 1 | HNS | |
| 23:12 | RW | Ppip | 2 | Flying west to east and looping back close to B5, and circling at the SW corner. | |
| 23:14 | ES | Unk | 1 | HNS | |
| 23:16 | ES | Ppip | 1 | HNS, foraging. | |
| 23:23 – 23:25 | HW | Unk | 1 | HNS | |
| 23:23 | RW | Ppip | 1 | Passed east to west in front of B5 | |
| 23:23 | ES | Unk | 1 | HNS, very faintly. | |
| 23:25 | RW | Ppip | 1 | Passed east to west in front of B5 | |
| 23:25 | ES | Ppip | 1 | HNS, two passes. | |
| 23:27 | ES | Ppip | 1 | HNS, one pass. | |
| 23:28 | RW | Ppip | 1 | Flew south to north over the west side of B5. | |
| 23:29 – 23:31 | HW | Unk | 1 | HNS, multiple passes | |
| 23:29 | ES | Ppip | 1 | HNS, commuting. | |
| 23:30 | ES | Ppip | 1 | HNS, one pass | |
| 23:32 | ES/RW | Pip | 1 | HNS | |
| 23:33 | HW | Unk | 1 | HNA | |
| 23:33 | RW | Ppip | 1 | HNS | |
| 23:34 | ES | Ppip | 1 | HNS | |
| 23:35 | RW | Ppip | 1 | HNS, probably still foraging between the two buildings. | |

## Survey 2: Building 5 – 9th of June 2021 (Dawn)

**Survey site:** CGO001 B5 Survey 1 (surveyor locations 5.1 (north-west; ES), 5.4 (south-east; RW) and 5.5 (south-west; HW))
**Date:** 09/06/2021
**Sunset/sunrise:** 04:42
**Start:** 03:12
**End:** 04:42
**Weather conditions:** dry, 30% cloud cover, 1 BWS, Start temp:14°C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES); Hazel Watson (HW).
**Equipment:** BatBox Duet; M500 & tablet; and Echo Meter EM3

**Survey summary:** No roosts were confirmed at the building. Constant foraging activity in the yard between the two doors was observed during most of the survey by common pipistrelle, with occasional noctule and unidentified bats.

**Incidental observations:** A barn owl was sat on the field fence to the east of B5.

**Survey constraints:** The view between the two stable building were restricted by two large metal doors in the north and south. A security light was present on the southern aspect which also restrict part of the view.

**Table 20 - All Bat Activity Recorded During Survey 1 (B5) 09/06/2021.**

| Time (24 Hrs) | Surveyor [29] | Species[30] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 03:07 | HW | Ppip | 1 | HNS | |
| 03:08 | All | Ppip | 1 | HNS | |
| 03:09 | ES | Ppip | 1 | HNS, 1 pass. | |
| 03:13 | RW/ ES | Ppip | 1 | HNS, briefly | |
| 03:17 | HW / ES | Ppip | 1 | HNS | |
| 03:18 | RW | Ppip | 1 | HNS | |
| 03:21 | RW/HW | Ppip | 1 | HNS | |
| 03:22 | RW | Unk | 1 | SNH, flying over B5 roof into the field in the east. Not pick up by M500. | |
| 03:22 | HW/ ES | Ppip | 1 | Flying west to east over B5 | |
| 03:23 | ES | Ppip | 1 | HNS, briefly. | |
| 03:24 | ES | Ppip | 1 | Seen flying in front of B5 north aspect, west to east. | |
| 03:24 | HW | Ppip | 1 | Flying west to east over B5 and back again. | |
| 03:24 | RW | Ppip | 1 | HNS | |
| 03:26 | RW | Ppip | 1 | HNS | |
| 03:27 | RW | Ppip | 1 | HNS | |
| 03:29 | RW/ HW | Ppip | 1 | HNS, briefly | |
| 03:30 | HW | Ppip | 1 | SNH, Flying west to east over B5. | |
| 03:30 | RW | Ppip | 1 | Foraging between the two buildings. | |
| 03:32 | RW | Ppip | 1 | HNS | |
| 03:36 | RW | Pip | 1 | HNS, briefly | |
| 03:45 | HW | Nnoc | 1 | HNS | |
| 03:46 | RW | Ppip | 1 | Commuting, west to east over the field. | |
| 03:46 | HW | Nnoc | 1 | HNS | |
| 03:47 | RW | Nnoc | 1 | HNS | |
| 03:50 | RW | Ppip | 1 | Flying north to south over the grassland, before turning east to west, flying close to B5 below roof height. Could not see the bat past the second window in the east, may have re-entered building. | |

[29] Rachel Whitaker (RW); Emma Sutton (ES); Hazel Watson (HW).
[30] HNS - Heard not seen; SNH – Seen not heard; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Ppyg - soprano pipistrelle (*Pipistrellus pygmaeus*)

| Time (24 Hrs) | Surveyor [29] | Species[30] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 03:50 | HW | Unk | 1 | Flying between the two buildings from the east. Not picked up by EM3. | |
| 03:51 | HW | Ppip | 1 | Bat seen flying east to west in front of B5, before looping back east. | |
| 03:53 | RW | Ppip | 1 | Commuting west to east before turn to fly north to south. | |
| 03:56 | ES | Ppip | 1 | Commuting west to east, towards the trees | |

## Survey 3: Building B15 – 09th June 2021 (Dusk)

**Survey site:** CGO001 B15 Survey 3 (surveyor locations 15.1 (HW), 15.2 (ES), 15.3 (RW))
**Date:** 09/06/2021
**Sunset/sunrise:** 21:39
**Start:** 21:09
**End:** 23:39
**Weather conditions:** dry, 100% cloud cover, 2 BWS, Temp:19 °C
**Surveyors:** Rachel Whitaker (RW); Emma Sutton (ES); Hazel Watson (HW).
**Equipment:** BatBox Duet; Pettersson M500 & tablet; Echo Meter EM3

**Survey summary:** Seven roosts were confirmed at the building at soffits. Constant foraging activity around the building along tree lines was observed during most of the survey, along with social calls, swarming and bats chasing each other.

**Incidental observations:** A barn owl was seen near B15.

**Survey constraints:** The view of the south aspects was restricted due to vegetation adjacent the building. Features of the building became hard to see 45 minutes after sunset.

**Table 21 - All Bat Activity Recorded During Survey 3 (B15) 09/06/2021. Refer to Fig. 6, photo 7, photo 8 and photo 9.**

| Time (24 Hrs) | Surveyor [31] | Species[32] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 21:49 | HW | Ppip | 1 | Flying close to B15, from the east heading west towards the trees. | |
| 21:50 | RW | Ppip | 1 | Flying around the trees and close to B15 in front of the west elevation. | |
| 21:53 | RW | Ppip | 1 | Possible emergence from the eaves, did not see location, circled the trees in the west before flying south. | |
| 21:54 | RW | Ppip | 1 | Flying east to west, below roof height along the south elevation. | |
| 21:55 | RW | Ppip | 1 | Emerged from behind the soffit on the west elevation (R1) and flew south east. | A |
| 21:59 | RW | Ppip | 1 | Foraging south to north around the trees at roof height. | |
| 21:59 | HW | Ppip | 2 | Two bats entered R2 | B |
| 22:00 | RW | Ppip | 1 | Foraging north to south around the trees. | 1 |
| 22:02 | RW | Ppip | 1 | Emerged from behind the soffit, then flew SW. | A |
| 22:04 | HW | Ppip | 5 | Five bats emerged from R2. | B |
| 22:03 – 22:04 | RW | Ppip | 2 | Foraging around the trees and flying back and forth to R1 | A, 1 |
| 22:05 | HW | Ppip | 1 | HNS | |

[31] Rachel Whitaker (RW); Emma Sutton (ES); Hazel Watson (HW)
[32] HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); Ppyg - soprano pipistrelle (*Pipistrellus pygmaeus*)

| Time (24 Hrs) | Surveyor [31] | Species[32] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 22:05 – 22:07 | RW | Ppip | 1 | Foraging around the trees in the west, plus social calls. | 1 |
| 22:06 | ES | Ppip | 1 | HNS, social calls. | |
| 22:07 – 22:13 | HW | Ppip | 10 | Ten bats emerged from R2. Continuous swarming activity around R2. | B |
| 22:07 – 22:09 | RW | Ppip | 2 | Continuously foraging around the trees in the west. | 1 |
| 22:09 | RW | Ppip | 1 | Emerged from behind the soffit on the west elevation and flew SW. | A |
| 22:10 | RW | Ppyg | 1 | Flew south to north, west of B5. | |
| 22:10 | RW | Ppip | 3 | Two bats emerged from R1. A third bat is seen swarming outside R1. | C |
| 22:11 | RW | Ppip | 1 | Emergence from R1 | C |
| 22:11 | ES | Unk | 1 | SNH, emerged from behind soffit on east elevation (R3) and flew south west. | D |
| 22:12 | HW | Ppip | 1 | HNS | |
| 22:12 – 22:22 | RW | Ppip | 6 | Foraging around the trees in the west and circling outside R1, touching the building. | 1 |
| 22:13 | HW | Ppip | 1 | Circling overhead | |
| 22:14 | ES | Ppip | 2 | SNH, emerged from behind soffit on east elevation (R3) and flew south west. | D |
| 22:14 | HW | Ppip | 3 | Three bats emerged from R2. | B |
| 22:14 | RW | Ppip | 2 | Two emergences at R1. | C |
| 22:15 | ES | Pip | 1 | Flying south to north over B15. | |
| 22:15 | HW | Pip | 1 | HNS, brief | |
| 22:16 | ES | Pip | 1 | HNS, brief and distant. | |
| 22:16 | HW | Ppip | 2 | HNS, one pass | |
| 22:17 | ES | Ppip | 1 | HNS, one pass. | |
| 22:17 | HW | Ppip | 1 | HNS | |
| 22:18 – 22:27 | HW | Ppip | 2 | Continuous foraging activity around nearby grassland and trees. | 1 |
| 22:22 | ES | Ppip | 1 | Seen flying south to northwest | |
| 22:23 | RW | Ppip | 1 | Seen flying around trees in the south. | |
| 22:24 | RW | Ppip | 1 | Bat appeared from B15 roofline in the south before flying north-west. | |
| 22:24 – 22:40 | RW | Ppip | ~10 | Continuous foraging around B15 and trees in the west. Swarming activity outside R1, with several bats seen touching the wall. Bats seen chasing each other. Plus, social calls. | 1 |
| 22:25 | ES | Ppip | 1 | Commuting over B15, flying from south to northeast. | |
| 22:25 - 22:26 | ES | Ppip | 1 | HNS, intermittently. | |
| 22:28 | RW | Nnyc | 1 | HNS | |
| 22:29 | ES | Ppip | 1 | Flying south to west over B15. | |
| 22:29 – 22:33 | HW | Ppip | 2 | Continuous foraging activity. | |
| 22:34 – 22:36 | HW | Unk | 3 | Circling close to B15, | |
| 22:34 | ES | Ppip | 1 | HNS, two passes. | |
| 22:35 | ES | Ppip | 1 | Appeared from around the corner of east elevation and flew west. | |
| 22:36 | ES | Ppip | 1 | Seen repeatedly flying back and forth towards R3, but did not enter, flew SW | E |
| 22:36 – 22:43 | HW | Unk | 3 | Circling activity close to B15. | |
| 22:38 | ES | Ppip | 1 | Flying from south to west over B15 | |

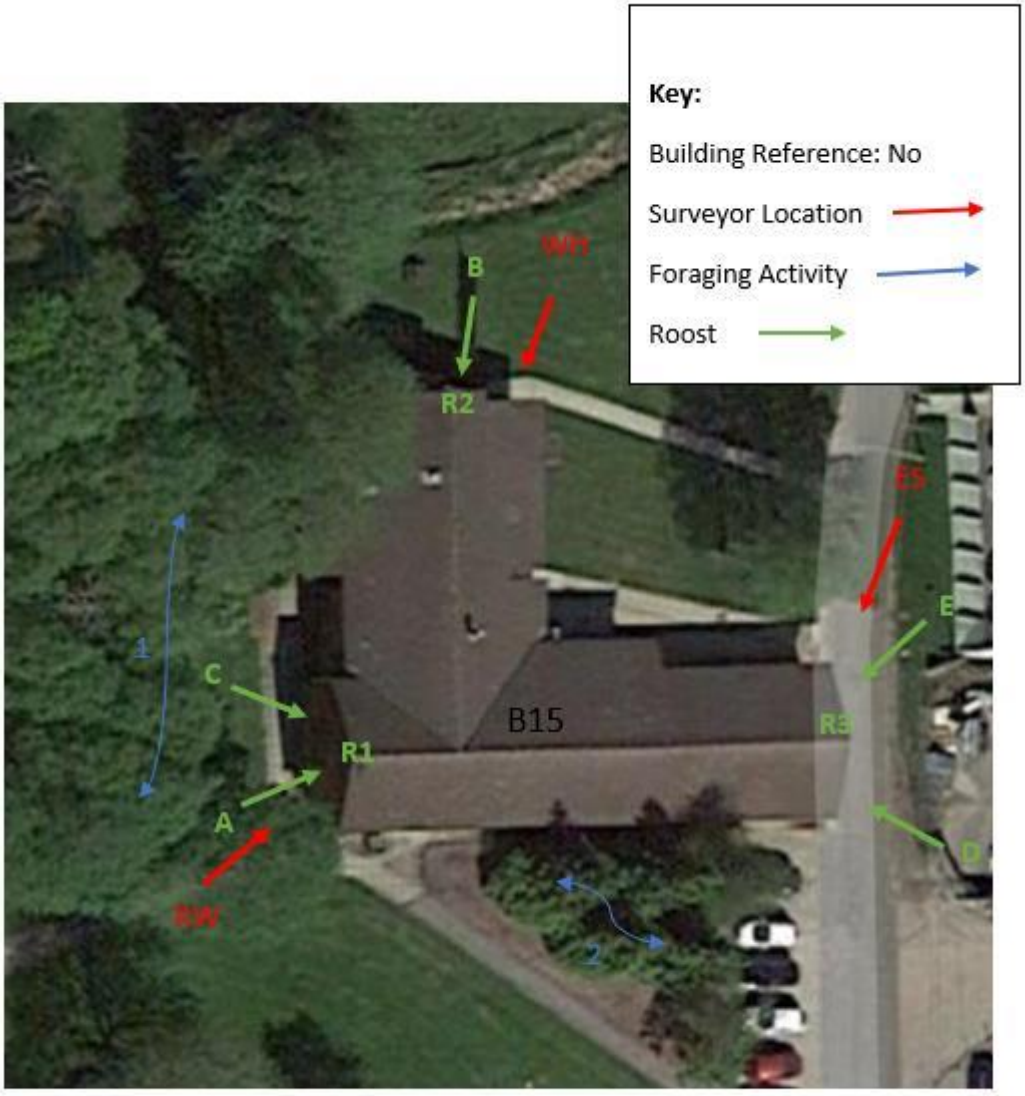
| Time (24 Hrs) | Surveyor [31] | Species[32] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 22:40 – 22:42 | ES | Ppip | 1 | HNS, foraging intermittently. | |
| 22:40 – 22:50 | RW | Ppyg | 3 | Foraging activity continues around B15 and trees | 1,2 |
| 22:44 – 22:56 | HW | Unk | ~3 | Continuous bat activity | |
| 22:45 | ES | Ppip | 1 | HNS, social calls | |
| 22:46 | ES | Ppip | 1 | HNS, two passes. | |
| 22:47 – 22: 48 | ES | Ppip | 1 | HNS, intermittent foraging | |
| 22:50 | RW | Ppip | 1 | Possibly seen re-entering R1. | C |
| 22:50 | ES | Ppip | 1 | HNS, one pass | |
| 22:50 – 22:57 | RW | Ppip | 1 | Intermittent foraging around B15. | |
| 22:54 | ES | Unk | 1 | SNH, entering R3. | D |
| 22:55 | ES | Ppip | 1 | Seen flying from west to north-east | |
| 22:56 – 23:01 | HW | Unk | 1 | Intermittent bat activity | |
| 22:59 | ES | Pip | 1 | HNS, briefly. | |
| 23:02 | ES | Ppip | 1 | HNS, two passes. | |
| 23:05 | ES | Ppip | 1 | HNS, one pass. | |
| 23:05 | RW | Ppip | 2 | Foraging around B15 | 1,2 |
| 23:06 | ES | Ppip | 1 | HNS, one pass. | |
| 23:07 | ES | Nnoc | 1 | HNS | |
| 23:07 | RW | Nnoc | 1 | HNS | |
| 23:09 | HW | Unk | 1 | HNS, social calling | |
| 23:09 | RW | Nnyc | 1 | HNS faintly. | |
| 23:09 | ES | Nnyc | 1 | HNS | |
| 23:10 | RW | Ppip | 1 | HNS, foraging nearby. | 1,2 |
| 23:11 | RW | Unk | 1 | SNH, flying around in front of the west elevation at roof height. | |
| 23:12 – 23:14 | RW | Ppip | 1 | HNS, foraging nearby. | 1,2 |
| 23:14 | ES | Ppip | 1 | HNS, commuting | |
| 23:14 – 23:16 | RW | Ppip | 2 | Foraging around the west elevation, plus, social calls. | 1 |
| 23:15 | ES | Ppip | 1 | HNS, two passes. | |
| 23:16 | ES | Ppip | 1 | Flew over top of B15, east to west. | |
| 23:16 – 23:39 | RW | Ppip | 1 | Foraging around B15 below roof height. | 1,2 |
| 23:17 | HW | Unk | 1 | HNS, continuous activity | |
| 23:17 – 23:19 | RW | Unk | 1 | SNH, circling around the west gable's corner | |
| 23:19- 23:22 | ES | Pip | 1 | HNS, intermittently with multiple passes. | |
| 23:21 | RW | Ppip | 2 | Flew from the north towards R1 and possibly re-entered the roost. | C |
| 23:21 | HW | Unk | 2 | Circling repeatedly together close to R2. Plus, chasing behaviour. | |
| 23:23 | RW | Ppip | 2 | Flew from the roofline of the south elevation towards the north. | |
| 23:23 | ES | Ppip | 1 | Seen flying back and forth towards R3, but did not enter. | D |
| 23:24 | RW | Unk | 2 | SNH, Circling outside R1. | |
| 23:24 | ES | Ppip | 1 | HNS, foraging. | |
| 23:27 | ES | Ppip | 1 | HNS, foraging | |
| 23:29 | ES | Ppip | 1 | Flew towards apex of east gable (R3), touched the wall repeatedly then flew southwest. | |
| 23:31 | ES | Ppip | 1 | Flew towards apex of east gable (R3) touched the wall repeatedly then flew southwest | |
| 23:32 | ES | Ppip | 1 | HNS | |

| Time (24 Hrs) | Surveyor [31] | Species[32] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 23:34 – 23:40 | HW | Unk | 3 | Circling adjacent B15 near security light. With the occasional visit back and forth to R2. | |
| 23:34 – 23:35 | ES | Ppip | 1 | HNS, intermittently. | |
| 23:36 | ES | Ppip | 1 | Emerged from R3 | E |
| 23:36 | ES | Ppip | 1 | Seen flying toward R3 then flew north west | |
| 23:40 | ES | Ppip | 1 | Flew back and forth towards R3, then flew south west. | |
| 23:41 – 23:43 | ES | Ppip | 1 | Seen flying around trees close to north elevation. | |
| 23:44 | ES | Ppip | 1 | Flew back and forth towards R3, then flew south west. | |

**Table 22 - Summary of Roosts Identified B15 (Survey 3) 09/06/21**

| Building Ref. | Roost Ref. | Species | Count | Roost location | Access Point |
|---|---|---|---|---|---|
| B15 | R1 | Common Pipistrelle | 10 | Gable Eaves, West Elevation | Soffit |
| | R2 | Common Pipistrelle | 22 | Eaves North Elevation | Soffit |
| | R3 | Common Pipistrelle | 4 | Gable Eaves, East Elevation | Soffit |

**Figure 6 - Summary of surveyor location, identified roost locations and annotated bat activity during the dusk emergence survey on building 15 (Survey 3) 09/06/21.**




**Roost Photographs:**

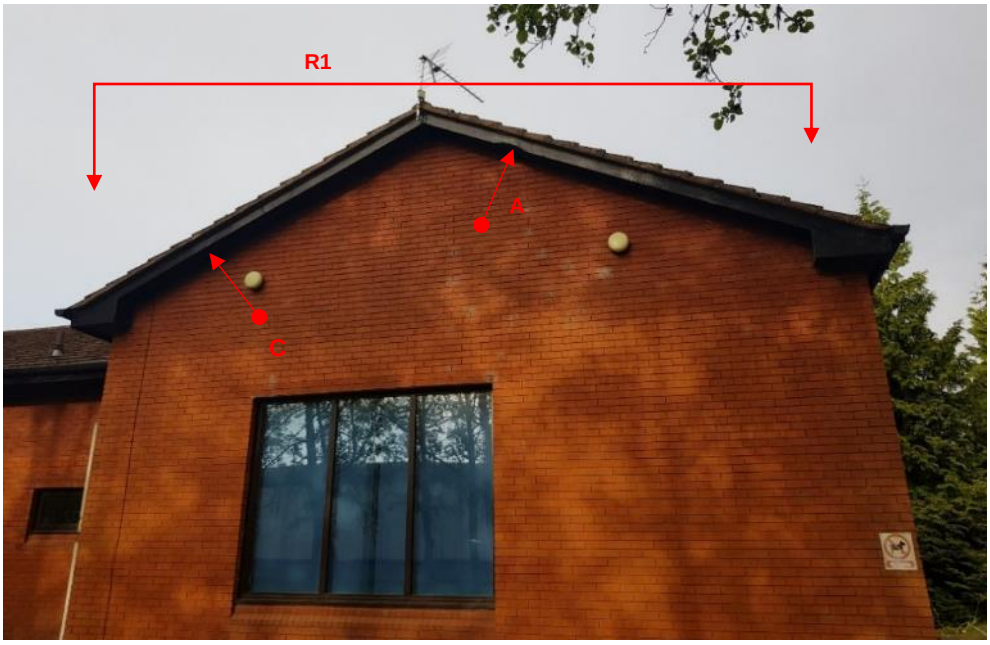



**Photo 7 – B15, Location of Roost 1 (Common Pipistrelle), at the eaves of B15 (West elevation).**

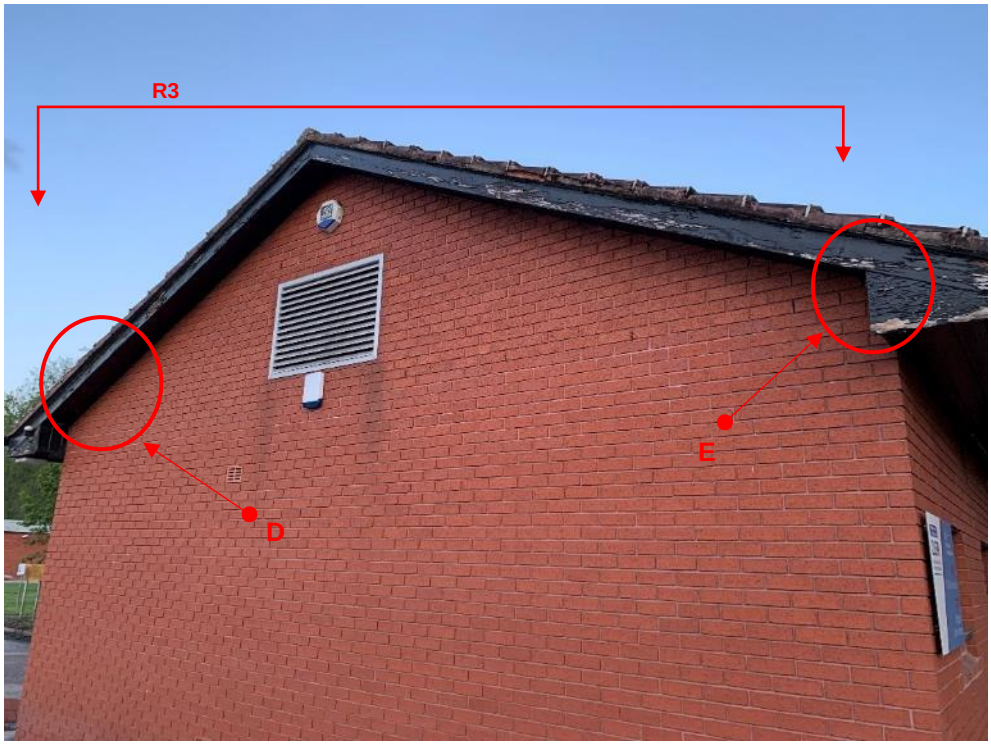



**Photo 8 – B15, Location of Roost 3 (Common Pipistrelle), at the eaves of B15 (East elevation).**


**Photo 9 – B15, Location of Roost 2 (Common Pipistrelle), at the eaves of B15 (North elevation).**

# Appendix 3 – Vantage Point Survey Results

## Building B15 – 22nd June 2021

**Survey site:** CGO001 Building B15
**Date:** 22/06/21
**Sunset:** 2145
**Start:** 2115
**End:** 2245
**Weather conditions:** dry, 0% cloud cover, BWS 0, start/end temp: 17°C
**Surveyors:** Karl Harrison (KH), Will Steele (WS)
**Equipment:** 2X Pettersson M500 & tablet

**Survey summary:** Previous emergence and re-entry surveys had shown that Building 15 contained a significant bat roost. A commuting survey was undertaken on 22nd June 2021 to establish the behaviour and direction of travel of bats after leaving the roost, and to identify important commuting routes for the bats at this site. About 180 Common Pipistrelles were observed emerging from their roost on the north gable end of Building 15, the vast majority of which flew around the west side of the building and headed south. A second surveyor watching from just south of the building recorded over 200 bats proceeding south, most of which were presumably those that had come out of the building, although a small number of additional bats following the same southward trajectory may have originated at different roost sites (either in the same building or elsewhere). Only a few bats were observed travelling north by either surveyor, including 2 that emerged from the same roost as the majority of southbound individuals. Accounting for a large overlap in the bats recorded by the two surveyors, approximately 230 bats were seen in total during the survey.

**Incidental observations:** None

**Survey constraints:** None

**Table 1 - All Bat Activity Recorded During Survey (B15) 22/06/2021. Refer to Fig. 1.**

| Time (24 Hrs) | Surveyor[1] | Species[2] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 2130 | KH | Ppip | 1 | Flew off to south | 2 |
| 2131 | KH | Ppip | 1 | Flew off to south | 2 |
| 2141 | KH | Ppip | 2 | Came out from north, flew off to south | 2 |
| 2144 | KH | Ppip | 1 | Flew off to south | 2 |
| 2145 | WS | Ppip | 2 | Emerged from R1 and flew south or into trees to W of building | 1 |
| 2145 | KH | Ppip | 4 | Flew off to south | 2 |
| 2146 | WS | Ppip | 3 | Emerged from R1 and flew south or into trees to W of building | 1 |
| 2146 | KH | Ppip | 1 | Flew off to south | 2 |
| 2147 | KH | Ppip | 7 | Flew off to south | 2 |
| 2147 | KH | Ppip | 1 | Flew south to north | 6 |
| 2148 | WS | Ppip | 7 | Emerged from R1 and flew south or into trees to W of building | 1 |
| 2148 | KH | Ppip | 3 | Flew off to south | 2 |
| 2148 | KH | Ppip | 1 | Flew north | 6 |
| 2149-2218 | WS | Ppip | 167 | Emerged from R1 and flew south or into trees to W of building | 1 |
| 2149 | KH | Ppip | 1 | Heard not seen | |
| 2149 | KH | Ppip | 4 | Flew off to south | 2 |
| 2150 | KH | Ppip | 5 | Flew off to south | 2 |

[1] Will Steele (WS); Karl Harrison (KH);
[2] HNS - Heard not seen; Ppip - common pipistrelle (*Pipistrellus pipistrellus*)

| Time (24 Hrs) | Surveyor[1] | Species[2] | No. bats | Bat Activity | Map Annotation |
|---|---|---|---|---|---|
| 2151 | KH | Ppip | 14 | Flew off to south | 2 |
| 2152 | KH | Ppip | 5 | Flew off to south | 2 |
| 2153 | KH | Ppip | 6 | Flew off to south | 2 |
| 2154 | KH | Ppip | 4 | Flew off to south | 2 |
| 2155 | KH | Ppip | 14 | Flew off to south | 2 |
| 2156 | KH | Ppip | 21 | Flew off to south | 2 |
| 2157 | KH | Ppip | 17 | Flew off to south | 2 |
| 2158 | KH | Ppip | 8 | Flew off to south | 2 |
| 2158 | KH | Ppip | 1 | HNS | |
| 2159 | KH | Ppip | 5 | Flew off to south | 2 |
| 2200 | KH | Ppip | 6 | Flew off to south | 2 |
| 2200 | KH | Ppip | 1 | Flew north | 6 |
| 2201 | KH | Ppip | 11 | Flew off to south | 2 |
| 2202 | KH | Ppip | 9 | Flew off to south | 2 |
| 2203 | KH | Ppip | 6 | Flew off to south | 2 |
| 2203 | KH | Ppip | 1 | Flew north | 6 |
| 2204 | KH | Ppip | 2 | Flew off to south | 2 |
| 2205 | KH | Ppip | 13 | Flew off to south | 2 |
| 2205 | WS | Ppip | 1 | Emerged from R1 and flew north | 4 |
| 2206 | KH | Ppip | 7 | Flew off to south | 2 |
| 2207 | KH | Ppip | 6 | Flew off to south | 2 |
| 2207 | WS | Ppip | 1 | Flew northeast over building | 3 |
| 2207 | WS | Ppip | 1 | Commuting south past building | 5 |
| 2208 | KH | Ppip | 6 | Flew off to south | 2 |
| 2209 | KH | Ppip | 1 | Flew off to south | 2 |
| 2209 | WS | Ppip | 2 | Emerged from behind fascia left of main roost | 1 |
| 2210 | KH | Ppip | 5 | Flew off to south | 2 |
| 2214 | KH | Ppip | 5 | Flew off to south | 2 |
| 2214 | KH | Ppip | 1 | Flew north | 6 |
| 2215 | KH | Ppip | 2 | Flew off to south | 2 |
| 2215 | KH | Ppip | 1 | Flew north | 6 |
| 2215 | KH | Ppip | 2 | HNS | |
| 2215 | WS | Ppip | 1 | Flew south past building | 5 |
| 2217 | KH | Ppip | 1 | Flew off to south | 2 |
| 2217 | KH | Ppip | 2 | HNS | |
| 2217-2229 | WS | Ppip | 1 | Foraging in trees to west of building | |
| 2218 | KH | Ppip | 3 | Flew off to south | 2 |
| 2219 | KH | Ppip | 3 | Flew off to south | 2 |
| 2222 | KH | Ppip | 1 | Over roof | |
| 2225 | KH | Ppip | 2 | Flew off to south | 2 |
| 2225 | KH | Ppip | 1 | Flew north | 6 |
| 2228 | KH | Ppip | 1 | Flew off to southwest | 2 |
| 2229 | KH | Ppip | 1 | Foraging overhead briefly | |
| 2230 | KH | Ppip | 2 | Flew off to south | 2 |
| 2232 | KH | Ppip | 1 | Flew off to south | 2 |
| 2232 | KH | Ppip | 1 | HNS | |
| 2235 | KH | Ppip | 1 | HNS | |
| 2239 | KH | Ppip | 1 | Flew off to south | 2 |
| 2239 | KH | Ppip | 1 | Flew north | 6 |
| 2241 | KH | Ppip | 1 | Flew off to south | 2 |
| 2241 | KH | Ppip | 1 | Flew north | 6 |

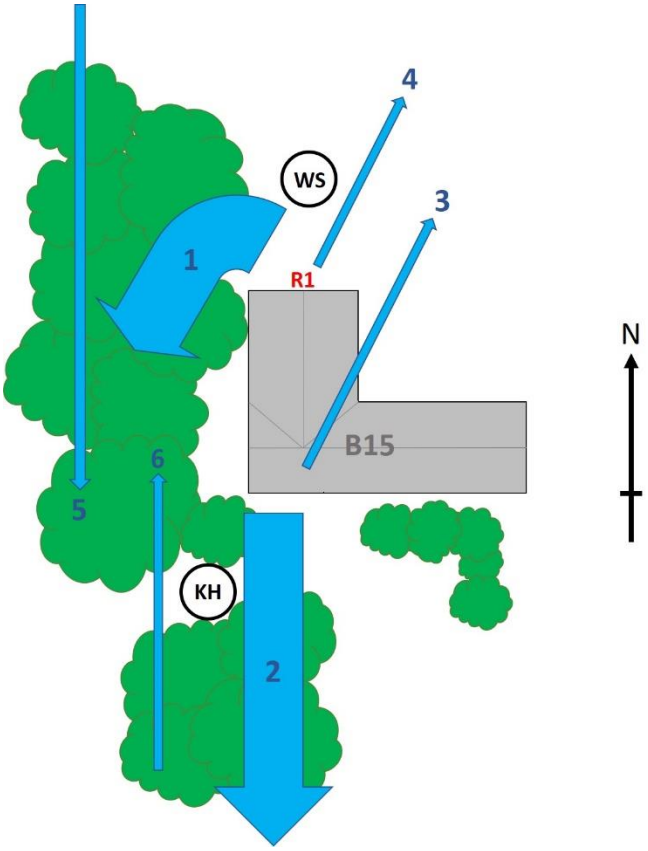



**Figure 1.** Diagram of Building 15 including positions of surveyors (WS = Will Steele, KH = Karl Harrison) during the bat survey on 22/06/2021. R1 indicates the roost site in the building from which bats were seen emerging. Numbered blue arrows denote observed directions of bat travel, as referenced in Table 1. The broad arrows (1 and 2) represent the main trajectories observed being taken by bats.