



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

Reptile survey for proposed new prison on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire

CGO Ecology Ltd
Christchurch

16th August 2021

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1	10/05/2021	n/a
2	16/08/2021	Title change, document control, updated 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 to the south of HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on a 25ha site (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council. A Preliminary Ecological Appraisal by Ramboll identified a few local records of grass snake *Natrix helvetica*, and recommended a reptile survey.

Methodology

An initial walkover was conducted by Dr Chris Gleed-Owen MCIEEM on 1st February 2021, to identify all areas of habitat suitable for reptiles on site. This was followed by a set-up visit on 2nd March 2021, to deploy artificial refugia (roofing felt mats 50cm x 30cm in size). 120 artificial refugia were laid in transects of 10, with a spacing of 5m between refugia. After three weeks, seven survey visits were conducted between 24th March and 4th 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 Phoebe Collier, Amy Dennett, 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 and field boundaries, and patches of scrub. These are relatively well connected, but there are no extensive areas of habitat suitable for reptiles.

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.

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1. Introduction

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a reptile survey to the south of HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on a 25ha site (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council.



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



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

Reptiles are protected by the Wildlife and Countryside Act 1981 (as amended). A Preliminary Ecological Appraisal (PEA) conducted by Ramboll (Molesworth, 2021) included a 2km search with Leicestershire and Rutland Environmental Records Centre (LRERC). This returned seven records of grass snake (*Natrix helvetica*) within 2km of the site, including one 315m east of the site in 2008, and 860m north of the site in 2014. No other reptile records are held by LRERC. On this basis, a reptile survey was recommended.

2. Methodology

An initial walkover was conducted by Dr Chris Gleed-Owen MCIEEM on 1st February 2021, to identify all areas of habitat suitable for reptiles on site. This was followed by a set-up visit on 2nd March 2021, to deploy artificial refugia (roofing felt mats 50cm x 30cm in size). 120 artificial refugia were laid in transects of 10, with a spacing of 5m between refugia.

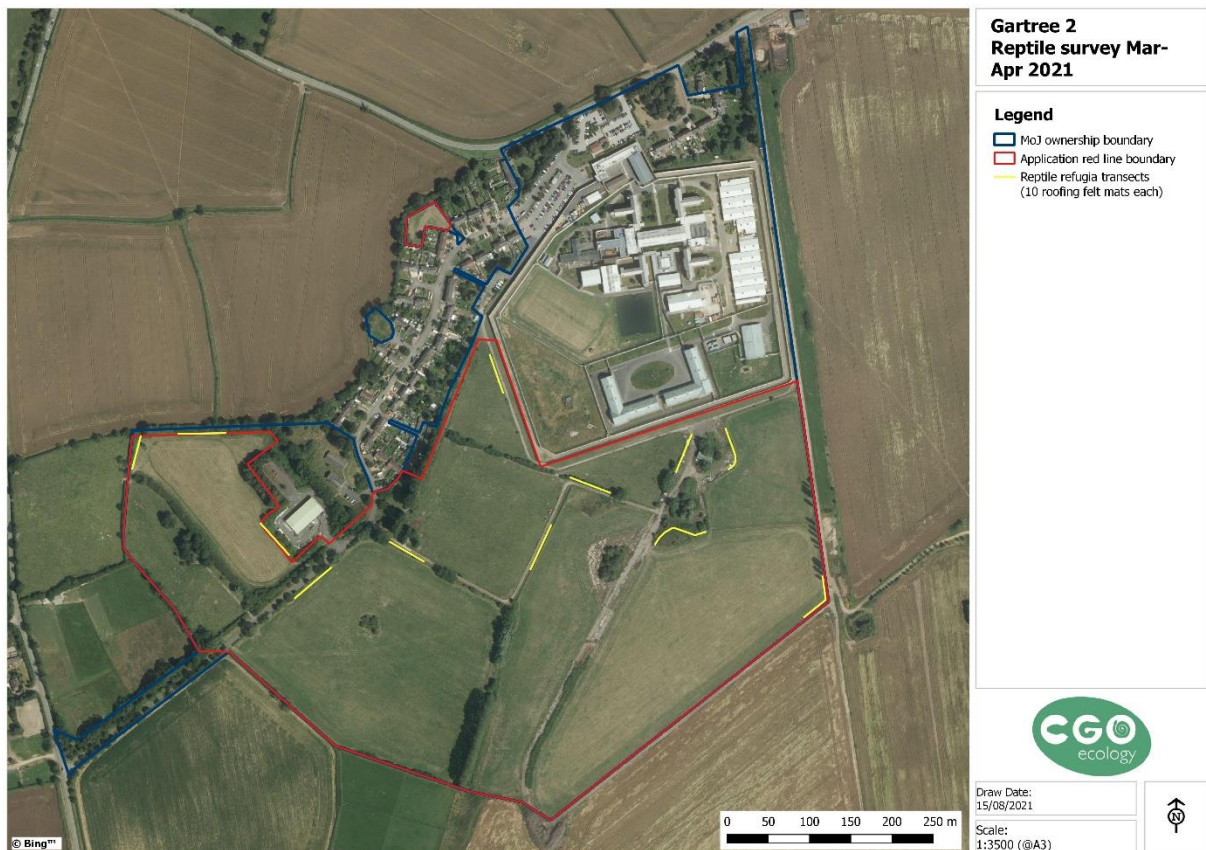


Figure 3 – Reptile survey artificial refugia transects within proposed development boundary (red line) and wider MoJ ownership (blue boundary).

After three weeks, seven survey visits were conducted between 24th March and 4th 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 Phoebe Collier, Amy Dennett, and Chris Gleed-Owen, all experienced reptile ecologists.

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).

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 10-20°C, or warm overcast weather at 13-20°C. 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 10°C (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	02/03/2021	n/a	n/a
PC	V1	24/03/2021	10:50-13:20	10-13C, 40% cloud, intermittent sun
AD	V2	26/03/2021	13:00-15:30	10C, 90% cloud, sunny intervals, recent rain
PC	V3	08/04/2021	13:20-16:00	12C, 90% cloud, sunny intervals
AD	V4	20/04/2021	10:45-13:30	14-15C, 0% cloud, sunny
PC	V5	23/04/2021	16:15-19:00	16C, 30% cloud, intermittent sun
AD	V6	27/04/2021	09:35-12:15	10C, 90% cloud, sunny intervals
CGO	V7	04/05/2021	14:00-17:00	10C, 20-100% cloud, intermittent sun, showers

Table 1 – Survey details. CGO = Chris Gleed-Owen, PC = Phoebe Collier, AD = Amy Dennett.

3. Results

No reptiles were encountered on any of the survey visits. The only suitable habitat areas are narrow strips of rough grassland along hedgerows and field boundaries, and patches of bramble (*Rubus fruticosus* agg.) and blackthorn (*Prunus spinosa*) scrub. These strips of habitat are relatively well connected, but there are no extensive areas of habitat suitable for reptiles.

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 LRERC search results show that reptiles are scarce in the area, and most species are completely absent from the local landscape. For example, slow-worm (*Anguis fragilis*) might be expected in some of the rough grass fringes of the site, but it is locally absent, and therefore unlikely to be found anywhere on site.

No reptile mitigation is required, and no targeted enhancements are recommended. The creation of additional ponds which will increase the local amphibian population is likely to have an indirect benefit to grass snakes, and could encourage a resident subpopulation. The creation of meadow grassland habitats would generate additional capacity to support reptiles if they were present in the area. As it stands, however, translocation would be the only likely way of slow-worms and other species colonising the site.

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) *Raven. Preliminary Ecological Appraisal*. Ramboll, Exeter.

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



Plate 1 – Artificial refuge (roofing felt mat) on rough grass field edge adjacent to Welland Avenue.



Plate 2 – Reptile survey mat on suitable habitat (rough grass and rubble mounds) in agricultural yard adjacent to HMP Gartree.



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Invasive Non-Native Species survey for proposed new prison on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire

CGO Ecology Ltd
Christchurch

16th August 2021

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2	12/05/2021	Figure 3 correction
3	16/08/2021	Title change, document control, updated drawings. Second survey visit added.

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 to the south of HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on a 25ha site (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council. A Preliminary Ecological Appraisal by Ramboll recommended an INNS survey.

Methodology

A thorough walkover was conducted by Dr Chris Gleed-Owen MCIEEM on 4th May and 5th July 2021, to identify any stands of invasive plants and animals, especially along watercourses, ditches, hedgerows, field boundaries, and disturbed areas. The locations, species, and stand sizes of all INNS plants were recorded. The locations and species of any INNS animals were recorded.

Results

Few INNS were recorded. The only Wildlife and Countryside Act 1981 (as amended) Schedule 9 species (illegal to release/plant or allow to spread) are several isolated wall cotoneaster shrubs on the northern fringes of the site. Pheasant was recorded, which is likely to be added to Schedule 9 by Defra soon. The only other notable INNS plant was ground-elder, which is present on the Welland Avenue verge. There are rows of non-native black poplar, Lombardy black poplar and Leyland cypress on site, but no other non-native trees were observed. Aside from agricultural crop species and 'weeds', the site has a low occurrence of INNS and other non-native species.

Conclusions and mitigation recommendations

A Biosecurity Plan must be in place throughout the development process, to prevent accidental or deliberate import or spread of INNS. Existing INNS stands must be dealt with appropriately, and eradicated where possible.

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1. 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 to the south of HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on a 25ha site (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council.

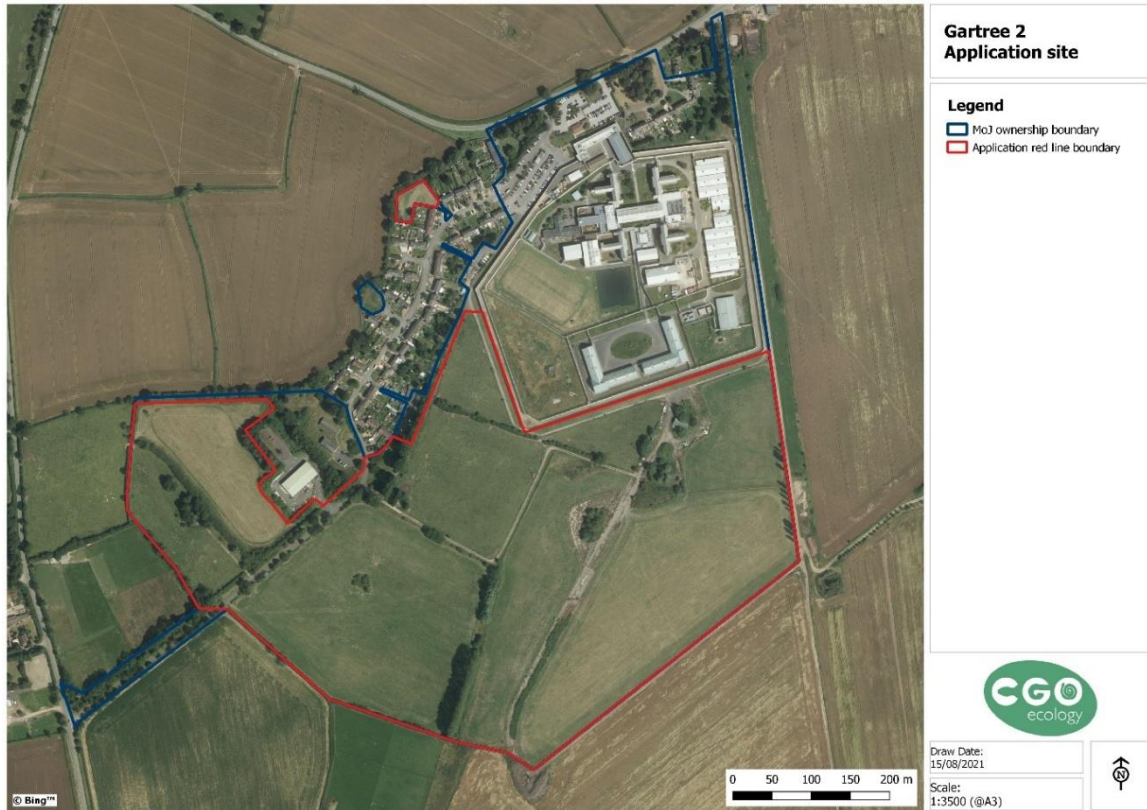


Figure 1 – Development site boundary (red line) and MoJ ownership boundary (blue line).



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

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) conducted by Ramboll (Molesworth, 2020) recommended a survey to map all stands of INNS plants on site.

2. Methodology

A thorough walkover was conducted by Dr Chris Gleed-Owen MCIEEM on 4th May 2021, to identify any stands of INNS plants, especially along watercourses, ditches, hedgerows, field boundaries, and disturbed areas. The locations, species, and stand sizes of all INNS plants were recorded. The locations and species of any INNS animals were also recorded. A second visit was made on 5th July 2021, in case any annuals such as Himalayan balsam had appeared.

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.

The maps in figures 1 and 3 were drawn by GIS technician Jack Parker.

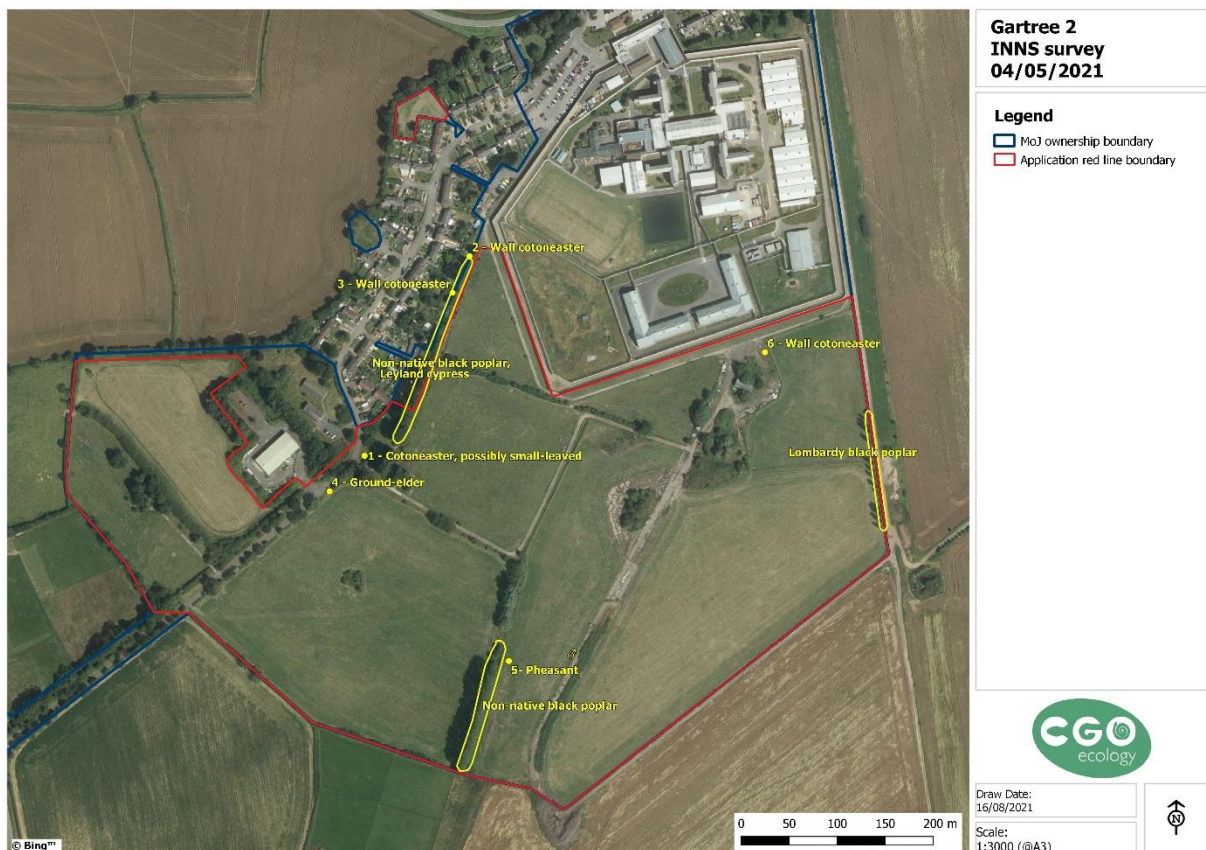


Figure 3 – INNS survey results in relation to proposed development boundary (red line) and wider MoJ ownership (blue boundary).

3. Results

Few INNS were recorded on the first visit, and no additional species or stands on the second. The only Schedule 9 INNS (illegal to release/plant or allow to spread) are several isolated wall cotoneaster shrubs on the northern fringes of the site.

Point 1 on figure 3 is a cotoneaster which appears to be small-leaved cotoneaster (*Cotoneaster microphyllus*). It is only a single, small plant near to houses and the road, therefore probably a garden escape. Points 2, 3, and 6 are wall cotoneaster (*Cotoneaster horizontalis*). Points 2 and 3 are to the rear of residential gardens, and therefore garden escapes. Point 2 is a single bush of 1.5m x 2m in area; point 3 is a stand of 5m x 8m to the south of a derelict Bensons Beds trailer. Point 6 is a cluster of at least four small plants in a disturbed area of rubble and rough grass (former RAF Market Harborough hardstanding) to the south of HMP Gartree. Both cotoneaster species are on Schedule 9 part II.

Point 4, ground-elder (*Aegopodium podagraria*), is the only other notable INNS plant recorded. It is present on the south verge of Welland Avenue, in a stand extending around 30m long, opposite the prison supply yard entrance. Ground-elder is fast-spreading, and could infest whole blocks of woodland and hedgerow in time. Whilst not on Schedule 9, it is a problematic INNS.

There are rows of non-native black poplar (*Populus nigra nigra*), Lombardy black poplar (*Populus nigra nigra* 'Italica' cultivar) and Leyland cypress (*Cupressus leylandii*) on site. These widely-planted introduced tree species are not considered INNS, as they are easy to remove if so desired. No other non-native trees were observed.

There are also a few introduced shrubs on the northern fringes of the site. Along the rear garden fence-lines to the northwest of the site, between points 1 and 2, are a range of garden escapes and introduced shrub hedges. South of HMP Gartree, adjacent to point 6, is a single bush of dogwood (*Cornus* sp). It may be native dogwood (*Cornus sanguinea*) or the North American red osier dogwood (*Cornus sericea*), but was not fully in leaf at the time of survey.

Aside from arable crop species such as maize (*Zea mays*) and agricultural 'weeds', the site has a low occurrence of INNS and other non-native species overall. Most notably, there are no occurrences of the most damaging plants such as Japanese knotweed and Himalayan balsam, and those INNS which were recorded are small isolated stands that would be easy to eradicate.

No current Schedule 9 animals were seen, but ring-necked pheasant (*Phasianus colchicus*) was recorded (point 5 on figure 3). Pheasants are a common sight in the British countryside, but the most common species is not currently listed on Schedule 9, because of its putative economic importance. Ring-necked pheasant is likely to be added to Schedule 9 by Defra soon, however. Grey squirrel was not seen, but could also be present.



Plate 1 – Wall cotoneaster, point 1 on figure 3.



Plate 2 – Wall cotoneaster, point 2 on figure 3.



Plate 3 – Wall cotoneaster, point 3 on figure 3.



Plate 4 – Ground-elder, point 4 on figure 3.



Plate 5 – Ring-necked pheasant, point 5 on figure 3.



Plate 6 – Wall cotoneaster, point 6 on figure 3.

4. Conclusions and mitigation recommendations

The MoJ has confirmed that it will undertake an Eradication Plan in autumn 2021 to remove the existing cotoneasters. A Biosecurity Plan must be in place throughout the development process, to prevent accidental or deliberate import or spread of INNS. This needs to ensure that all contractors, site visitors, and suppliers are aware of the concept of biosecurity and invasive species. Toolbox talks should include an introduction to INNS.

As many INNS plants and animals inhabit waterbodies and wet areas, any work on 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.

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 stands of cotoneaster (points 1, 2, 4, and 6 on figure 3) should be removed whilst still small and manageable. The stand of ground-elder on Welland Avenue will also be targeted for control and eradication.

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

5. References

Molesworth, J. (2020) *Raven. Preliminary Ecological Appraisal*. Ramboll, Exeter.



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Bat roost surveys for new prison on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire

CGO Ecology Ltd
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27th August 2021

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1	18/08/2021	n/a
2	23/08/2021	Clarifications, minor edits.
3	27/08/2021	Change Raven refs in appendix to Gartree 2. Wording change re sheep farm.

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 HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land used to graze sheep, centred on (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council.

Methodology

Brindle & Green Ltd (B&G) undertook dusk and dawn surveys as subconsultants for CGO Ecology Ltd, following recommendations from a Preliminary Ecological Appraisal (PEA) by Ramboll Ltd, adjusted after ground-truthing by B&G In May to June 2021. Dusk emergence and dawn re-entry surveys were undertaken at three buildings and four trees identified as having bat roost suitability, following standard guidelines. The surveys were led by Amy Trewick (CL18-licensed) and Ellen Marshall (CL17-licensed), with other suitably-experienced ecologists with full-spectrum electronic detectors.

Results

No bat emergences or re-entries were detected. Moderate common pipistrelle activity was recorded on all surveys, with a few noctule passes, and occasional registrations of soprano pipistrelle, Nathusius' pipistrelle, and a *Myotis* species.

Conclusions, mitigation, enhancement recommendations

No bat roosts were identified during the surveys, therefore roosting bats are not considered a constraint to the development. Foraging and commuting habitat may be indirectly impacted by disturbance due to lighting and increased traffic during construction. Scheme proposals show that there will be direct loss of these habitats, such as the removal of hedgerows.

Mitigation measures will include a sensitive lighting plan, with no new nocturnal lighting on Welland Avenue. Batboxes will be installed in trees northwest of Welland Avenue, to encourage bat use of those areas. Grassland enhancement there will increase its carrying capacity for invertebrates, and therefore increase the carrying capacity for populations of bats which feed upon them. A separate bat activity report will be issued to assess the impacts on bats using the site for foraging and/or commuting.

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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, to conduct a series of bat emergence/re-entry surveys of potential roosts on land adjacent to HMP Gartree, Market Harborough, Leicestershire (Figure 1). The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SP 7052 8873) (Figure 2). The Local Planning Authority (LPA) is Harborough District Council.

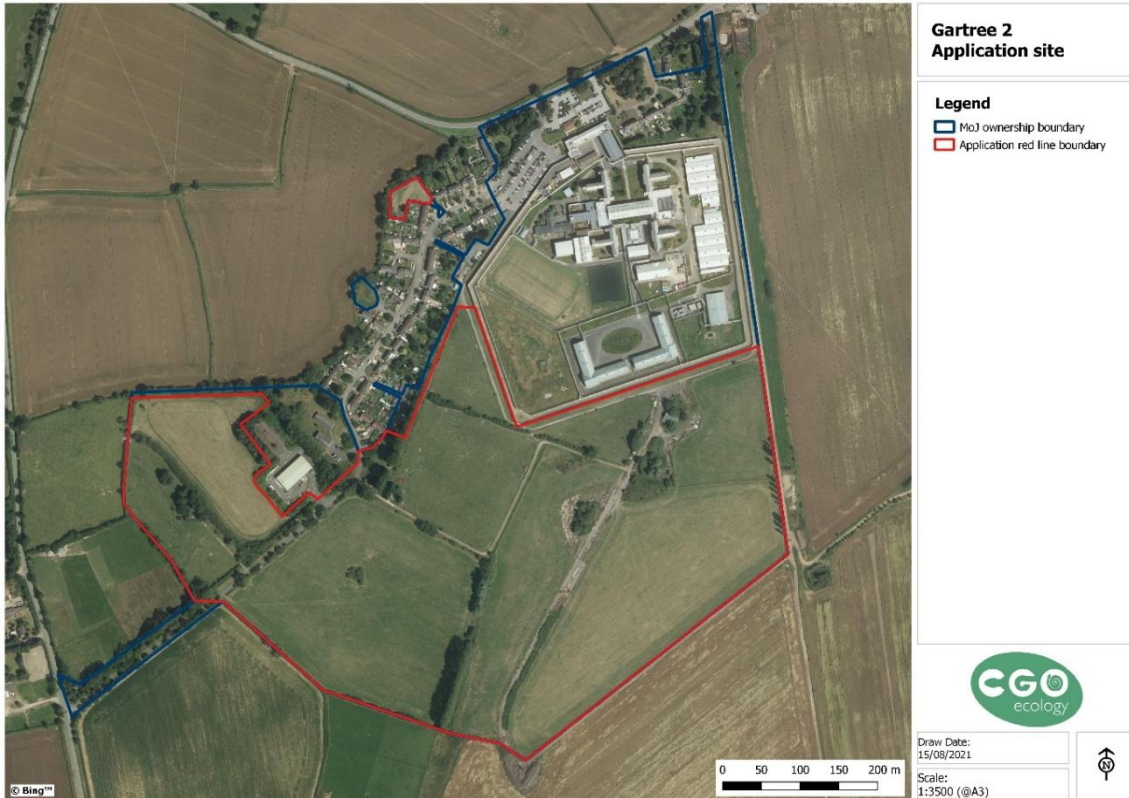


Figure 1 – Proposed development (red line), and MoJ ownership boundary (blue line).



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

1.2. Legal protection

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.

1.3. Authors, surveyors

Lead author Dr Chris Gleed-Owen MCIEEM is Director and Principal Ecologist of CGO, project manager for the Gartree 2 phase 2 ecological surveys. Amy Trewick ACIEEM (Natural England level 2/CL18 bat licence), formerly of Brindle & Green Ltd (B&G), is co-author of this report. She conducted the bat Preliminary Roost Assessment (PRA) of trees and buildings to ground-truth Ramboll's findings, initial bat activity surveys, and other phase 2 surveys for Gartree 2.

B&G was commissioned to carry out the surveys as subconsultant to CGO. The nocturnal bat surveys were led by Amy Trewick (CL18-2018-37960-CLS-CLS) initially, and then by Ellen Marshall (CL17-2017-28407-CLS-CLS), Adrian Cox (CL18-2019-43340-CLS-CLS) and John Harvey (CL17-2018-34117-CLS-CLS), assisted by Kinzie Watts, Veronica Cantero Sanchez, Kerry Baker, Phoebe Collier, and Reece Rockley.

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

1.4. Site context

The development site is land to the south of HMP Gartree, predominantly used to graze sheep. It comprises fields of poor semi-improved grassland, with hedgerows, and lines of trees. The red line includes a wider area to the northwest of Welland Avenue, set aside for Biodiversity Net Gain (BNG) habitat enhancements.

The wider landscape in which HMP Gartree is situated is rural, with arable and pasture farming. It is primarily open in nature, with scattered residential properties and pockets of woodland. Hedgerows and treelines create interconnecting ecological corridors throughout the area. Within 1km to the southeast, a large new residential development at Airfield Farm is expanding the urban area of the town of Market Harborough.

1.5. Proposed works

An Outline Planning Application (OPA) is proposed, with all matters reserved except for access and scale for the construction of a new Category B prison of up to 82,555m² GEA (gross external area) within a secure perimeter fence together with access parking, landscaping, and associated engineering works on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire, LE16 7RP.

The indicative site layout proposes a range of buildings and facilities typical of a Category B resettlement prison, including seven new houseblocks (1,715 prisoners in total), supporting development including kitchen and other facilities, ancillary development including car parking (c.523 spaces), internal road layout, and perimeter fencing. The house blocks will be four storeys 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. MoJ's aspirations include targeting near-zero carbon operations, 10% BNG, and at least BREEAM 'Excellent' certification, with endeavours to achieving BREEAM 'Outstanding'.

2. Methodology

2.1. Desk study

A Preliminary Ecological Appraisal (PEA) conducted by Ramboll (Molesworth, 2020), including a Leicestershire and Rutland Environment Records Centre (LRERC) 2km search. This guided Mace's instruction of phase 2 ecological surveys.

CGO was instructed in December 2020, with bat roost surveys to be conducted in spring/summer 2021. An updated LRERC search was sought by CGO in July 2021. The Defra MAGIC website was also queried (<https://magic.defra.gov.uk/MagicMap.aspx>).

2.2. Preliminary Roost Assessment

Ramboll's PEA (Molesworth, 2020) included a Preliminary Roost Assessment (PRA) of all trees and buildings on site. This recommended nocturnal bat surveys (activity and roost presence-absence). Buildings with low, medium, or high roost potential would need one, two, or three dusk/dawn surveys respectively. Trees with medium or high roost potential would need two, or three dusk/dawn surveys respectively (cf. Collins, 2016).

B&G conducted ground-truthing of the buildings and trees identified by Ramboll (Molesworth, 2020) as requiring further assessment. This was effectively a Preliminary Roost Assessment (PRA) exercise (cf. Collins, 2016). It revised some of the Ramboll findings, and added a building and several trees to the Zone of Influence (Zol) targets that required further survey.

The PRA followed published Covid-19 safety advice (BCT, 2020; CIEEM, 2020; IUCN, 2020).

The ground-truthing/PRA inspections were carried out during daylight hours and in accordance with standard methodology (Collins, 2016). They were aided by a powerful torch and close-focus binoculars from ground level. Internal inspections of buildings were undertaken where possible and safe to do so.

Cavities, cracks, and crevices which may offer potential emergence points or suitable roosting features for bats were identified and, where accessible, were 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.

2.3. Emergence/re-entry surveys

Nocturnal surveys (dusk emergence, dawn re-entry, totalling 18 surveyor sessions) of three buildings (B1-3) and four trees (T1-4) in the Zol took place between 25th May and 21st July 2021. 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.

Surveyors used full-spectrum bat survey and monitoring equipment (Echo Meter Touch 2 detectors paired with iPads) to detect and record bats in the field. 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.

Surveys were carried out from surveyor positions spread around the buildings and trees, 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.

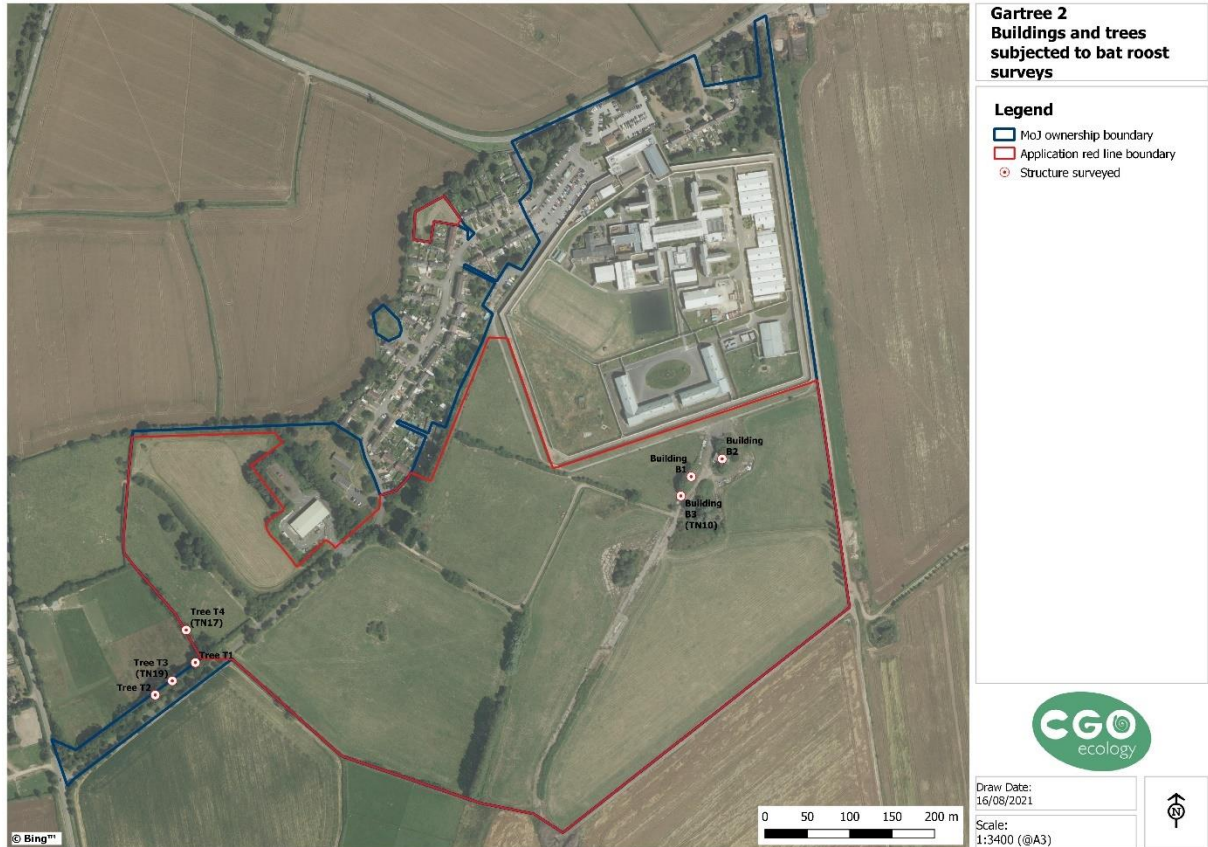


Figure 3 – Buildings and trees subjected to nocturnal surveys for bat roosts.

Building or tree	Grid reference	Position within Zol
Building B1	SP 70648 88890	In development area
Building B2	SP 70688 88917	In development area
Building B3 (TN10)	SP 70640 88872	In development area
Tree T1	SP 70072 88678	Ash tree, north side of Welland Ave.
Tree T2	SP 70026 88648	Ash tree, north side of Welland Ave.
Tree T3 (TN19)	SP 70040 88656	Ash tree in defunct hedge, north side of Welland Ave.
Tree T4 (TN17)	SP 70058 88715	Dead ash tree in intact hedgerow, north of Welland Ave.

Table 1 – Buildings and trees subjected to bat nocturnal surveys, with Ramboll (Molesworth, 2020) PEA target note numbers in parentheses.

2.4. Incidental observations

Sightings of notable wildlife observed during the bat emergence/re-entry surveys were also recorded. In particular, a sighting of barn owl (*Tyto alba*), and negative results from trees with previous barn owl evidence, have been fed into the relevant survey for that species.

2.5. Limitations

There were no significant constraints on the surveys. The surveys were originally scheduled to start in early to mid-May, but they were postponed due to inclement and unseasonably-cold weather. However, the new seasonal position was optimal for all nocturnal surveys.

3. Baseline ecological conditions

3.1. Desk study

Natural England has issued only one European Protected Species (EPS) mitigation licence for bats within 2km, for common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auritus*) around 1.3km south.

The LRERC (2021) search yielded 121 bat records within 2km, comprising common pipistrelle (18 records), soprano pipistrelle (*Pipistrellus pygmaeus*, 10), Nathusius' pipistrelle (*Pipistrellus nathusii*, 5), undetermined pipistrelle (40), brown long-eared bat (10), Daubenton's bat (*Myotis daubentonii*, 3), Natterer's bat (*Myotis nattereri*, 1), undetermined *Myotis* (1), noctule (*Nyctalus noctula*, 12), serotine (*Eptesicus serotinus*, 1), and 20 of unidentified bat species.

The nearest bat record is for a non-specific roost in a property within the Gartree residential estate to the west of the existing prison, outside the ZoI of the proposed development.

3.2. Emergence/re-entry surveys

No bat emergences or re-entries were detected. Therefore, the results of the surveys indicate that bat roosts are likely to be absent from the three buildings in the development area, and from the four trees within the ZoI along Welland Avenue.

Moderate common pipistrelle activity was recorded on all surveys, with a few noctule passes, and occasional registrations of soprano pipistrelle, Nathusius' pipistrelle, and an unidentified *Myotis* species.

Appendix 2 details the species recorded on each survey, with information on weather and timings, and a plan of bat activity observed.

A barn owl emerged from a tree adjacent to a survey position on 14th July 2021 (tree TN16 of Ramboll, 2020). Grey squirrel (*Sciurus carolinensis*) was seen at T2 on 8th June 2021.

4. Impact assessment

No bat roosts were identified and therefore roosting bats are considered absent. The results indicate that bat roosts will not be impacted by the proposed development. However, in the highly-unlikely event that a bat is found during works, then works must cease immediately and CGO Ecology be consulted.

Construction activities could cause an increase in noise, lighting, and other effects along Welland Avenue, which might impact commuting routes and foraging areas.

5. Mitigation

Permanent lighting must be avoided on Welland Avenue, and a sensitive lighting plan be used during construction. No nocturnal lighting will be possible along Welland Avenue, and along retained woodland edges and hedgerows immediately south of HMP Gartree. This is to maintain currently-dark habitat used by foraging and commuting bats.

New habitat provisions will offset the loss of foraging habitat in due course, especially woodland on the south and east edge of the site. However, there will be a lag of up to 30 years before this is fully functional for bats, and a net reduction in available habitats in the short to medium term. New batbox provisions in land northwest of Welland Avenue will be used to encourage use of that area, and to assist in compensating the loss of potential roosting opportunities in buildings lost to the development. Grassland enhancement northwest of Welland Avenue will also provide better foraging habitat than at present.

The final results of the monthly bat activity surveys (April to October 2021) will better inform impact assessment of the development on bat commuting routes and foraging areas, and may require additional mitigation.

6. Residual effects, enhancements

There will be no residual effects on bat roosts after mitigation. Therefore, enhancements are possible by providing additional new roosting habitat for bats.

At least 20 batboxes (artificial roosts), for a range of species and roost types, will be installed in suitable locations on retained trees around the prison estate. The numbers and types of batboxes provided 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.

7. References

BCT (2020) *BCT Response to IUCN COVID-19 Recommendations for Bat Field Workers*. Bat Conservation Trust, London. <https://www.bats.org.uk/news/2020/04/bct-response-to-iucn-covid-19-recommendations-for-bat-field-workers> (Published 16th April 2020)

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Molesworth, J. (2020) *Raven. Preliminary Ecological Appraisal*. Ramboll, Exeter.

8. Appendices

Appendix 1 - Photographs

Appendix 2 - Emergence/re-entry survey results

Appendix 1 – Photographs



Plate 1- Interior of B1.



Plate 2 – View east along Welland Avenue.



Plate 3 – B2 front (west) elevation.



Plate 4 – B2 rear (east) elevation.



Plate 5 – B3 with B1 beyond.



Plate 6 – View west along Welland Avenue.

Appendix 2 – Bat Emergence/Re-entry Survey Results 2021

Survey 1: Building B3 (TN10) – 25th May 2021 (Dusk)

Survey site: Gartree 2, Market Harborough Building B3 (TN10). Surveyor positions: Facing building from Northern and Southern positions.

Date: 25/05/2021.

Sunset/sunrise: 21:07

Start: 20:52.

End: 22:37

Weather conditions:

Start temperature: 13°C. Finish temperature: 8°C.

Precipitation 0, Wind strength 1.5/5, Cloud cover 0/8.

Humidity: High throughout.

Surveyors: John Harvey (JH) & Ellen Marshall (EM).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Brief calls from common pipistrelles and a commuting passage utilising the track and travelling onwards in a Westerly and North-easterly direction. No emergences.

Incidental observations: Full Moon. Curlew heard calling.

Survey constraints: N/A.

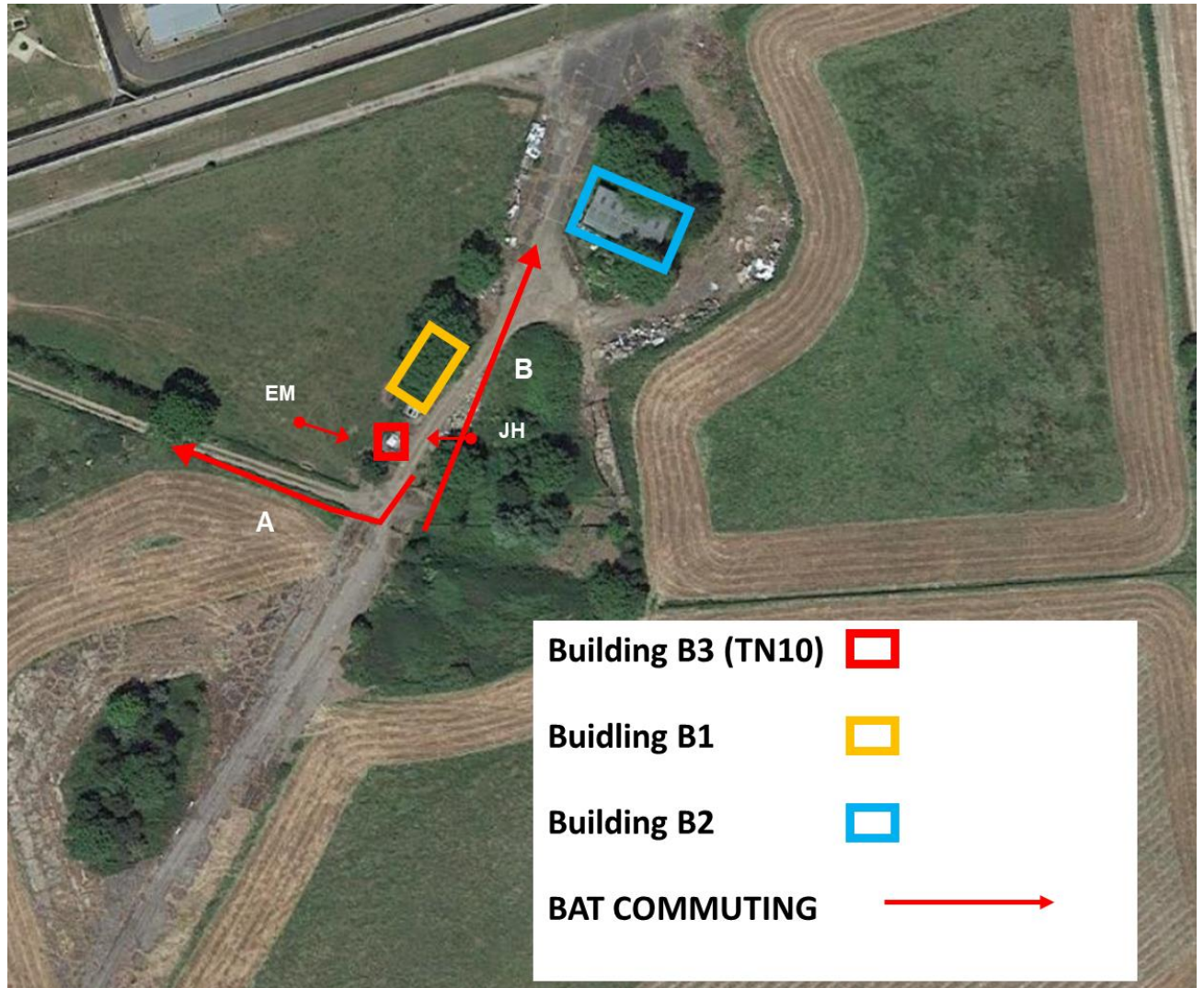
Table 1 - All Bat Activity Recorded During Survey 1 of; Building B3 (TN10) (Dusk) on 25/05/2021 Refer to Fig. 1.

Time (24 Hrs)	Surveyor	Species ¹	No. bats	Bat Activity ²	Map Annotation
21:39	JH	P.pip	1	HNS, Brief call	
21:43	EM	P.pip	1	BC, Up the track and flew West	A
21:51	EM	P.pip	1	HNS	
21:52	JH	P.pip	1	HNS, Brief call	
21:58	JH	P.pip	1	BC, North-Eastern direction	B
22:36	JH	P.pip	1	HNS, Brief call	
22:38	EM	P.pip	1	HNS, Brief pass	

¹ P.pip – Common pipistrelle (*Pipistrellus pipistrellus*).

² HNS – Heard not seen; SNH – Seen not heard; BC – Bat Commuting; BF – Bat Foraging.

Figure 1: Survey 1: Building B3 (TN10) – 25th May 2021 (Dusk) - Activity map.



Survey 1: Tree T3 (TN19) – 8th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T3 (TN19)). Surveyor positions: Facing tree southern aspect.

Date: 08/06/2021.

Sunset/sunrise: 04:42

Start: 03:13.

End: 04:57.

Weather conditions:

Start temperature: 15°C. Finish temperature: 12°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 67%. Humidity finish: 73%.

Surveyors: Ellen Marshall (EM).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Brief calls from Common Pipistrelles, Brown long eared and Myotis species. Sightings of foraging Common Pipistrelles and Brown long eared bats under the canopy and at low level. No bats were observed to return to roost.

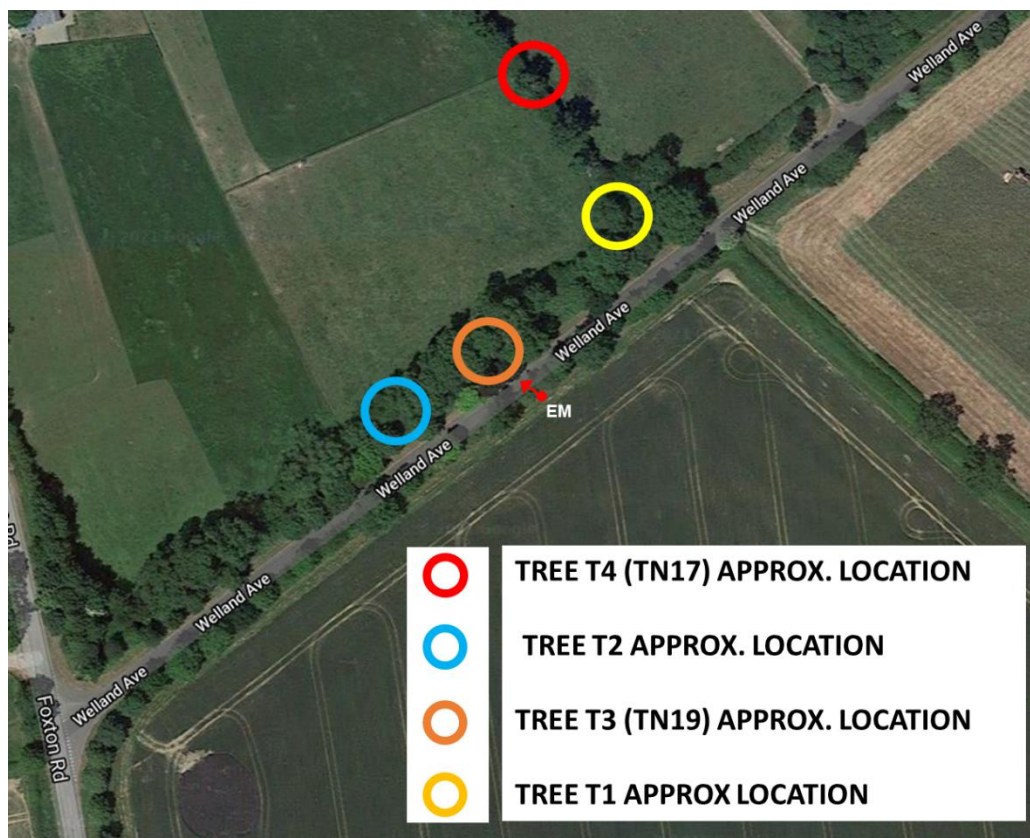
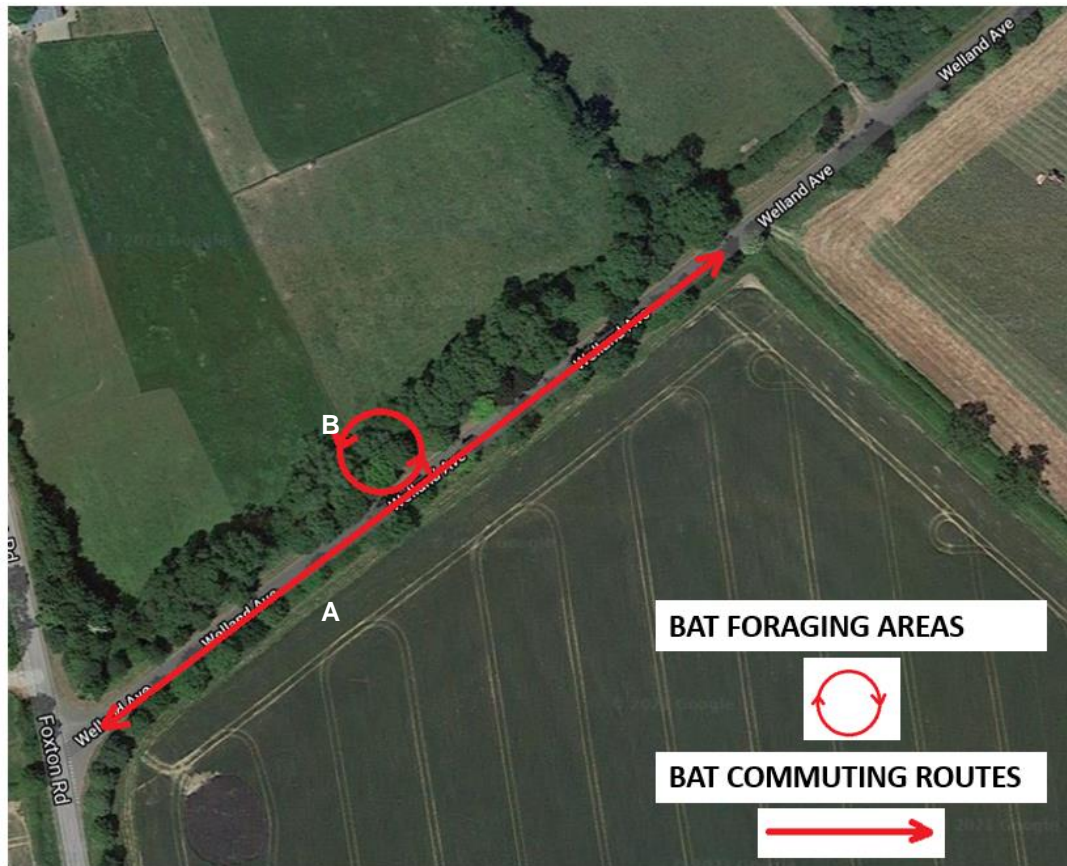
Incidental observations: N/A.

Survey constraints: N/A.

**Table 2 - All Bat Activity Recorded During Survey 1 of; Tree T3 (TN19) (Dawn) on the 08/06/2021
Refer to Fig. 2.**

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
03:18	EM	Ppip	1	HNS but came very close – commuting on road highly possible.	A
03:25	EM	Ppip	1	HNS, Brief calls	
03:35	EM	BLE	1	Circling trunk/foraging from foliage but did not return	B
03:42	EM	Ppip	1	HNS, faint call	
03:47	EM	BLE	1	Flew south into road, low level around seated head height	B
03:49	EM	Ppip	1	Foraging, under the canopy	B
03:52-04:04	EM	Ppip	2	Foraging, low over the vegetation	B

Figure 2: Survey 1: Tree T3 (TN19) – 8th June 2021 (Dawn) - Activity map and Location.



Survey 1: Tree T1 – 8th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T1). Surveyor positions: Facing tree, southern aspect
Date: 08/06/2021.

Sunset/sunrise: 04:42

Start: 03:13.

End: 04:57.

Weather conditions:

Start temperature: 15°C. Finish temperature: 12°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 67%. Humidity finish: 73%.

Surveyors: Adrian Cox (AC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergences or returns. Survey generally very quiet with little bat activity recorded throughout. Feature was near cluttered hedgerow and thick treeline. One species of pipistrelle was recorded briefly under the canopy.

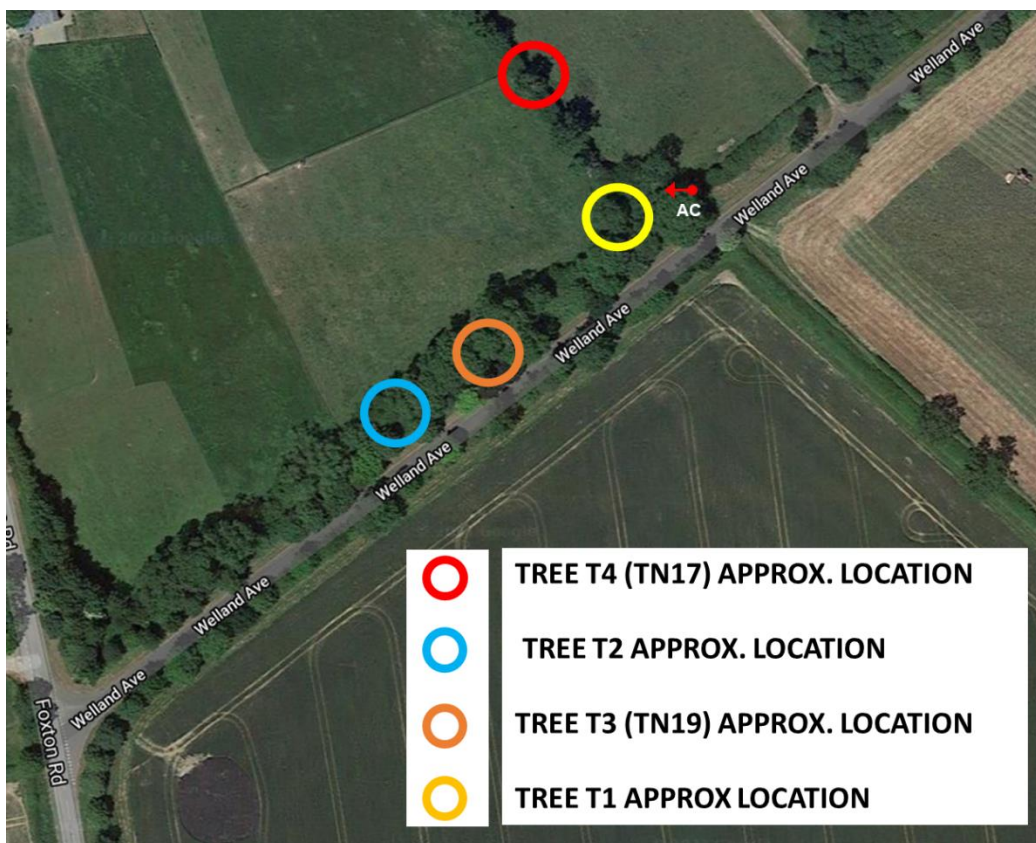
Incidental observations: N/A.

Survey constraints: N/A.

Table 3 - All Bat Activity Recorded During Survey 1 of; Tree T1 (Dawn) on the 08/06/2021 Refer to Fig. 3.

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
03:32	AC	P.pip	1	~3m under the canopy, 2 passes observed	A

Figure 3: Survey 1: Tree T1 – 8th June 2021 (Dawn) - Activity map.



Survey 1: Tree 2 – 8th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T2). Surveyor positions: Facing tree, southern aspect.

Date: 08/06/2021.

Sunset/sunrise: 04:42

Start: 03:13.

End: 04:57.

Weather conditions:

Start temperature: 15°C. Finish temperature: 12°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 67%. Humidity finish: 73%.

Surveyors: John Harvey (JH).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergences/returns recorded. Brief calls from common pipistrelles, brown long eared and *Myotis* species. Sightings of foraging common pipistrelles and brown long eared bats under the canopy and at low level.

Incidental observations: Squirrel noted emerging from the observed feature at dawn

Survey constraints: N/A.

Table 4 - All Bat Activity Recorded During Survey 1 of; Tree T2 on the 08/06/2021 Refer to Fig. 4.

Time (24 Hrs)	Surveyor	Species ³	No. bats	Bat Activity	Map Annotation
03:15	JH	P.pip	1	Bat Activity	
03:17	JH	MYO	1	HNS, Brief calls	
03:25	JH	P.pip	1	HNS, Brief calls	
03:33	JH	BLE	1	HNS, Brief calls	A
03:34	JH	P.pip	1	Flew past towards tree TN19 low flying over ruderal vegetation	
03:42	JH	P.pip	1	HNS	
03:47	JH	BLE	1	HNS	A
03:48-04:04	JH	P.pip	1	Foraging under the canopy	A

³ BLE – Brown long-eared bat (*Plecotus auritus*), MYO – *Myotis* sp.

Survey 1: Tree T4 (TN17) – 11th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T4 (TN17)). Surveyor positions: Facing tree, north eastern and south eastern aspect.

Sunset/sunrise: 04:41

Start: 03:10.

End: 04:55.

Weather conditions:

Start temperature: 17°C. Finish temperature: 17°C.

Precipitation 0, Wind strength 2/5, Cloud cover 7/8.

Humidity start: 92%. Humidity finish: 92%.

Surveyors: Kinzie Watts (KW) and Veronica Cantero Sanchez (VC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergencies/returns recorded. Common pipistrelles foraging within the tree canopy and above the trees, brown long eared foraging and commuting. Myotis species commuting past infrequently. Occasional pass of noctules which locations were assumed commuting over but not seen.

Incidental observations: N/A.

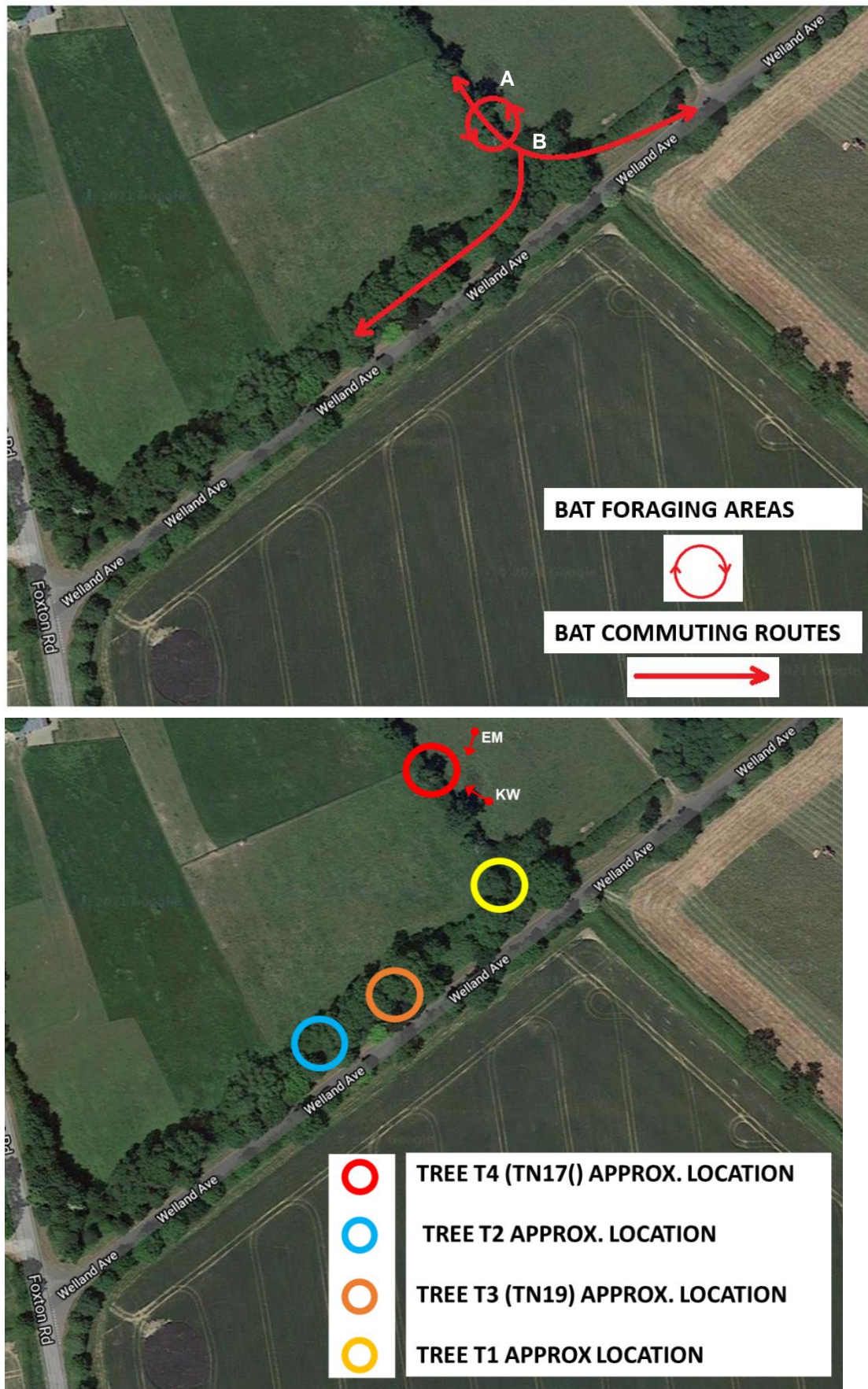
Survey constraints: N/A.

Table 5 - All Bat Activity Recorded During Survey 1 of; Tree T4 (TN17) (Dawn) on the 11/06/2021 Refer to Fig. 5.

Time (24 Hrs)	Surveyor	Species ⁴	No. bats	Bat Activity	Map Annotation
03:10-03:25	KW	P.pip	1-5	BF, continuously around the trees and bats commuting along the East elevation	A
03:25-03:40	KW	P.pip, BLE & MYO	3-9	BF, P.pip in circles above surveyors head and over to Tree 17 - BLE pass and MYO pass	A
03:40-03:55	KW	P.pip & MYO	2-9	BF, P.pip passes with infrequent MYO passes	A
03:55-04:04	KW	P.pip	1-5	Activity less frequent, with P.pip circling and flying to the woodland strip – 04:04 all activity ceased	B
03:12-03:42	VC	P.pip	1-5	BF, continuously around the trees	A
03:25	VC	BLE	1	HNS	
03:27	VC	BLE	1	BF around the trees	
03:34	VC	BLE	1	HNS	
03:45	VC	P.pip	1	HNS	
03:46	VC	BLE	1	BC, Along hedgerow from South to North	B
03:50	VC	P.pip	1	HNS	
03:57	VC	P.pip	1	BF around the trees	
04:36	VC	N.noc	1	HNS	

⁴ N.noc – Noctule (*Nyctalus noctula*)

Figure 5: Survey 1: Tree T4 (TN17) – 11th June 2021 (Dawn) - Activity map.



Survey 1: Building B1 – 22nd June 2021 (Dusk).

Survey site: Gartree 2, Market Harborough Building 1 (Dome Shelter). Surveyor positions: Southern elevation facing North, Northern elevation facing South.

Date: 22/06/2021.

Sunset/sunrise: 21:30.

Start: 21:15.

End: 23:00.

Weather conditions:

Start temperature: 14°C. Finish temperature: 10°C.

Precipitation 0, Wind strength 1/5, Cloud cover 0/8.

Humidity start: 66%. Humidity finish: 73%.

Surveyors: John Harvey (JH) and Veronica Cantero Sanchez (VC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergencies. Common pipistrelles foraging and commuting down the path and around the trees throughout the survey.

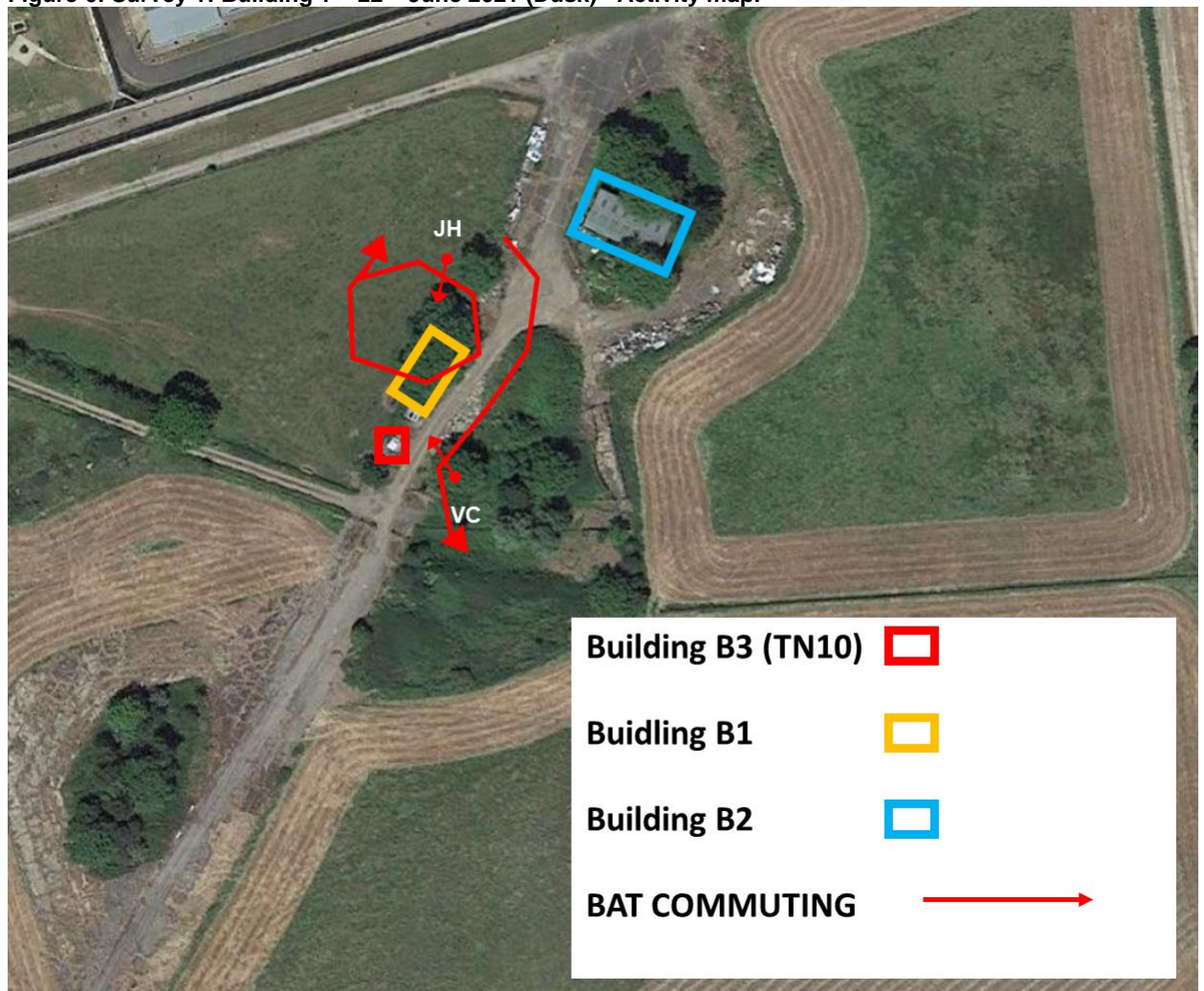
Incidental observations: N/A.

Survey constraints: N/A.

Table 6 - All Bat Activity Recorded During Survey 1 of; Building B1 (Dusk) 22/06/2021 Refer to Fig. 6.

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
22:05	VC	P.pip	1	HNS	
22:09-11	VC/JH	P.pip	1	BF, Over tree canopy	A
22:14	VC	P.pip	1	BF, Over tree canopy	A
22:16	JH	P.pip	1	BC, Down the path	B
22:17	VC	P.pip	1	BF, Over tree canopy	A
22:18	VC	P.pip	1	BF, Down the path and over tree canopy	A
22:18	JH	P.pip	1	BC, Down the path	B
22:22	JH	P.pip	1	BF, Bat circling around the path	A
22:25	VC	P.pip	1	BF, Down the path and over tree canopy	A
22:25	JH	P.pip	1	BC, Down the path	B
22:39	JH	P.pip	1	HNS	

Figure 6: Survey 1: Building 1 – 22nd June 2021 (Dusk) - Activity map.



Survey 1: Building B2– 29th June 2021 (Dusk).

Survey site: Gartree 2, Market Harborough (Building B2). Surveyor positions: Eastern and Western elevations.

Date: 29/06/2021.

Sunset/sunrise: 21:30.

Start: 21:15.

End: 23:00.

Weather conditions:

Start temperature: 13°C. Finish temperature: 14°C.

Precipitation 0, Wind strength 0/5, Cloud cover 2/8.

Humidity start: 81%. Humidity finish: 90%.

Surveyors: Kerry Baker (KB) and Veronica Cantero Sanchez (VC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergences. Generally low levels of activity observed,, with bats primarily commuting through the area, with the majority being in the distance. One common pipistrelle bat sighted foraging in trees to the east of building. Occasional passes of noctules commuting North.

Incidental observations: N/A.

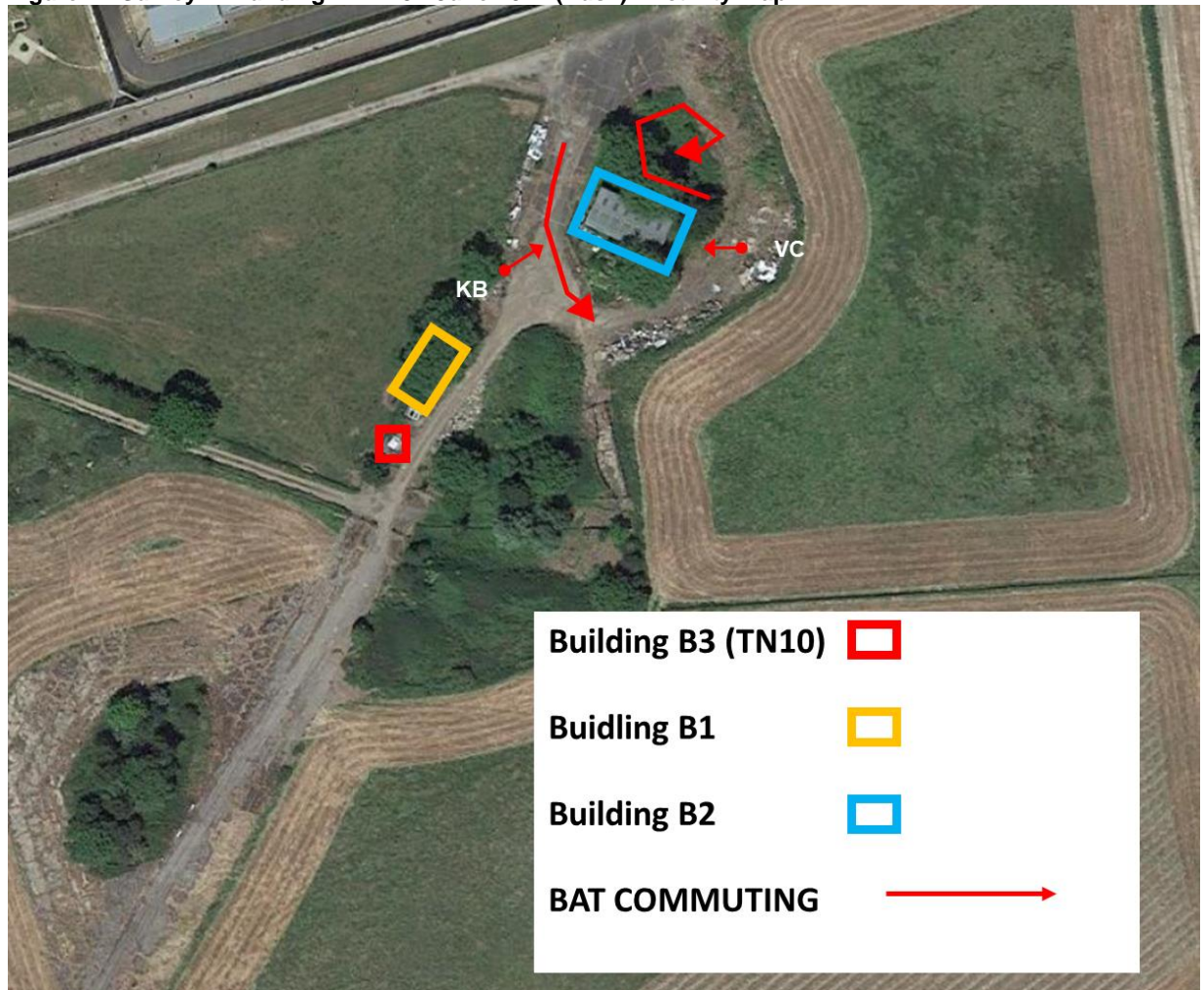
Survey constraints: N/A.

**Table 7 - All Bat Activity Recorded During Survey 1 of; Building B2 (Dusk) on the 29/06/2021
Refer to Fig. 7.**

Time (24 Hrs)	Surveyor	Species ⁵	No. bats	Bat Activity	Map Annotation
22:11	KB / VC	N.noc	1	HNS, Commuting pass	
22:12	VC	N.noc	1	HNS	
22:12	KB / VC	P.pip	1	HNS, Brief pass in the distance	
22:16	VC	P.pip	1	BF at Eastern tree	A
22:16	KB	N.noc	1	HNS, Brief pass in the distance	
22:17	KB	P.pip	1	Brief pass then appeared and commuted	
22:37	KB	P.pyg	1	Faint pass	
22:37	VC	P.pip	1	Brief pass in the distance	
22:49	KB	N.noc	1	HNS, Brief pass in the distance	
22:50	KB	N.noc	1	BC, Overhead North	B
22:50	KB	P.pip	1	HNS BC	
22:56-23:00	KB	P.pip	1	BC, Frequent pulses for 4 minutes	B

⁵ P.pyg – Soprano pipistrelle (*Pipistrellus pygmaeus*)

Figure 7 - Survey 1: Building B2 – 29th June 2021 (Dusk) - Activity map.



Survey 2: Tree T3 (TN19)– 6th July 2021 (Dusk).

Survey site: Gartree 2, Market Harborough Tree T3 (TN19). Surveyor positions: Southern elevation facing North,

Date: 06/07/2021.

Sunset/sunrise: 21:27.

Start: 21:12.

End: 22:57.

Weather conditions:

Start temperature: 13 Degrees Celsius. Finish temperature: 14 Degrees Celsius.

Precipitation 0, Wind strength 0/5, Cloud cover 2/8.

Humidity start: 81%. Humidity finish: 90%.

Surveyors: Ellen Marshall (EM).

Equipment: EM Touch & I-pad/I-phone.

Survey summary: No emergences. Continuous foraging from a pair of common pipistrelles beneath canopy of treeline.

Incidental observations: N/A.

Survey constraints: Survey finished at 22:57 due to onset of high winds and showers.

Table 2 - All Bat Activity Recorded During Survey 2 Tree 3 (TN19) (Dusk) 29/06/2021 Refer to Fig. 1.

Time (24 Hrs)	Surveyor ⁶	Species ⁷	No. bats	Bat Activity	Map Annotation
21:37	EM	P.pip	1	HNS – possibly behind surveyor along road	
21:43 – 21:58	EM	P.pip	2	BF continuously within/beneath tree canopy. Calls indicative of 2x bats and 2x individuals seen until 21:58	A
21:59 – 22:14	EM	P.pip	2	BF activity as before however light levels too low to see bats underneath tree canopy	A
22:46	EM	P.pip	1	BF for sustained periods – HNS however likely that bat activity continued as previously	

HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); MYO – *Myotis* sp (Brandt's, whiskered, Daubenton's, Natter's, Bechstein's); BLE – Brown Long eared.

Survey 2: Tree T2 – 6th July 2021 (Dusk)

Survey site: Gartree 2, Market Harborough (Tree T2). Surveyor positions:

Date: 06/07/2021.

Sunset/sunrise: 21:27.

Start: 21:12.

End: 22:57.

Weather conditions:

Start temperature: 13 Degrees Celsius. Finish temperature: 14 Degrees Celsius.

Precipitation 0, Wind strength 0/5, Cloud cover 2/8.

Humidity start: 81%. Humidity finish: 90%.

Surveyors: Phoebe Collier (PC)

Equipment: EM Touch & I-pad/I-phone.

Survey summary: No emergences. Foraging by common pipistrelle.

Incidental observations: N/A.

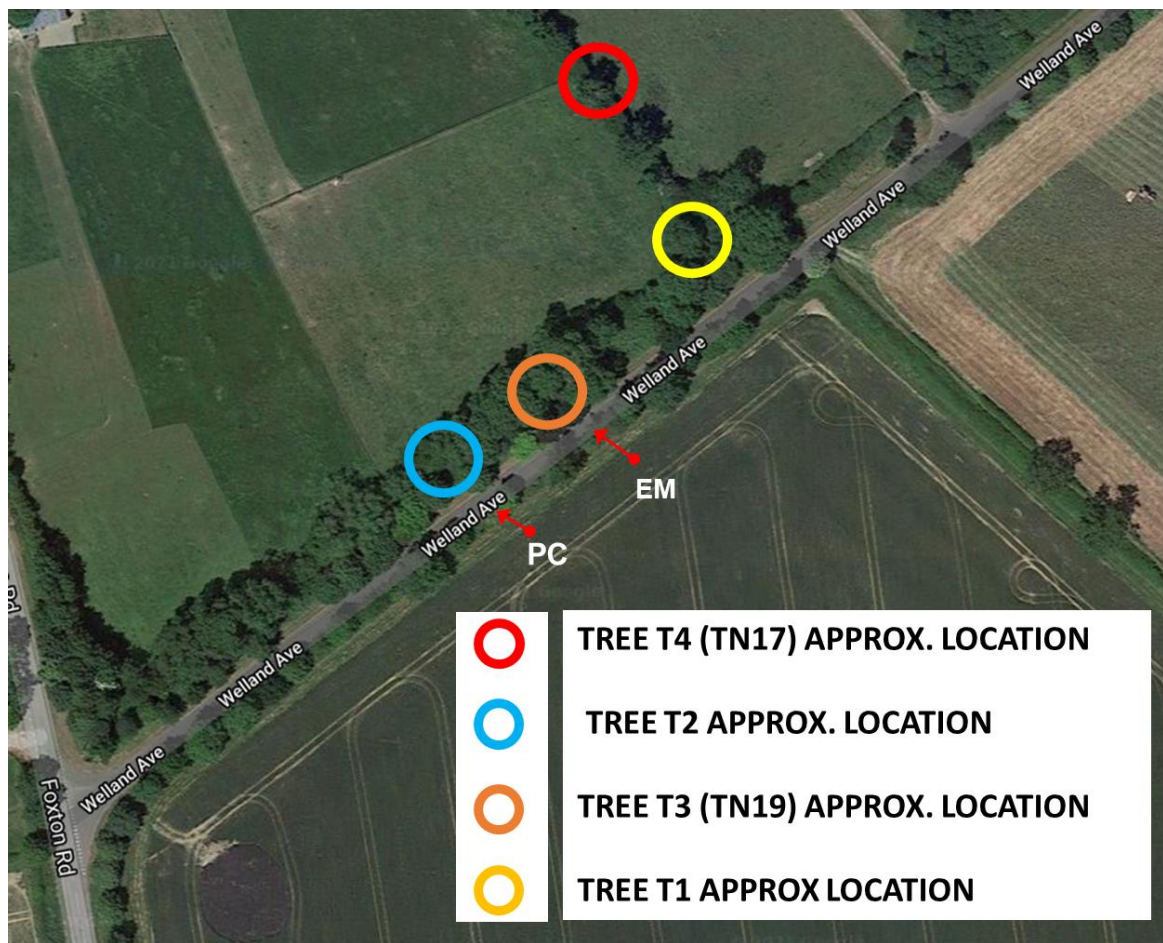
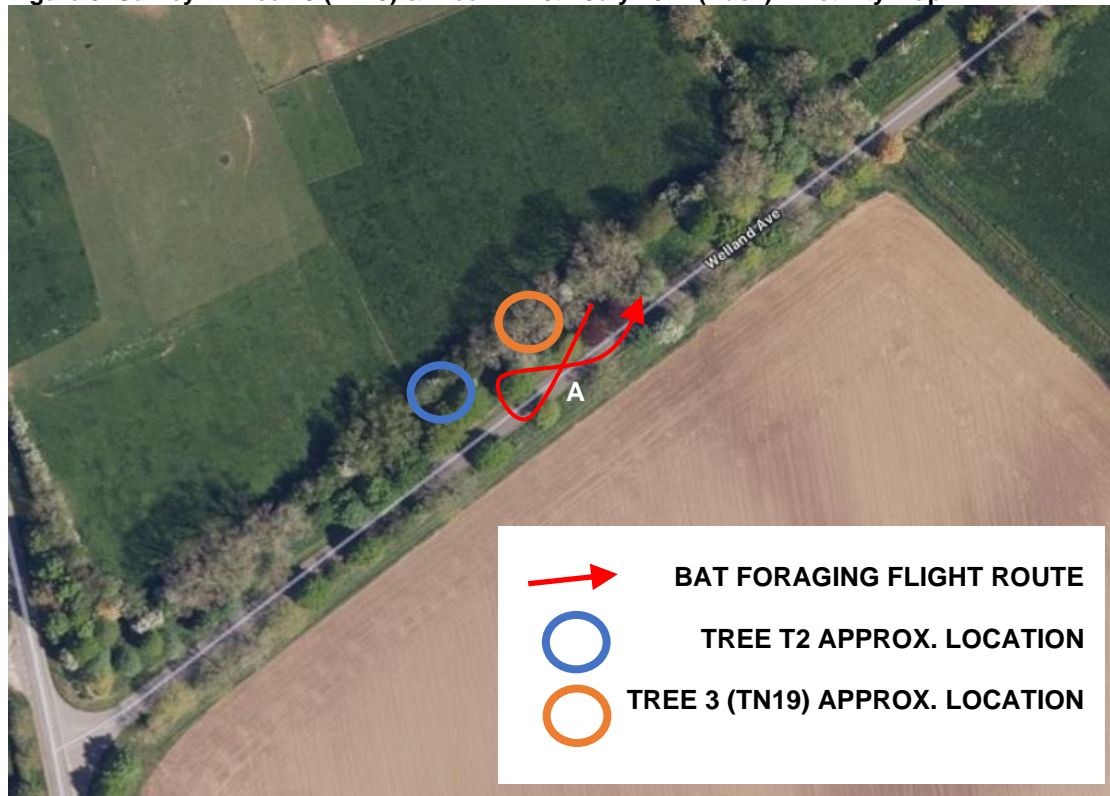
Survey constraints: Survey finished at 22:57 due to onset of high winds and showers.

Table 3 - All Bat Activity Recorded During Survey 2 Tree T2 (Dusk) 29/06/2021 Refer to Fig. 1.

Time (24 Hrs)	Surveyor ⁸	Species ⁹	No. bats	Bat Activity	Map Annotation
21:48	PC	P.pip	1	HNS - BF	
21:50	PC	P.pip	1	HNS	
21:53	PC	P.pip	1	HNS - BF	
21:48	PC	P.pip	1	HNS - BF	
22:05	PC	P.pip	1	HNS	
22:10	PC	P.pip	1	HNS	

HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); MYO – *Myotis* sp (Brandt's, whiskered, Daubenton's, Natter's, Bechstein's); BLE – Brown Long eared.

Figure 8: Survey 2: Tree T3 (TN19) & Tree T2 – 6th July 2021 (Dusk) – Activity map



Survey 2: Tree T4 (TN17) – 14th July 2021 (Dusk).

Survey site: Gartree 2, Market Harborough (Tree T4 (TN17)). Surveyor positions: Facing tree.

Date: 14/07/2021.

Sunset/sunrise: 21:13.

Start: 20:58.

End: 22:59.

Weather conditions:

Start temperature: 17°C. Finish temperature: 17°C.

Precipitation 0, Wind strength 0/5, Cloud cover 0/8.

Humidity start: 70%. Humidity finish: 70%.

Surveyors: Kinzie Watts (KW) and Ellen Marshall (EM).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Bats commuting and foraging along the tree lines in Easternly and Westerly directions, some bats commuting across the field and a few infrequent passes of *Nathusius pipistrelle* and *Serotine*.

Incidental observations: Barn owl (*Tyto alba*) emerging from adjacent Tree TN16 (Dead Tree) at 21:58.

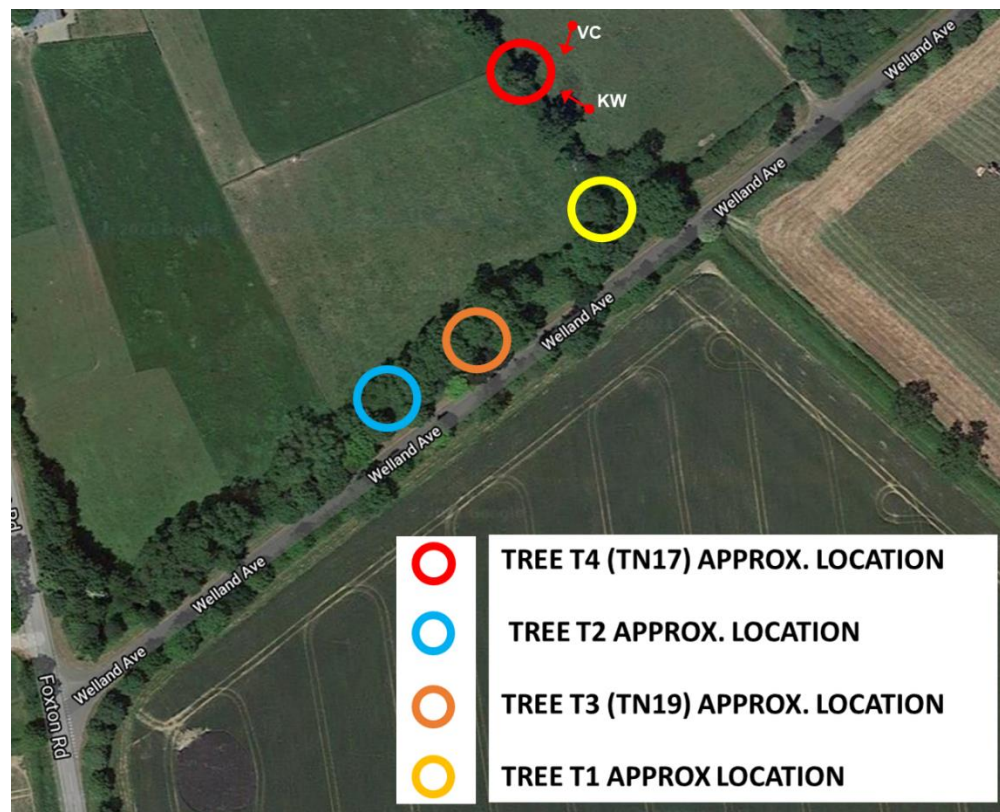
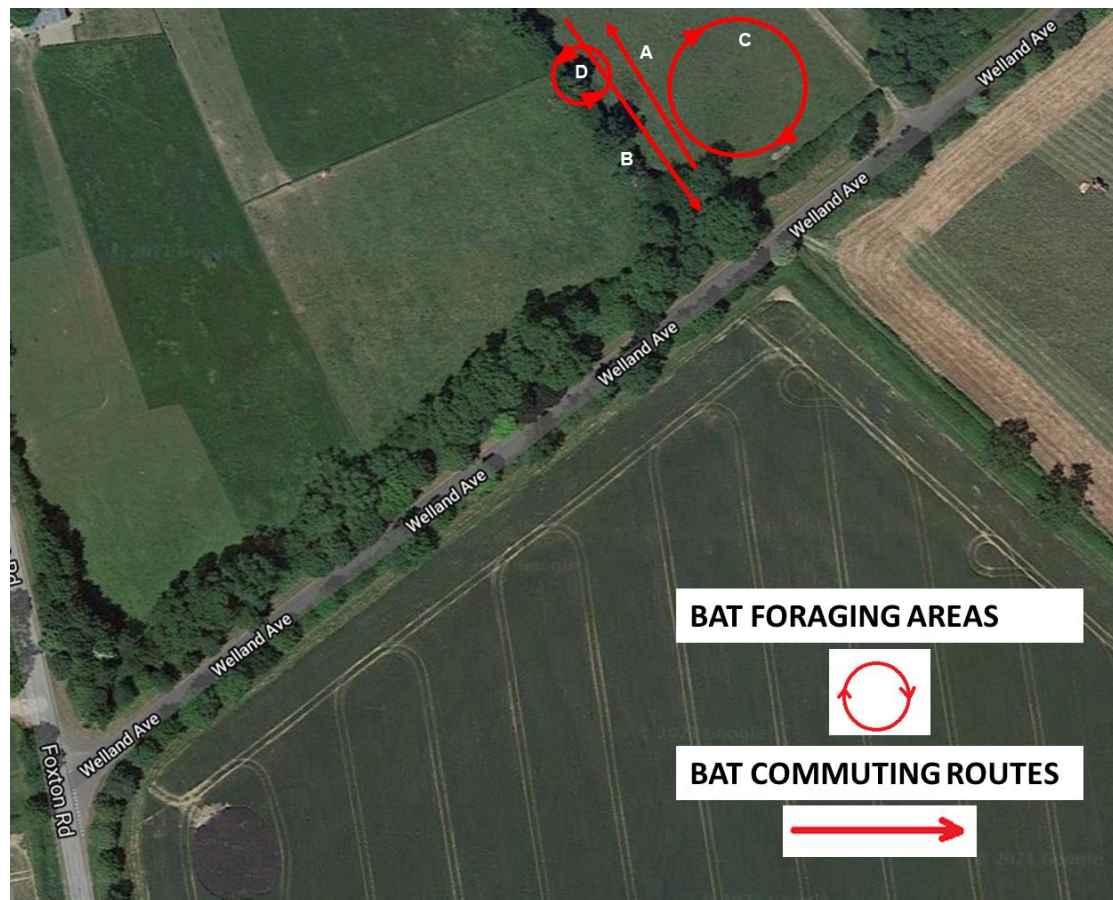
Survey constraints: N/A.

Table 9 - All Bat Activity Recorded During Survey 2 of; Tree T4 (TN17) (Dusk) 14/07/2021 Refer to Fig. 9.

Time (24 Hrs)	Surveyor	Species ¹⁰	No. bats	Bat Activity	Map Annotation
21:41	EM / KW	P.pip	1	HNS, Brief call	
21:45	EM / KW	P.pip	6	BC, BF, NWest along the tree line	A
21:56	EM / KW	P.pip	1	BC, Flew South and then headed NWest along the tree line	A
22:01	EM / KW	P.pip	1	BF, South of the tree line	
22:09	EM / KW	P.nat	1	BC, SWest to SEast along the tree line	B
22:13	EM / KW	P.pip	1	BC, SWest to SEast along the tree line then across the field	B
22:17	EM / KW	P.pip	1	BF, Circling above	D
22:19	EM / KW	Bat sp.	1	BF, Along the tree line – SNH	D
22:22	EM / KW	P.pip	1	BC, S East to S West along the tree line	A
22:24	EM / KW	P.pip	1	BF, Circling the field with occasional passes of faint calls	C
22:36	EM / KW	P.nat	1	HNS, Single pass	
22:45	EM / KW	Bat sp.	1	SNH, BC, S East to N West along the tree line	A
22:48	EM / KW	E.ser	1	HNS, Single pass	

¹⁰ P.nat – *Nathusius pipistrelle* (*Pipistrellus nathusii*); E.ser – *Serotine* (*Eptesicus serotinus*); Bat sp. – Unidentifiable bat species.

Figure 9: Survey 2: Tree T4 (TN17) – 14th July 2021 (Dusk) - Activity map.



Survey 2: Tree T1 – 21st July 2021 (Dusk).

Survey site: Gartree 2, Market Harborough (Tree T1). Surveyor positions: Facing tree.

Date: 21/07/2021.

Sunset/sunrise: 21:12.

Start: 20:57.

End: 22:42.

Weather conditions:

Start temperature: 32°C. Finish temperature: 20°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 68%. Humidity finish: 74%.

Surveyors: John Harvey (JH) & Reece Rockley (RR).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Common pipistrelles foraging and commuting down the path and around the trees throughout the night. Occasional pass of noctules which locations were assumed commuting over the fields at height.

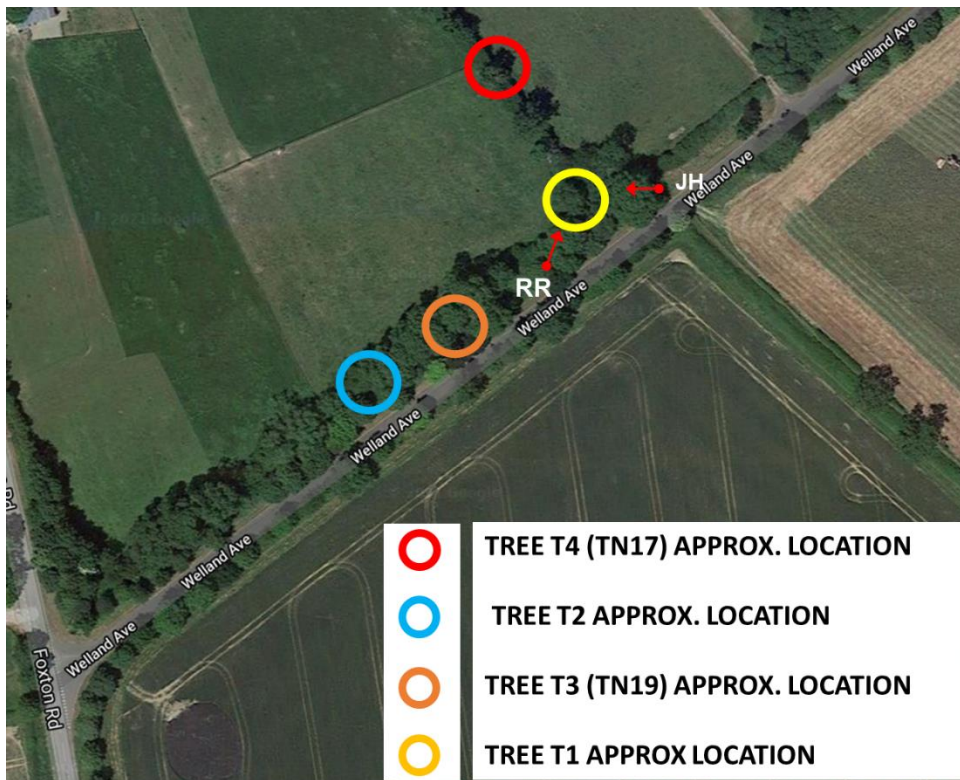
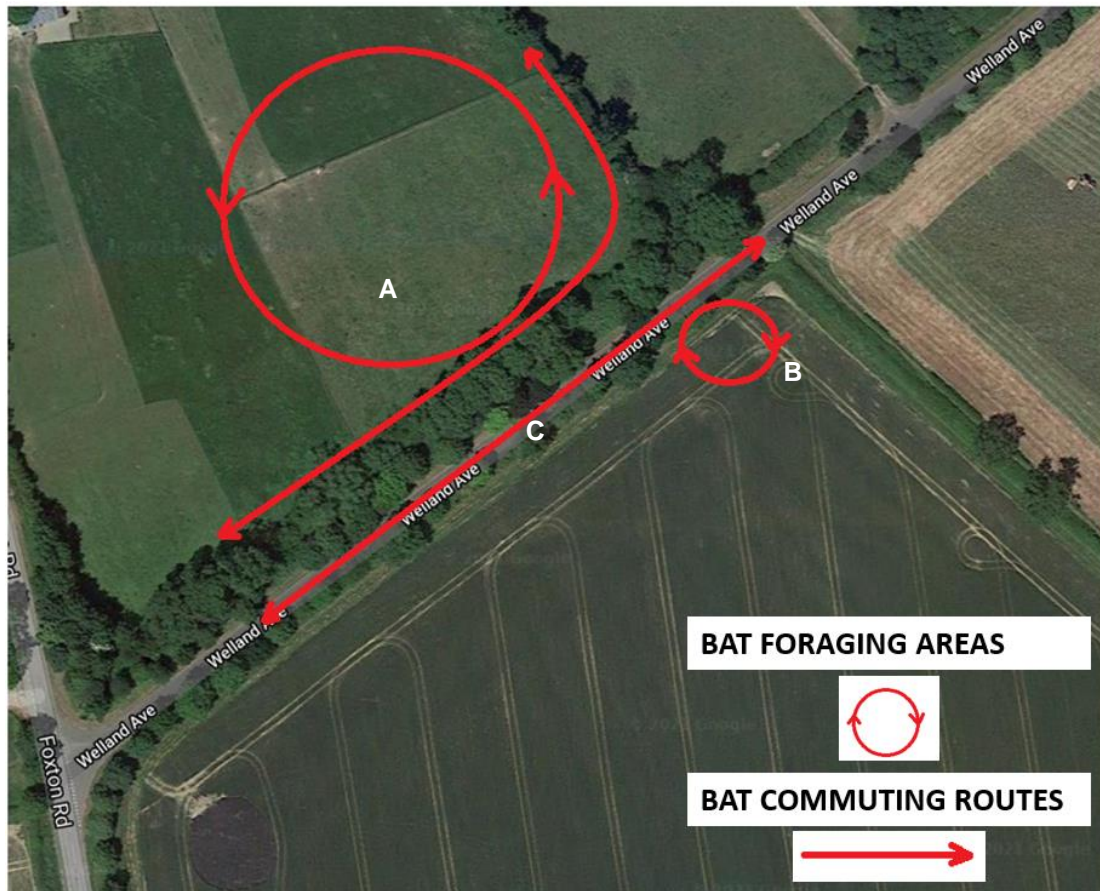
Incidental observations N/A.

Survey constraints: N/A.

Table 10 - All Bat Activity Recorded During Survey 1 of; Tree T1 on the 21/07/2021 Refer to Fig. 10.

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
21:35-22:16	JH & RR	P.pip	Unknown	HNS, Constant foraging & commuting calls from the road, tree line and field areas	C
22:03	JH & RR	N.noc	1	HNS, Loud pass	A/B
22:30	JH & RR	P.pip	1	HNS, Brief pass	
22:37	RR	N.noc	1	HNS, Loud pass	A/B
22:41	RR	P.pip	1	HNS, Brief pass	

Figure 10: Survey 2: Tree T1 - 21st July 2021(Dusk) – Activity Map.





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

Updated Phase 1 habitat survey for new prison on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire

CGO Ecology Ltd
Christchurch

18th August 2021

Authors:

Dr Chris Gleed-Owen MCIEEM, Director & Principal Ecologist

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Executive summary

Introduction

CGO Ecology Ltd (CGO) was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct an updated Phase 1 habitat survey of land adjacent to HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council. Ramboll conducted a Preliminary Ecological Appraisal (PEA) including a Phase 1 habitat survey in September 2020. Some inaccuracies in the Ramboll survey became apparent following phase 2 ecology surveys by CGO in 2021.

Methodology

An updated Phase 1 habitat survey was conducted on 5th July 2021, following standard JNCC 2010 methodology. A Geographical Information System was used to map habitats, and extract the revised habitat area figures. The habitat types were translated from Phase 1 to UKHab categories, and conditions assessed to enable use in Biodiversity Net Gain (BNG) calculations.

Results

The main habitat changes were from 'improved grassland' to 'poor semi-improved grassland' which occupies much of the site, and from 'scattered trees' to other woodland types. Two farm buildings were also added, a small area of 'continuous scrub' was converted to 'tall ruderal'. A pond was enlarged slightly, and minor adjustments were made to habitat edges, especially around hardstanding in the development area.

Discussion and conclusions

The updated Phase 1 habitat survey and conversion to UKHab has created a dataset that is accurate for use in BNG Metric 3.0. The most important change was from improved grassland to poor semi-improved grassland. This was because the grassland across the site is dominated by common bent and Yorkshire fog, and has only a minor proportion of seeded grasses and weeds indicative of improved status. It is understandable that this was not apparent in late September 2020 when originally surveyed by Ramboll. The woodland areas were incorrectly coded as scattered trees, however, including areas of plantation and seminatural broadleaved woodland, and areas of plantation mixed woodland.

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1. Introduction

CGO Ecology Ltd (CGO) was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct an updated Phase 1 habitat survey of land adjacent to HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council.

An Outline Planning Application (OPA) is proposed, with all matters reserved except for access and scale for the construction of a new Category B prison of up to 82,555m² GEA (gross external area) within a secure perimeter fence together with access parking, landscaping and associated engineering works on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire, LE16 7RP.

The indicative site layout proposes a range of buildings and facilities typical of a Category B resettlement prison, including seven new houseblocks (1,715 prisoners in total), supporting development including kitchen and other facilities, ancillary development including car parking (c.523 spaces), internal road layout, and perimeter fencing. The house blocks will be four storeys 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. MoJ's aspirations include targeting near-zero carbon operations, 10% BNG, and at least BREEAM 'Excellent' certification, with endeavours to achieving BREEAM 'Outstanding'.

Ramboll Ltd conducted a Preliminary Ecological Appraisal (PEA) including a Phase 1 habitat survey in September 2020 (Molesworth, 2020). Some inaccuracies in the Ramboll survey became apparent following phase 2 ecology surveys by CGO in 2021. This was especially in relation to the grassland composition, but also the woodland types, and other more minor discrepancies from ground-truthing.

2. Methodology

An updated Phase 1 habitat survey was conducted on 5th July 2021, following standard JNCC 2010 methodology. The existing Ramboll Phase 1 habitat plan (Molesworth, 2020) was used as a basemap, and annotated to reflect any changes observed in the field. Further changes were made iteratively subsequently.

A Geographical Information System was used to map the revised habitats, and extract the revised habitat area figures for the whole site, the areas lost, and the areas retained and/or enhanced.

The habitat types were translated from Phase 1 to UKHab categories, and conditions assessed using Natural England (2021) to enable use in Biodiversity Net Gain (BNG) calculations.

3. Results

3.1. Overview

The main habitat changes were from 'improved grassland' to 'poor semi-improved grassland' which occupies much of the site, and from 'scattered trees' to other woodland types. Two farm buildings were also added, a small area of 'continuous scrub' was converted to 'tall ruderal'. A pond was enlarged slightly, and minor adjustments were made to habitat edges, especially around hardstanding in the development area.

Phase 1 habitat type	Area (ha)
Amenity grassland	0.45
Broad-leaved plantation woodland	0.47
Broadleaved semi-natural woodland	0.86
Building	0.04
Dense scrub	0.47
Hardstanding	1.68
Mixed plantation woodland	0.08
Poor semi-improved grassland	23.41
Scattered scrub	0.16
Standing Water	0.02
Tall ruderal	0.45
Total area	28.09

Table 1 – Phase 1 habitats in the whole application area (red line boundary).

Phase 1 habitat type	Total area (ha)
Amenity grassland	0.27
Broad-leaved plantation woodland	0.18
Broadleaved semi-natural woodland	0.31
Building	0.04
Hardstanding	1.41
Poor semi-improved grassland	0.14
Standing water	18.85
Tall ruderal	0.02
Total area	21.62

Table 2 - Phase 1 habitats that will be lost to the prison development.

Phase 1 habitat type	Area (ha)
Amenity grassland	0.18
Broad-leaved plantation woodland	0.55
Broadleaved semi-natural woodland	0.47
Dense scrub	0.27
Hardstanding	0.23
Mixed plantation woodland	4.56
Poor semi-improved grassland	0.16
Scattered scrub	0.05
Tall ruderal	0.18
Total area	6.47

Table 3 - Phase 1 habitats that will be retained, including those that will be enhanced.

3.2. Amenity grassland

This Phase 1 habitat is represented by seeded and regularly-mown grassland areas around the fringes of the existing prison. 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. Broad-leaved plantation woodland

A line of trees running through the development area is primarily composed of hybrid black poplar (*Populus x canadensis*), with a few native trees. A similar band of plantation woodland

also surrounds the MoJ maintenance buildings to the north of Welland Avenue. The UKHab conversion is w1g Other woodland; broadleaved. Metric 3.0 condition is 'fairly poor' as it fails at least four the condition assessment criteria (Natural England, 2021).

3.4. Broad-leaved semi-natural woodland

Seminatural broadleaved woodland within the development area is confined to small areas of trees comprising white willow (*Salix alba*), grey willow (*Salix cinerea*), hawthorn (*Crataegus monogyna*), wild cherry (*Prunus avium*), and other natives. To the north of Welland Avenue (within the red line, but retained) and further west along Welland Avenue (outside the red line, but within MoJ ownership) are willows, ash, sycamore (*Acer pseudoplatanus*), pedunculate oak (*Quercus robur*), apple (*Malus pumila*), plum (*Prunus domestica*), hawthorn, wild cherry, and others.

The UKHab conversion is w1g Other woodland; broadleaved. Metric 3.0 condition is 'fairly poor' as it fails at least four the condition assessment criteria (Natural England, 2021).

3.5. Building

Within the red line are three farm buildings which will be lost: a modern breeze-block metal-roofed barn, a World War II-era brick-ended barn with a curved concrete roof, and a small brick-built shed. The UKHab conversion is u1b Developed land; sealed surface.

3.6. Dense/continuous scrub

There are small areas of dense and scattered scrub around the site, comprising bramble (*Rubus fruticosus* agg.) and other native woody species. The UKHab conversion is h3h Mixed scrub.

3.7. Hardstanding

These are areas of asphalt, concrete, gravel or other sealed surface, mainly originating from the World War II airfield, but also the perimeter of the existing prison, and the road surface of Welland Avenue. The UKHab conversion is u1b Developed land; sealed surface.

3.8. Mixed plantation woodland

Along the northwest edge of the development is a line of Lombardy black poplar (*Populus nigra nigra* 'Italica' cultivar) and Leyland cypress (*Cupressus leylandii*). Another area of mixed plantation trees lies adjacent to the maintenance compound north of Welland Avenue. The UKHab conversion is w1h Other woodland; mixed. The Metric 3.0 condition is 'poor', as the trees are non-native species (Natural England, 2021).

3.9. Poor semi-improved grassland

As defined by Phase 1 (JNCC, 2010), this covers the agriculturally-improved grasslands with poor species diversity, but not dominated by seeded species such as perennial rye-grass (*Lolium perenne*) and of undesirable 'weeds' such as thistles, docks, and white clover (*Trifolium repens*) that would classify it as 'improved grassland'. This grassland was mapped as 'improved grassland' by Ramboll (Molesworth, 2020), but resurvey by CGO showed that all fields had tall sward dominated by common bent (*Agrostis capillaris*) and Yorkshire fog (*Holcus lanatus*), with never more than 20-30% of perennial rye-grass, and only patchy weed coverage.

Some areas have good local coverage of red clover (*Trifolium pratense*) and desirable tall herbs such as common knapweed (*Centaurea nigra*) which veer towards a more seminatural category.

All the grassland fields on site are used as pasture, grazed rotationally by sheep (*Ovis aries*), but there is no evidence of reseeded. Thus, the correct Phase 1 habitat is concluded to be 'poor semi-improved grassland' rather than 'improved grassland'.

The UKHab conversion is g4 Modified grassland. To reflect the difference between Phase 1 poor semi-improved grassland and improved grassland, its condition is described in the BNG Metric 3.0 as 'fairly poor' (as opposed to 'poor' for improved grassland).

3.10. Scattered scrub

A patch of scattered scrub adjacent to Welland Avenue is largely bramble, with coarse tall herbs, rank grass, and garden escapes. The best UKHab conversion is h3h Mixed scrub, as there is not direct translation for scattered scrub.

3.11. Standing water

One pond is within in the red line boundary, a small agricultural pond surrounded by hawthorn. Its water quality is poor, with little submerged aquatic plant growth, and shallow water. This is referred to as P1 in the GCN surveys. Several ditches will be lost to the new prison, which are seasonally wet but do not constitute watercourses. The UKHAB correspondence is r1a6 Other eutrophic standing waters.

3.12. Tall ruderal

Patches of nettle (*Urtica dioica*), fat-hen (*Chenopodium album*), redshank (*Persicaria maculosa*) and other agricultural weeds exist around the farm. There are also patches of these on manure piles along the main taxiway hardstanding in the development area. However, they are not mapped, because the primary habitat is hardstanding. There is no satisfactory UKHab correspondence.

3.13. Intact native species-poor hedgerow

Intact hedgerow in the farmland comprises mainly of hawthorn, with other natives such as elder (*Sambucus nigra*) and dog rose (*Rosa canina*). All 338m will be retained, and some will be extended by new planting. UKHab correspondence is h2b Other hedgerows.

3.14. Defunct species-poor hedgerow

Defunct sections of hawthorn-dominated hedgerow comes to around 332m in length. UKHab correspondence is h2b Other hedgerows.

3.15. Wet ditch

Within the development area is 393m of wet ditch, all of which will be lost. The ditches do not have notable species composition or diversity, and the water in them is a shallow trickle. None of them is significant enough to be classified as a watercourse in Phase 1 or UKHab terms (e.g. for BNG or BREEAM calculations). There is no UKHab primary habitat translation.

3.16. Dry ditch

Of a total of 427m of dry ditch on site, 251m will be lost to the development. There is no UKHab primary habitat translation.

4. Discussion and conclusions

The updated Phase 1 habitat survey and conversion to UKHab has created a dataset that is accurate for use in BNG Metric 3.0. The most important change was from improved grassland to poor semi-improved grassland. This was because the grassland across the site is dominated by common bent and Yorkshire fog, and has only a minor proportion of seeded grasses and weeds indicative of improved status. It is understandable that this was not apparent in late September 2020 when originally surveyed by Ramboll. The woodland areas were incorrectly coded as scattered trees, however, including areas of plantation and seminatural broadleaved woodland, and areas of plantation mixed woodland.

5. References

Joint Nature Conservation Committee (JNCC) (2010) *Handbook for Phase 1 habitat survey - A technique for environmental audit*. JNCC, Peterborough.

Molesworth, J. (2020) *Raven. Preliminary Ecological Appraisal*. Ramboll, Exeter.

Natural England (2021) *The Biodiversity Metric 3.0 auditing and accounting for biodiversity - TECHNICAL SUPPLEMENT*. Natural England Joint Publication JP039. Natural England, York.

6. Appendices

Appendix 1 - Photographs

Appendix 2 - Gartree 2 updated Phase 1 habitat plan

Appendix 1 – Photographs



Plate 1- Detail of common-bent-dominated sward.



Plate 2 – West part of development area.



Plate 3 – West part of development area.



Plate 4 – Field northwest of Welland Avenue.



Plate 5 – Field northwest of Welland Avenue.



Plate 6 – Field northwest of Welland Avenue.



Plate 7 - Red clover, northwest of Welland Avenue.



Plate 8 – East end of development area.



Plate 9 – Southeast of development area.



Plate 10 – Southeast of development area.



Plate 11 – South of development area.



Plate 12 – Southwest of development area.



Plate 13 – Woodland beside Welland Avenue (not scattered trees).



Plate 14 – Woodland in east part of development area (not scattered trees).

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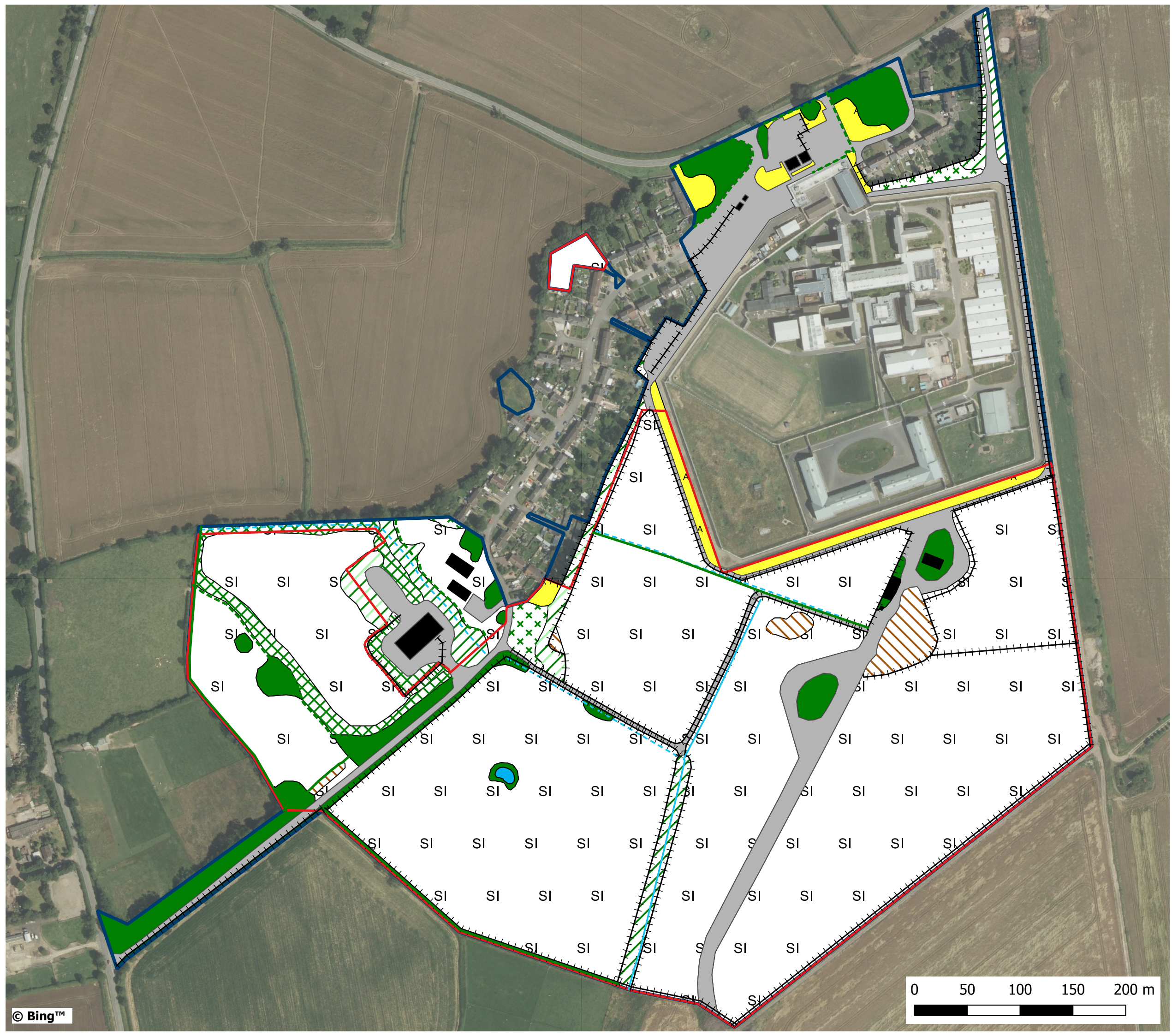
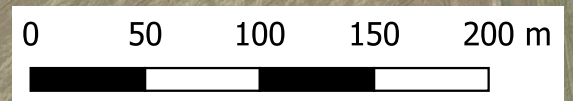
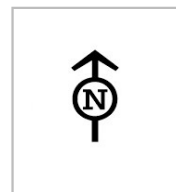
Legend

- Application red line boundary
- MoJ ownership boundary
- Habitats**
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A1.3.2 - Mixed woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- J1.2 - Amenity grassland
- J3.6 - Buildings
- G1 - Standing water
- Hardstanding
- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.6 - Dry ditch
- Wet ditch



Draw Date:
18/08/2021

Scale:
1:3300 (@A3)





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Barn owl survey for new prison on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire

CGO Ecology Ltd
Christchurch

27th August 2021

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Checked by:	Rebecca Perl BA MA	
Approved by:	Dr Chris Gleed-Owen BSc (Hons) PhD MCIEEM	

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

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Version	Date	Summary of changes
1	27/08/2021	n/a

Non-technical summary

Introduction

CGO Ecology Ltd (CGO) was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a barn owl survey on land adjacent to HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council.

Methodology

CGO and its subconsultant Brindle & Green Ltd (B&G) undertook daytime walkovers to search for barn owl roosts/nests, and dusk and dawn surveys to identify roost use and foraging activity, within a Zone of Influence (Zol) assumed to be a 100m buffer around the development site and Welland Avenue access road. A Preliminary Ecological Appraisal (PEA) by Ramboll Ltd identified roosts in two trees northwest of Welland Avenue. The surveys were led by Amy Trewick BSc (Hons) (CL29-license number 00456) and Chris Gleed-Owen, assisted by other suitably-experienced ecologists.

Results

A single barn owl emergence was observed in a tree identified previously by Ramboll (TN16) as containing a roost, outside the development area, but within the Zol. No other barn owl activity was observed. No roosts or nest sites were identified in buildings or trees within the development area, and no foraging was observed over the development area. Barn owl activity within the Zol is limited, and appears to be restricted to areas northwest of Welland Avenue. No evidence of breeding was observed, and the maximum count was one barn owl.

Conclusions, mitigation, enhancement recommendations

No barn owl roosts or nest sites, and no foraging activity, were identified on the development site. Three tree roosts are present within the Zol northwest of Welland Avenue, of which at least one is in use. Any roosts in trees are potential nest sites, but no nesting activity has been observed within the Zol.

Mitigation measures will include a sensitive lighting plan, with no new nocturnal lighting on Welland Avenue. If works take place during the April-June breeding season, a barn owl check must take place immediately beforehand. Any active nest must be avoided with at least a 30m standoff until any chicks have fledged.

As enhancements, two barn owl nestboxes will be installed. The first will be in a tree to the northwest of Welland Avenue, where grassland restoration will increase the area's carrying capacity for small mammals, and therefore for barn owls which prey upon them. A second nestbox will be installed in a tree on the southern perimeter of the development, to encourage the use of land to the southeast of Welland Avenue, and potentially develop a new territory.

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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, to conduct a barn owl (*Tyto alba*) survey of land adjacent to HMP Gartree, Market Harborough, Leicestershire (Figure 1). The Ministry of Justice proposes a development as part of its New Prisons Programme on land centred on (SP 7052 8873) (Figure 2). The Local Planning Authority (LPA) is Harborough District Council.

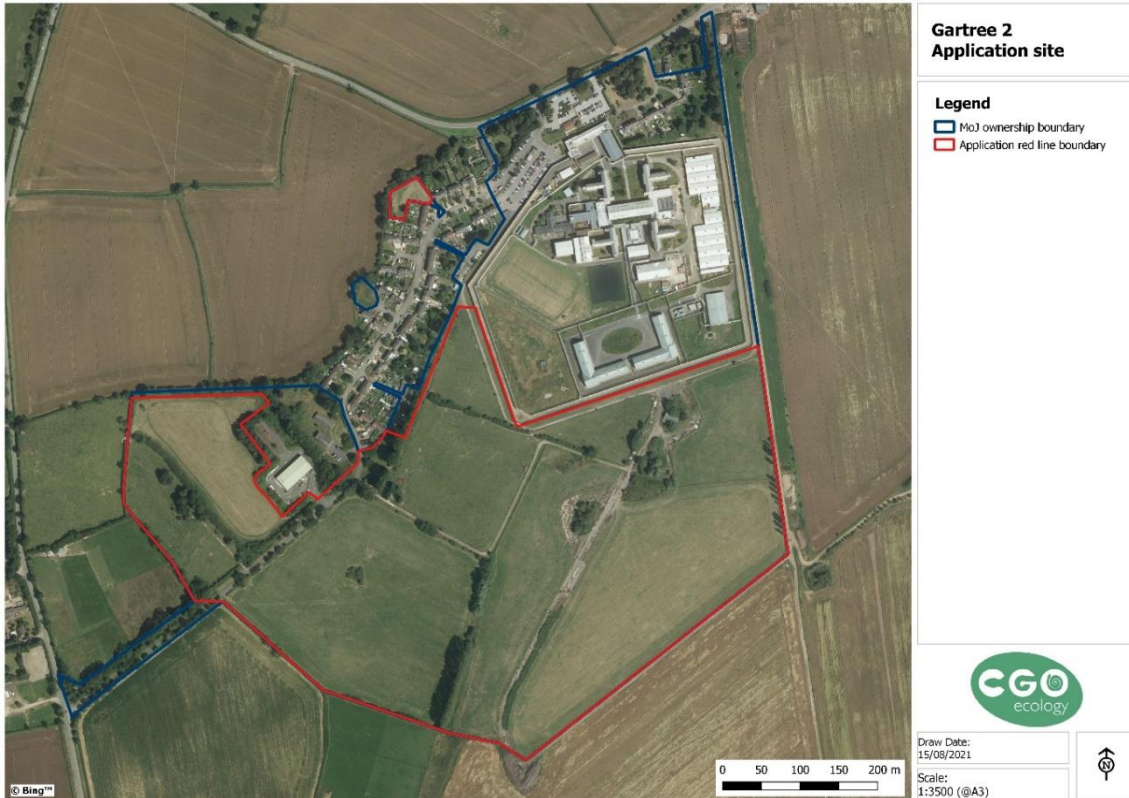


Figure 1 – Proposed development (red line), and MoJ ownership boundary (blue line).



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

1.2. Legal protection

Barn owls and their nests and eggs are protected by the Wildlife and Countryside Act 1981 (as amended). Barn owls may roost and/or nest in agricultural buildings, trees and other natural cavities. They forage over grassland, primarily at dusk and dawn, where they hunt small mammals such as field voles (*Microtus agrestis*).

1.3. Authors, surveyors

Lead author Dr Chris Gleed-Owen MCIEEM is Director and Principal Ecologist of CGO, project manager for the Gartree 2 phase 2 ecological surveys. He conducted daytime walkovers in February, March, April, and July, and a targeted dusk survey on 5th July 2021.

Amy Trewick ACIEEM (Natural England CL29 barn owl licence), formerly of Brindle & Green Ltd (B&G), is co-author of this report. She conducted the preliminary assessments of trees and buildings for barn owl roosts, and many nocturnal and daytime surveys.

B&G was commissioned to carry out most of the phase 2 ecology surveys as subconsultant to CGO. These were led by Amy Trewick initially, and then by Ellen Marshall, Adrian Cox, and John Harvey, assisted by Kinzie Watts, Veronica Cantero Sanchez, Kerry Baker, Phoebe Collier, and Reece Rockley.

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

1.4. Site context

The development site is land to the south of HMP Gartree, used primarily to graze sheep (*Ovis aries*). It comprises fields of poor semi-improved grassland, with hedgerows and lines of trees. The red line includes a wider area to the northwest of Welland Avenue, set aside for Biodiversity Net Gain (BNG) habitat enhancements.

The wider landscape in which HMP Gartree is situated is rural, with arable and pasture farming. It is primarily open in nature, with scattered residential properties and pockets of woodland. Hedgerows and treelines create interconnecting ecological corridors throughout the area. Within 1km to the southeast, a large new residential development at Airfield Farm is expanding the urban area of the town of Market Harborough.

1.5. Proposed works

An Outline Planning Application (OPA) is proposed, with all matters reserved except for access and scale for the construction of a new Category B prison of up to 82,555m² GEA (gross external area) within a secure perimeter fence together with access parking, landscaping, and associated engineering works on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire, LE16 7RP.

The indicative site layout proposes a range of buildings and facilities typical of a Category B resettlement prison, including seven new houseblocks (1,715 prisoners in total), supporting development including kitchen and other facilities, ancillary development including car parking (c.523 spaces), internal road layout, and perimeter fencing. The house blocks will be four storeys 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. MoJ's aspirations include targeting near-zero carbon operations, 10% BNG, and at least BREEAM 'Excellent' certification, with endeavours to achieving BREEAM 'Outstanding'.

2. Methodology

2.1. Desk study

A Preliminary Ecological Appraisal (PEA) conducted by Ramboll (Molesworth, 2020), including a Leicestershire and Rutland Environment Records Centre (LRERC) 2km search. This guided Mace's instruction of phase 2 ecological surveys.

CGO was instructed in December 2020, with a barn owl survey to be conducted in 2021. An updated LRERC search was sought by CGO in July 2021. The Defra MAGIC website was also queried (<https://magic.defra.gov.uk/MagicMap.aspx>).

2.2. Walkover surveys

CGO and B&G conducted daytime building and tree inspections and site walkovers targeting barn owl evidence in February, March, and July 2021. The Zone of Influence (Zol) is considered to be the site and a buffer up to 100m wide where significant disturbance through construction activity is occurring. Incidental data was also gathered during daytime walkover surveys for badger and reptiles in April and May 2021. General methodology followed Shawyer (2011), adapted to fit the site and information gathered during PEA and phase 2 surveys. All observations used binoculars without disturbance to barn owls.

Ellen Marshall MRes (Natural England CL29 barn owl licence) and Amy Trewick ACIEEM (Natural England CL29 barn owl licence) assessed trees and buildings identified by Ramboll's as having barn owl roosts and/or potential. Amy also conducted daytime walkovers for badger (*Meles meles*) and reptiles. Significant daytime survey effort targeting reptiles (seven days) and badgers (21 days) was thereby applied to barn owl roost and activity detection.

2.3. Dusk and dawn surveys

A targeted barn owl dusk survey was conducted on 5th July 2021 by Chris Gleed-Owen. Dusk surveys of two trees (T3 and T4) with previous barn owl evidence (Molesworth, 2020) were also conducted by B&G, led by Ellen Marshall (CL29-licensed). Nocturnal survey effort applied for other species/groups was an important survey effort for barn owl. This included six nights of GCN survey, 18 dusk and dawn bat roost surveys, and four evenings of bat activity survey.

2.4. Limitations

There were no significant constraints on the surveys. The geographical spread of survey effort covered the entire site over many days and nights. The surveys covered a period of six months and three seasons, with no disturbance to barn owls, roosts, or nest sites.

3. Baseline ecological conditions

Ramboll (Molesworth, 2020) found barn owl pellets showing that two trees northwest of Welland Avenue are current or old barn owl roosts, both lying within the Zol. These are referred to in CGO reports as T3 and T4, and by Ramboll as target notes TN19 and TN17 respectively.

The LRERC (2021) 2km search returned three records of barn owl from nearby villages of Lubenham and Foxton from 2010-2019. Building inspections and walkovers did not yield any further roost or nest site evidence.

During the 2021 walkovers, dusk and dawn surveys, no additional evidence of barn owl was found, such as pellets or feathers. No nests were identified. However, a barn owl was seen on only one occasion. It emerged from a roost in tree T5, referred to as TN16 in Ramboll's PEA (Molesworth, 2020), inside the Zol, on the evening of 14th July 2021 during a targeted dusk survey. Location of barn owl roosts are shown in figure 3.

The lack of other observations is despite numerous nocturnal bat and GCN surveys between March-July, which provided significant opportunity to observe foraging and roosting barn owls. It is likely that the barn owl(s) using T3 (TN19), T4 (TN17) and T5 (TN16), do not forage over the development site, and instead forage over fields to the northwest of Welland Avenue.

Barn owls prefer a longer-sward grassland with a well-developed litter layer than supports a larger population of small mammals such as field vole. The fields southeast of Welland Avenue on the proposed new prison site are typically more intensively-grazed, and lack the ‘thatch’ that the fields northwest of Welland Avenue have. The well-developed scrub edges of the fields northwest of Welland Avenue also testify to the lower-intensity management regime applied there.

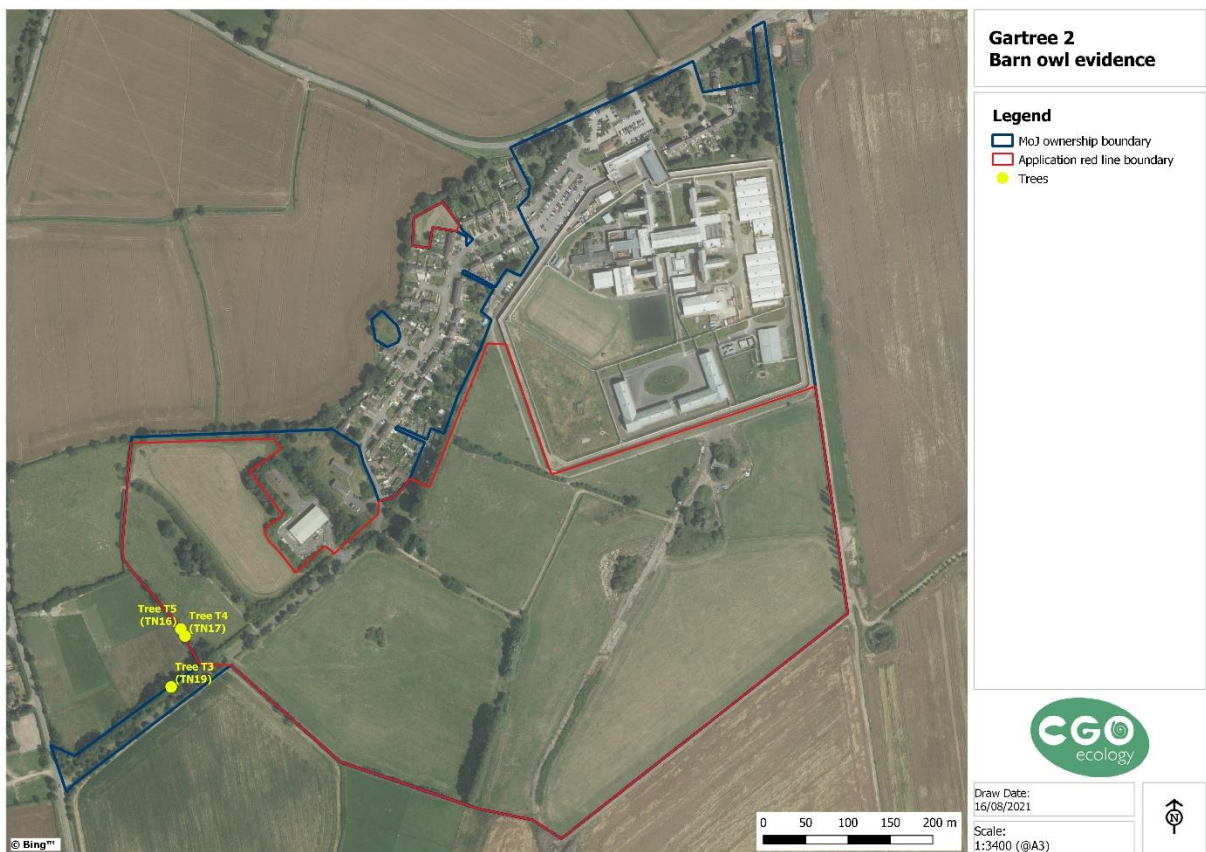


Figure 3 – Barn owl roost evidence.

4. Impact assessment

No barn owl roosts or nest sites were identified within the development area, and therefore nesting/roosting barn owls will not be lost to the development. Barn owl roosts are present within the ZOL to the northwest of Welland Avenue, however, and could be impacted by construction activities and/or operational effects. Construction could cause an increase in noise, lighting, and other effects along Welland Avenue, which might impact barn owl foraging areas.

5. Mitigation

Permanent lighting must be avoided on Welland Avenue, and a sensitive lighting plan be used during construction. Any temporary nocturnal lighting along Welland Avenue must avoid areas near the known barn owl roost, and must not shed light beyond the tree-line on the northwest side of Welland Avenue. No loss of roosts, nest sites or foraging habitat will occur, therefore no habitat mitigation is necessary.

Nest checks of trees with known barn owl roosts and roost potential within the ZOI must be undertaken immediately before development if it occurs during the April-June breeding season. Note that barn owls can breed as early as March, and as late as August, and have been known to nest at any time of year. If any nest is identified, works must avoid that area, or be minimised to a non-disturbing level. This will be at the discretion of an ecologist. Normally, at least a 30m stand-off must be imposed around an active nest.

6. Residual effects, enhancements

As enhancements, two barn owl nestboxes will be installed. The first will be in a tree to the northwest of Welland Avenue, where grassland restoration will increase the area's carrying capacity for small mammals, and therefore for barn owls which prey upon them. A second nestbox will be installed in a tree on the southern perimeter of the development, to encourage the use of land to the southeast of Welland Avenue, and potentially develop a new territory.

7. References

CIEEM (2017) *Guidelines for Ecological Report Writing*. Chartered Institute of Ecology and Environmental Management, Winchester.

LRERC (2021) *LRERC Environmental Information Search (CONFIDENTIAL VERSION)*. Leicestershire and Rutland Environment Records Centre, Leicester.

Molesworth, J. (2020) *Raven. Preliminary Ecological Appraisal*. Ramboll, Exeter.

Shawyer, C. (2011) *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment Developing Best Practice in Survey and Reporting*. Wildlife Conservation Partnership, Wheathampstead.