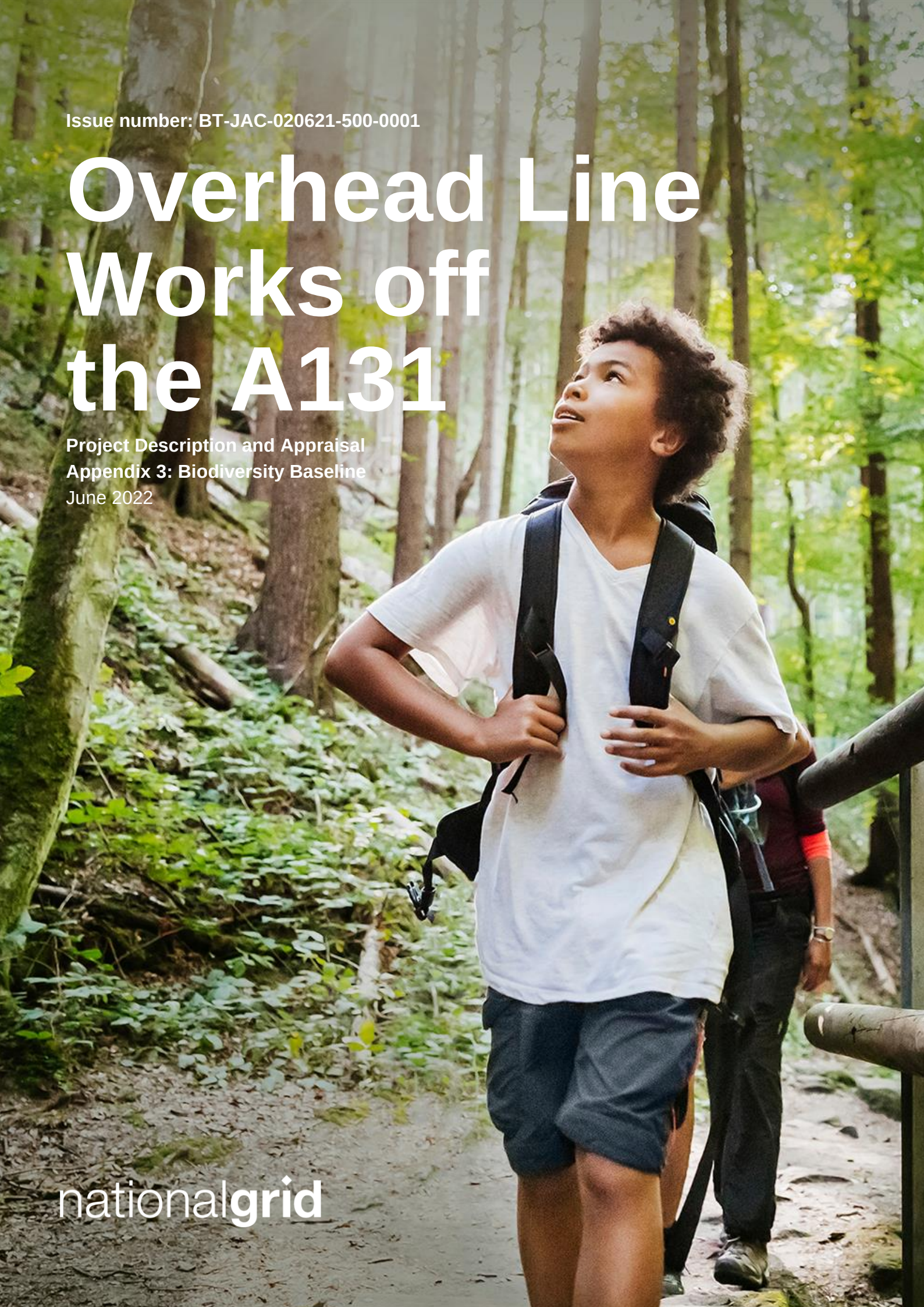


Issue number: BT-JAC-020621-500-0001

# Overhead Line Works off the A131

**Project Description and Appraisal**
**Appendix 3: Biodiversity Baseline**
June 2022

nationalgrid

*Page left intentionally blank*

## Contents

# Appendix 3: Biodiversity Baseline

## 1. Introduction

### 1.1 Purpose of this Document

1.1.1 This appendix sets out the biodiversity baseline relevant to the overhead line works. This appendix sets out the desk study, field survey methodology and results to provide a baseline of biodiversity information.

1.1.2 Specifically, it reports on:

- UK Habitat Classification (UKHab) survey with habitat condition assessment;
- Hedgerow survey;
- Invasive Non-Native Species (INNS);
- Bat surveys comprising preliminary ground level roost assessment (PGLRA) and subsequent aerial inspection through tree climbing and dusk emergence/dawn re-entry surveys;
- Great crested newt (GCN) (*Triturus cristatus*) Habitat Suitability Index (HSI) assessment and environmental DNA (eDNA) surveys; and
- Badger survey.

1.1.3 This appendix contained only baseline data. Any assessment of potential impacts on protected, priority and notable habitats and species, and recommendations on how these may be managed are discussed in the main Environmental Report. The appendix is supported by:

- Annex 1 – Figures, which illustrates results of the desk study and site surveys;
- Annex 2 - Plant Species and Abundance;
- Annex 3 – Habitat Condition Assessments;
- Annex 4 – Bat Survey Results; and
- Annex 5 - Photos of Habitats and Ecological Features.

### 1.2 Legislation

1.2.1 Legislation applicable to biodiversity is broadly split into two key types:

- strict protection of sites or species; and
- duties on all public bodies including local authorities, National Park Authorities and Natural England.

1.2.2 UK and English legislation relating to biodiversity, specific to the overhead line works, includes:

- The Environment Act 2021;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Hedgerow Regulations 1997; and

- Natural Environment and Rural Communities (NERC) Act (2006).

# 2. Methodology

## 2.1 Desk Study

2.1.1 A desk study was undertaken to gather ecological information from publicly available and third-party sources. Information was gathered about the following ecological features:

- Statutory and non-statutory designated sites (site plus 30km to identify Special Areas of Conservation (SAC) where bats are a qualifying feature and 2km for all other European sites, Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) and locally designated sites or where there is a hydrological connection between the site and a designated site);
- Protected and notable species (site plus 1km);
- Habitats of principal importance i.e. 'priority habitats' and ancient woodland (site plus 1km); and
- Invasive non-native species (site plus 1km).

2.1.2 Sources of information used were:

- Descriptions of statutory designated sites were obtained from the Natural England website (Natural England, 2021);
- Records of protected and notable species, including non-native invasive plant species were collated from the local Biological Records Centres (Suffolk Biodiversity Information Service (SBIS), Essex Wildlife Trust Biological Record Centre (EWTBRC), North East Essex Badger Group, and The Essex Field Club). SBIS and EWTBRC also provided descriptions and citations for non-statutory designated sites (Local Wildlife Sites (LoWS) in Essex);
- Ecological surveys undertaken by The Environment Partnership (TEP) and Suffolk Wildlife Trust between 2010 and 2012 for the wider reinforcement project prior to project pause (unpublished), comprising habitats, bats, badger, breeding birds, hedgerow, GCN, and dormouse;
- Historic records of ancient, veteran and notable trees were collated from the Woodland Trust's Ancient Tree Inventory (Woodland Trust, 2021);
- The Forestry Commission's National Forest Inventory provided accurate boundaries for woodland habitats;
- The Multi-Agency Geographic Information for the Countryside (MAGIC) website was reviewed to identify the locations of any statutory designated sites, Natural England's Ancient Woodland Inventory sites and Natural England's Priority Habitats Inventory sites – Habitats of Principal Importance;
- MAGIC was also used to search for European Protected Species Licences, Natural England pond surveys results (2017-2019) for District Level Licencing (DLL) and GCN Risk Zones relating to GCN occurrence and the level of impact development is likely to have on this species;
- Ordnance Survey data layers were used to provide accurate mapping of roads, rivers and waterbodies; and

- Pre-existing aerial imagery was assessed from the ESRI World Imagery dataset.

## 2.2 Survey Area

2.2.1 The overhead line works are located in a predominantly rural landscape comprising arable farmland, surrounded by parcels of ancient woodland, the A131 and small rural roads.

2.2.2 The survey area is shown on Figure A3.1 in Annex 1 of this Appendix. To support the baseline information that will be submitted to support an application pursuant to Section 37 of the Electricity Act 1989 to the Department for Business, Energy and Industrial Strategy (BEIS) for some of the accompanying works described in Section 2 of the Environmental Report, the survey area is based on the on the proposed GSP substation location (i.e. 'the site'), the 400kV temporary overhead line diversion, the underground cables and the 132kV cable sealing end platform pylon. An additional 50m to 250m buffer was applied to the site and these accompanying works, depending on the biodiversity feature. The survey areas for the various types of biodiversity survey are detailed in Table 2.1.

**Table 2.1: Defined survey areas for biodiversity field survey undertaken**

| Biodiversity Field Survey | Defined Survey Area |
|---|---|
| UKHab classification, INNS | The site, the 400kV temporary overhead line diversion, the underground cables, the 132kV cable sealing end platform pylon and a 50m buffer. |
| 'Important' Hedgerow Survey | Hedgerows directly affected by the site, the 400kV temporary overhead line diversion, the underground cables, the 132kV cable sealing end platform pylon. |
| GCN HSI and eDNA | Water bodies within 250m of the site, the 400kV temporary overhead line diversion, the underground cables or the 132kV cable sealing end platform pylon. |
| Badger survey | The site, the 400kV temporary overhead line diversion, the underground cables, the 132kV cable sealing end platform pylon and a 50m buffer. |
| Bat surveys | The site, the 400kV temporary overhead line diversion, the underground cables, the 132kV cable sealing end platform pylon and a 50m buffer. |

## 2.3 Survey guidance

2.3.1 The following guidance has been considered:

- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);
- The UK Habitat Classification User Manual Version 1.1 (Butcher *et al*., 2020);
- Defra Biodiversity Metric 2.0; Technical Supplement, Part 1 (Crosher *et al*., 2019);
- Defra Biodiversity Metric 3.0; Technical Supplement, Part 1 (Panks *et al*., 2021);
- Hedgerow Survey Handbook (Defra, 2007);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016); and
- Evaluation of the Suitability of Habitat for the Great Crested Newt (Oldham *et al.,* 2000).

## 2.4 Survey Dates

2.4.1 Table 2.2 lists the dates that field surveys were undertaken in 2021 and 2022. Surveys were undertaken as and when land access allowed, and within the appropriate survey season for each species/species group.

### Table 2.2: Field survey dates

| Biodiversity Field Survey | Defined Survey Area |
|---|---|
| UKHab classification, INNS, hedgerows | 07/06/2021 – 11/06/2021, 23/06/2021 – 25/06/2021, 11/10/2021 – 14/10/2021 |
| GCN HSI and eDNA | 07/06/2021 – 11/06/2021, 23/06/2021 – 25/06/2021, 29/06/2021 – 30/06/2021 |
| Badger survey | 10/06/2021 – 11/06/2021, 23/06/2021 – 25/06/2021 |
| Bat Survey – PGLRA | 07/06/2021 – 11/06/2021 |
| Bat survey – summer tree climbing inspection | 26/07/2021 – 30/07/2021, 05/08/2021 – 06/08/2021, 19/08/2021 – 20/08/2021, 26/08/2021 – 27/08/2021 |
| Bat Survey – emergence/re-entry | 02/08/2021 – 05/08/2021, 23/08/2021 – 26/08/2021, 20/09/2021 – 24/-09/2021, 27/08/2021 – 29/09/2021 |
| Bat Survey – tree climbing inspection for hibernation roosts | 17/01/2022 - 21/01/2022, 14/02/2022 – 18/02/2022 |

## 2.5 UK Habitat Classification, INNS and Hedgerows

*UKHab and INNS*

2.5.1 The UKHab field surveys were undertaken in accordance with The UK Habitat Classification User Manual Version 1.1 (Butcher *et al.,* 2020). The principal aim of UKHab is to provide a system for recording and classifying habitats. The system has a primary hierarchy of five nested levels of complexity, from major ecosystems at level 1, ecosystem type at level 2, broad habitats at level 3, habitats including priority habitats at level 4, down to habitats including Annex 1 habitats at level 5. The primary code classification can be supplemented by secondary codes to provide more information. Some secondary codes are mandatory in the classification of certain habitat types such as ponds and traditional orchards.

2.5.2 Dominant and notable plant species were recorded, and plant abundance was categorised using the DAFOR scale; Dominant (D), Abundant (A), Frequent (F), Occasional (O) and Rare (R). Botanical taxonomic nomenclature follows that of the New Flora of the British Isles; Fourth Edition (Stace, 2019). Surveying was at the fine scale minimum mapping unit (MMU) i.e. 25m$^2$ polygons and linear features greater than 1m in width. However, hedgerows and other linear features were maintained as lines with their dimensions recorded.

2.5.3 During the habitat survey, the presence and extent of any Invasive Non-Native Species (INNS) were also recorded.

2.5.4 The habitats were then assessed on their condition. Habitat condition is a score based on the quality of the habitat, judged against the perceived ecological optimum state for that particular habitat, and criteria set out in the Natural England Biodiversity Metric 3.0 Guidance (DEFRA, 2021).

2.5.5 It should be noted that areas of cropland, intensive orchards and domestic garden are not required to have a habitat condition assessment. Urban sealed land and buildings have also been excluded.

*Hedgerows*

2.5.6 Hedgerows form part of the UKHab methodology. However, three hedgerows were identified as requiring more in-depth survey as they had potential to meet the biodiversity criteria for 'Important' hedgerows under the Hedgerow Regulations 1997 and where there is a need for hedgerow to be removed/damaged. The survey involved recording key characteristics such as physical attributes, species diversity, gaps in canopy, management and associated features such as adjacent banks, walls and ditches. The survey recorded the following in 30m sections:

- Woody plants;
- Climbing plants;
- Woodland herbs, including those listed on Schedule 2 of the Hedgerows Regulations 1997 and ancient woodland indicators (Rose, 1999); and
- Invasive non-native plants, such as Himalayan balsam (*Impatiens glandulifera*).

## 2.6 Badger

2.6.1 The survey followed Natural England survey guidance (Natural England, 2011). Signs of badger activity such as the presence of setts, dung pits, latrines, snuffle holes, tracks, hairs, prints and scratch marks were recorded. Particular attention was paid to areas where the vegetation and/ or topography offered suitable sett building sites for badgers, for example sloping banks and areas with dense ground cover (e.g. hedgerows, scrub and woodland). All field signs were recorded and plotted on a collector map on an iPad and photographs were taken as a record of the site visit.

2.6.2 Any setts found were mapped and the number of individual entrances and tunnel direction was recorded. Setts were provisionally categorised according to Natural England (2011), using the following criteria:

- Main Sett: usually appearing well-used, well established, and having a large number of holes with big active spoil heaps, often with piles of old bedding outside. Main setts tend to have well-worn pathways between the sett and foraging areas and between sett holes. They are generally considered to be breeding setts (i.e. where cubs are most likely to be born) and are often in use all year round. A social group of badgers would typically only have one main sett within their territory.
- Annex Sett: always close to the main sett and are usually connected by one or more obvious well-worn pathways. They consist of several holes but are not necessarily in use the whole time, even if the main sett is very active. Should a second litter of cubs be born within the social group, they are likely to be raised within the annex sett.
- Subsidiary Sett: often have very few holes, are usually at least 50m from the main sett and do not have an obvious pathway connecting them to another sett. Subsidiary setts are not continuously active.
- Outlier Sett: usually comprise of one or two holes with very little spoil outside (thus indicating that the tunnel system underground is not extensive), have no obvious pathway connecting them with another sett and are used only sporadically.

2.6.3 An indication of the level of activity at each sett was made as follows (Natural England, 2009):

- Active:
  - In current use: Well-used sett entrances contain no debris or vegetation, are obviously regularly used and often show signs of having been recently excavated. Badger field signs such as latrines, guard hairs, dung pits or footprints are present.
  - Partially used: Setts or holes with entrances not in regular use and which have debris (twigs, leaves) around the entrance. However, they could potentially be used regularly in the future with little clearance necessary.
- Disused:
  - Setts or holes showing signs of not having been in use for a considerable period and would not be used again without extensive clearance by a badger. There would be no other badger field signs at disused setts.

## 2.7 Bats

2.7.1 Bat surveys were led by licenced bat ecologists in accordance with the Bat Conservation Trust Bat Survey Good Practice Guidelines 3rd edition (Collins, 2016).

*Preliminary Ground Level Roost Assessment (PGLRA) of Trees*

2.7.2 Trees within the survey area were assessed for their potential to support roosting bats. The trees were observed from ground level during the day using a high-powered torch and binoculars to inspect features from all aspects. Potential roosting opportunities looked for included features such as:

- Cavities within trunk and branches;
- Woodpecker holes;
- Knot and callus roles;
- Rot holes and deadwood;
- Damaged limbs;
- Splits and cracks;
- Severe weather i.e. frost cracks; and
- Lifted bark.

2.7.3 Evidence of roosting bats was also searched for including:

- Bat droppings, feeding remains and corpses (with notes made on quantity, freshness and type);
- Dark staining below an access point that may be caused by bat faeces or urine; and
- Staining around a hole that may be caused by the natural oils in bat fur.

2.7.4 Each tree was classified with a potential to support roosting bats, either high, moderate or low, according to the highest suitability Potential Roosting Feature (PRF) identified during the inspection as per Table 2.3. Trees with moderate and high potential were subject to further bat surveys as detailed in the following sections. Trees with negligible roosting potential were not recorded.

**Table 2.3*:* Bat roosting potential**

| Suitability | Roosting Habitat (adapted from Collins, 2016) |
|---|---|
| Negligible | Negligible habitat features on site likely to be used by roosting bats. |
| Low | A tree with one or more potential roosting sites that can be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). |
| Moderate | A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, condition and surrounding habitat, but unlikely to support a roost of high conservation status (i.e. maternity or hibernation roost). |
| High | A tree with one or more PRFs that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, condition and surrounding habitat. |

*Aerial Inspection and Tree Climbing*

2.7.5 Following the initial PGLRA, trees that were assessed as requiring further inspection at height were climbed as an alternative to dusk emergence and dawn re-entry surveys. A team of two suitably qualified ecologists accessed PRFs at height using a two-rope system. Once in a safe position within the tree, PRFs were inspected further with the use of an endoscope and a torch in search for bats, or evidence of bats. Following more in-depth inspection of PRFs, some trees were then reassessed for their potential to support roosting bats with some trees being downgraded or upgraded based on these inspections.

2.7.6 Following on from the initial aerial inspection, trees were then subject to numerous climbs across the active season for bats: moderate trees being climbed twice and high potential trees being climbed on three separate occasions.

*Bat Emergence and Re-entry Surveys*

2.7.7 Trees that were unsafe to climb or did not require tree climbing due to their potential being unlikely to benefit from aerial inspection, were subject to dusk emergence and dawn re-entry surveys whereby an ecologist observed the tree from ground level looking for bats exiting or accessing the PRFs at dusk or dawn, respectively. Bat calls were recorded on different bat detectors (Elekon Batlogger, Anabat Swift and Anabat Walkabouts) through the season. Infrared cameras were occasionally used to aid the bat survey and were used as a substitute surveyor. Where a roost was recorded during a dusk or dawn survey, the bat calls, and video footage where applicable, were analysed to confirm the bat species recorded in the field.

*Hibernation Surveys*

2.7.8 Trees that were assigned as having potential to support hibernating bats following the PGLRA and aerial inspections were subject to a further two climbing inspections: one visit in January 2022 and one visit in February 2022.

## 2.8 Great Crested Newt

2.8.1 Eleven waterbodies were identified within 250m the survey area with the potential to support GCN. Where access was permitted, waterbodies were subject to a Habitat Suitability Index (HSI) assessment to evaluate the suitability of each waterbody with regards to GCN and subsequently sampled for environmental DNA (eDNA) to assess presence/likely absence of GCN.

### *GCN Habitat Suitability Index*

2.8.2 This methodology considers ten suitability indices that are known to affect GCN and their utilization of certain habitats. These indices comprise: geographical location; waterbody area; waterbody permanence; water quality; shade cover; waterfowl presence; fish presence; pond density/number of ponds within 1km; terrestrial habitat quality; and waterbody macrophyte cover.

2.8.3 Each waterbody was assessed and assigned a score between 0 and 1, with values closer to 0 being less suitable for GCN and those closer to 1 being more suitable. These values were then multiplied together, and the tenth root calculated to give an overall HSI score for the waterbody (Oldham *et al*., 2000). Waterbodies were then allocated an associated predicted presence class, as shown in Table 2.4.

**Table 2.4: Habitat Suitability Index assessment scores**

| HSI score | Predicted presence class |
|---|---|
| 0.00 – 0.49 | Poor |
| 0.50 – 0.59 | Below average |
| 0.60 – 0.69 | Average |
| 0.70 – 0.79 | Good |
| 0.80 – 1.00 | Excellent |

### *GCN eDNA Sampling*

2.8.4 Each waterbody was sampled for the presence/likely absence of GCN by collecting water samples which were subsequently sent to a laboratory for testing in the hope of identifying GCN DNA. Twenty water samples were taken from around the perimeter of each waterbody using a 40ml ladle, focusing on areas most likely to be used by GCN. The water samples were then transferred into a single Whirl-Pak bag. Before each sample was taken, the water was gently stirred using the ladle. This is because eDNA will often be present in larger quantities at the bottom of the waterbody as it tends to sink in water. The Whirl-Pak bag was then gently shaken to mix eDNA across the whole water sample. A pipette was then used to transfer 15ml of water from the Whirl-Pak bag into each of six conical tubes containing a preserving fluid. Each conical tube was then vigorously shaken for ten seconds to mix the water sample and the preservative. The six conical tubes were then labelled and sent to the NatureMetrics lab for analysis.

## 2.9 Limitations and Caveats

2.9.1 An absence of desk study records does not mean an absence of such habitats and species in that area. It may be due to under-recording. The desk study is designed to give an overview of the habitats and species previously recorded in the local area and provides an indication of which habitats and species may be present.

2.9.2 This report outlines the results of a snapshot in time, protected species such as badgers, bats and GCN are mobile and may utilise, or move into and out of, an area at short notice and as such may have been missed during the surveys or may be present at different times of the year. Additionally, populations of plants are often transient in nature and a survey undertaken over a narrow time frame can only provide an indication of the species present.

2.9.3 Some habitats were very densely vegetated, including dense bramble scrub in woodland areas that made them inaccessible to surveyors. However, the areas that could not be accessed were relatively limited in size and could be mostly viewed from their edges, making it unlikely that any features of ecological importance were missed.

2.9.4 Land access was not granted by landowners to certain areas, meaning these areas were unable to be surveyed. This included one pond (P1 on Figure A3.7 in Annex 1 of this Appendix)) that was not able to be assessed for HSI or sampled for eDNA).

2.9.5 Between the commencement of the first UKHab survey in June 2021 and the final habitat surveys in October 2021, the Natural England Biodiversity Metric was updated from v2.0 to v3.0 with revised guidance and criteria for habitat condition assessment. Following the release of the new version, the original habitat conditions assessed using version 2.0 were updated in line with version 3.0 criteria.

2.9.6 Hedgerow h2a-12 was not surveyed in the field. Therefore, based on aerial mapping and other hedgerows in the vicinity, and as a precaution, it has been classified as priority hedgerow in good condition. Additionally, based on a desk top study, it has been assessed as not meeting ‘important’ hedgerow status.

# 3. Results

## 3.1 Desk Study

*Designated sites*

3.1.1 There are no SACs within 30km of the site for which bats are a qualifying feature. There are no SACs, SPAs or Ramsar sites within 2km of the site or have any hydrological connection with the site. There are no NNR, SSSI or LNR within 2km of the site.

3.1.2 There are nine non-statutory locally sites located within 2km of the site, the closest being located directly adjacent to the wayleave clearing through which the overhead lines are situated. These are Butler's Wood LoWS and Waldegrave Wood LoWS, both of which are also ancient woodlands. Table 3.1 details the LoWS within 2km of the site. Figure A3.1 in Annex 1 shows the location of these sites.

3.1.3 The Ancient Woodland Inventory identified a number of sites of Ancient and Semi-Natural Woodland which were concurrent with LoWS designations. These are also detailed in Table 3.1.

**Table 3.1: Non-statutory, locally designated sites within 2km of the site**

| LoWS name | Value | Features (adapted from EWT citations) | Approximate distance from site |
|---|---|---|---|
| Butler's Wood (Bra201) | National (included on the Ancient Woodland Inventory [AWI]) | Similar in structure to Waldegrave Wood. An ancient woodland dominated by pedunculate oak *Quercus robur.* The site holds a wide variety of floral ancient woodland indicator species including the native bluebell *Hyacinthoides non-scripta*, yellow pimpernel *Lysimachia nemorum*, primrose *Primula vulgaris,* and wood anemone *nemorosa.* | Immediately north |
| Waldegrave Wood (Bra200) | National (AWI) | Similar in structure to Butler's Wood. An ancient woodland dominated by pedunculate oak and ash *Fraxinus excelsior*. With an understory containing hazel *Corylus avellana* coppice and containing several ancient woodland indicator species including the native bluebell, wood anemone, primrose and wood sorrel *Oxalis acetosellla*. | Immediately south |
| Twinstead Green (Bra210) | County | Damp grassland with a small pond and scattered trees, the site is noted to contain a moderately diverse assemblage of herb species. | 600m ESE |
| Almshouse Wood (Bra211) | County | A woodland dominated by pedunculate oak, ash, birch, and hazel coppice. The ground flora has become dominated by bracken *Pteridium aquilinum* and bramble *Rubus fruticosus agg,* but ancient woodland indicators of primrose and dog's mercury *Mercurialis perennis* can be found. | 670 NE |
| Parsonage Wood (Bra196 | National (AWI) | An ancient woodland dominated by a birch *Betula sp* canopy and hazel understory, although there has been some replanting of conifer species historically. The site supports a wide variety of flora and bird species. | 900m N |
| Twinstead Marsh (Bra222) | County | This site holds a wide variety of habitats including alder *Alnus glutinosa* and willow *Salix sp* carr, marsh and open water. These provide a variety of habitats for notable species such as nightingales *Luscinia megarhynchos* and willow warblers *Phylloscopus trochilus.* | 1.38km E |

| LoWS name | Value | Features (adapted from EWT citations) | Approximate distance from site |
|---|---|---|---|
| Fenn Farm Mosaic (Bra223) | County | The site holds habitats ranging from willow carr, alder woodland, and marsh. The site supports a wide variety of wetland plant species. | 1.34km E |
| Twinsteadhall Wood (Bra219 | National (AWI) | Ancient woodland which has been replanted with coniferous species. The site holds a variety of ancient woodland ground flora species and supports a wide variety of invertebrate species. | 1.5km SE |
| Coopersfield Wood (Bra228) | County | A small woodland dominated by pedunculate oak, ash, birch, and poplar *Populus sp.* The site supports a variety of invertebrate and bird species. | 1.8km NE |

3.1.4 Habitats of Principal Importance (HPI) identified from the Priority Habitat Inventory comprised two parcels of deciduous woodland associated with Bulter's and Waldegrave Woods. Beyond this and up to 1km, were additional HPIs comprising further parcels of deciduous woodland and traditional orchard. These can be seen on Figure A3.1 in Annex 1.

*Protected, Priority and Notable Species*

3.1.5 A summary of species records provided by Essex Wildlife Trust, Essex Field Club and North East Essex Badger Group is provided below.

3.1.6 A large number of bird records were returned within 1km from the site. These are summarised below and shown in Figure A3.2 of Annex 1, in accordance with the Birds of Conservation Concern (BoCC) list (version 5) (Stanbury et al., 2021). This details the population status of birds in the UK; accordingly, each species is categorised onto the Green, Amber or Red List, indicating an increasing level of conservation concern. Particular species highlights were: cuckoo (*Cuculus* canorus); fieldfare (*Turdus pilaris)* (also Schedule 1 species), greenfinch (*Chloris chloris),* house sparrow (*Passer domesticus)*; lapwing (*Vanellus vanellus*); lesser redpoll (*Acanthis cabaret*), linnet (*Linaria cannabina*); merlin (*Falco columbarius*) (Also Schedule 1); mistle thrush (*Turdus viscivorus*); skylark (*Alauda arvensis*); starling (*Sturnus vulgaris*); woodcock (*Scolopax rusticola*); and yellowhammer (*Emberiza citronella*).

3.1.7 The scrub and hedgerow habitats along field margins and the A131 afford suitable conditions for priority species such as yellowhammer (Red List), linnet (Red List), house sparrow (Red List), starling (Red List), and mistle thrush (Red List).

3.1.8 Figure A3.3 in Annex 1 shows the spatial distribution of all other species records. Protected, priority and notable species records include brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*); badger (*Meles meles*) brown hare (*Lepus europaeus*) and great crested newt (*Triturus cristatus*).

3.1.9 A desk study search for European Protected Species (EPS) mitigation licences up to 2km from the site identified two bat licences, see Table 3.2.

**Table 3.2: EPS Licence within 2km of the site**

| Species | Date | Case reference for Granted Application | Grid reference | Approximate distance to the site |
|---|---|---|---|---|
| Brown long-eared and common pipistrelle | 2017-2027 | 2017-31391-EPS-MIT | TL862365 | 1.6km SE |
| Brown long-eared, common pipistrelle, soprano pipistrelle | 2018-2024 | 2018-37898-EPS-MIT | TL86013850 | 1.8km NE |

3.1.10 A desk study search for GCN records, using national Natural England pond surveys for District Level Licencing results between 2017-2019 and GCN Risk Zones, failed to identify any locations of GCN presence within 2km of the site. The site also falls within amber and green GCN risk zones. However, previous unpublished survey work by National Grid in 2012 at this location confirmed GCN presence within 250m of the site.

3.1.11 Dormouse surveys were undertaken by Suffolk Wildlife Trust in 2012 for the wider reinforcement project prior to project pause. The surveys included Butler's Wood, Waldegrave Wood and the hedgerow that connects the two areas of woodland adjacent to the A131. No dormice were recorded within these areas at that time. The nearest positive survey result was located 2.9km south east of the site. A precautionary approach is therefore being taken and dormice are assumed to be present where habitat is suitable to support them.

*INNS*

3.1.12 No records of INNS were returned within 1km of the site.

## 3.2 UK Habitat Classification, Hedgerows, and INNS Survey

*UKHab*

3.2.1 The habitats recorded within the survey area during field survey are described below, grouped by broad habitat types, and Habitats of Principal Importance (HPI) identified. The location and distribution of these habitats (with their habitat parcel references) can be seen in Figure A3.4 in Annex 1. Table 3.3 summarises the habitats recorded and their condition assessment. Botanical species lists are provided in Annex B and a full breakdown of condition assessments is provided in Annex C of this Appendix.

*Cropland (c)*

3.2.2 The survey area was predominantly formed from c1 cropland (arable).

*Hedgerow (h)*

3.2.3 Hedgerows recorded within the survey area were primarily bordering arable land or adjacent to roads/access tracks. Seven hedgerows were recorded, all qualifying as priority hedgerows (habitat parcel references h2a-2, h2a-4, h2a-5 to ha-7, h2a-10 and h2a12).

### *Grassland (g)*

3.2.4 The grassland areas recorded within the survey area were primarily other neutral grassland types along arable field margins (habitat parcel references g3c-6 and g3c-9). None of these grassland habitats are HPI.

### *Urban (u)*

3.2.5 Urban habitat types recorded were roads - built linear features (u1e).

### *Woodland and Forest (w)*

3.2.6 Woodland areas recorded within the survey area were primarily small areas of other broadleaved woodland types (habitat parcel references w1g7-1 to w1g7-5) but inclusive of the following HPI: Lowland Mixed Deciduous Woodland habitat - habitat parcel reference: w1f7-1, w1f7-2.

3.2.7 One line of trees was recorded within the survey area (habitat parcel reference w1g6-2).

**Table 3.3: UKHab parcels and conditions**

| Habitat | Habitat Codes Figure A3.6 | Condition | Notes |
|---|---|---|---|
| Lowland mixed deciduous woodland | w1f7-1 to w1f7-2 | Good | Priority habitat and two parcels of ancient woodland – numerous ancient woodland indicator species recorded |
| Other broadleaved woodland | w1g7-1 | Moderate | Small woodland and pond |
| Line of trees | w1g6-2 | Moderate | Mature oak with some gaps and some semi-mature trees included |
| Other neutral grassland | g3c-9 | Moderate | Arable field margin |
| | g3c-6 | Poor | Road verges along A131, inclusive of adjacent nettle dominated boundary habitats |
| Hedgerow (priority) | h2a-2, h2a-4 to h2a-7, h2a-10, h2a-12 | Moderate to Good | Mostly agricultural hedges separating arable field, and alongside tracks. Well maintained with diverse species and adjacent ground flora intact |

### *Rivers and Lakes (r)*

3.2.8 Within the survey area, no watercourses (rivers, streams, or lakes) were present. Ditches were present (see Annex 1 - Figure A3.4) and surveyed (see Table 3.4) but they were dry and unlikely to hold water for more than four months of the year. Therefore, the ditches recorded did not meet the criteria of relevant primary level UKHab classification and have been classified only through secondary habitat types dry (code: 117) and ditch (code 191) – shown as ‘Dry ditch’ on Figure A3.4 in Annex 1. Due to the ditches not holding water, all fail numerous criteria of the condition assessment automatically being assigned poor condition.

3.2.9 One pond is located within the 50m survey area, r1a6-3, but it does not qualify as a HPI. The pond was located within woodland with little submerged or riparian vegetation, was highly shaded and contained turbid water. As such it was assessed as being of poor condition.

## Table 3.4: Summary of ditches recorded

| Ditch ID | Approximate Length (m) | Notes |
|---|---|---|
| D1 | 130 | Dry ditch, dominated by grasses, shallow gradient adjacent to road and overlapping with hedgerow H3 for short section. |
| D6 | 270 | Dry ditch, dominated by grasses. Some rush species. Willow and oak saplings. One mature oak. |
| D9 | 1265 | Dry ditch network, agricultural, approx. 1-1.5m wide, may fill with water at other times of year but not for over 4 months - substrate under dense bramble moist in some places, dominated by grasses with cow parsley, red campion, nettles present. Steep gradient. |
| D12 | 330 | Dry ditch running along line of trees, where one line stops the ditch continues unshaded and deeper - appeared artificially dug, and re-joined second line of trees along southern field boundary. |

### *INNS*

3.2.10 Whilst carrying out the UKHab survey, three areas of invasive non-native variegated archangel (*Lamium galeobdolon* subsp. *Argentatum*) were recorded, see Figure A3.4 in Annex 1 and photographs 44 and 45 in Annex 5.

### *Hedgerows*

3.2.11 Full details of the condition of hedgerows within the 50m survey area can be seen in Annex 3. A summary of the hedgerow assessment is set out in Table 3.5. None of these hedgerows were classified as 'important' for biodiversity reasons under criteria 4 of the Hedgerow Regulations 1997.

## Table 3.5: Hedgerow assessment summary

| Hedgerow ID | Central grid reference | UKHab code & condition assessment | Hedgerow type | 'Important' hedgerow under regulations Y/N | Justification |
|---|---|---|---|---|---|
| h2a-2 | TL 84648 37136 | h2a – good condition | Shrubby hedgerow | N | None of the criteria met – six woody species present but none of required associated features present |
| h2a-5 | TL 84387 36700 | h2a - good condition | Shrubby hedgerow | N | None of the criteria met – five woody species present but only one required associated feature present (parallel hedge within 15m) |
| h2a-6 | TL 84392 36689 | h2a - good condition | Shrubby hedgerow | N | None of the criteria met – five woody species present but only one |

| Hedgerow ID | Central grid reference | UKHab code & condition assessment | Hedgerow type | 'Important' hedgerow under regulations Y/N | Justification |
|---|---|---|---|---|---|
| | | | | | required associated feature present (parallel hedge within 15m) |

## 3.3 Badger Survey

3.3.1 Table 3.6 details the findings of the badger survey. Badger sett locations, mammal burrows, and badger field signs are shown in Annex 1 - Figure A3.5.

### Table 3.6: Badger survey results

| ID (see Figure A3.7) | Grid reference | Sign of current use - Y/N | Description | Likely sett type |
|---|---|---|---|---|
| B1 | TL 84220 37204 | N | Disused single entrance. Tunnel heading NW into bank, tunnel SE facing. D shaped hole with soil and debris making entrance shallow | Outlier |
| B2 | TL 84241 37229 | Y | One hole - spoil in front worn down by recent rain, looks occasionally used. Some potential scratch/slide marks into entrance. Guard hairs around entrance. Another disused hole nearby and well-worn path. Tunnel heading NE entrance SW facing | Outlier |
| B3 | TL 84378 37160 | N | Mammal burrow around fallen tree root system - rabbit dropping nearby | N/A |
| B4 | TL 84448 37156 | N | Two holes. Potential disused badger sett / active fox den, fox poo nearby. May have at one point been used by badger but not in current use. Some smaller rabbit burrows in vicinity. | Outlier |
| B5 | TL 84465 37154 | N | One potential badger entrance, no signs of current use. Tunnel on bank going NW direction facing SE | Outlier |
| B6 | TL 84473 37162 | Y | Badger entrance with hairs, spoil with some bedding in spoil, tunnel going N toward woodland - S facing, rabbit burrows nearby but only one showing signs of current use by badger | Outlier |
| B7 | TL 84509 37167 | Y | Badger sett two entrances - 1 around base and roots of aspen tree, tunnel goes N, entrance S facing, second entrance 2m west, tunnel goes NE, entrance SW facing -could be chamber in between. Hairs found around entrances and some recent spoil | Annex/ Subsidiary |
| B8 | TL 84594 37197 | Y | Partially collapsed sett (could be old rabbit warren) two main entrances, badger hairs outside and flattened spoil by rain. Numerous other collapsed holes/ tunnels surrounding | Annex/ Subsidiary |

| ID (see Figure A3.7) | Grid reference | Sign of current use - Y/N | Description | Likely sett type |
|---|---|---|---|---|
| B9 | TL 85165 37221 | Y | Three sett entrances on bank, one showing large fresh spoil pile - two filled with loose debris. Clear pathway from track across ditch to holes. NW facing holes | Annex/ Subsidiary |
| B10 | TL 84996 37124 | Y | Badger sett under piles of bonfire wood. Two holes partially collapsed/ filled with debris from wood pile, one clear with some spoil. SE facing. Anecdotal evidence from member of public claimed wood recently dumped over existing sett so badgers dug new exits | Annex/ Subsidiary |
| B11 | TL 84905 37042 | Y | Badger entrance under tree roots, very smoothed down, compacted soil, some old spoil with numerous badger hairs in | Outlier |
| B12 | TL 84921 36958 | Y | Badger entrance on bank. Active with fresh spoil heap, footprint, clear open tunnel headed SE, entrance W facing | Outlier |
| B13 | TL 84913 36945 | Y | Badger sett with recent spoil heaps, two holes either side of line of trees - E facing hole heading NW direction, hole adjacent to crop also E facing heading W, badger hair in spoil | Outlier |
| B14 | TL 84953 36876 | Y | Large main sett 23+ holes, 18 showing signs of current use - fresh spoil, recent footprint, hairs in spoil and surround, other entrances partially collapsed. 10 holes are within hedge likely more along length but obscured by dense vegetation | Main |
| B15 | TL 84988 36907 | Y | Single badger entrance 40m north west of main sett in field – likely connected as tunnel looks to head toward B14. | Annex/ Subsidiary Linked to B14 |
| B16 | TL 85015 36873 | N | One disused badger entrance next to hedgerow, old spoil heap compacted with some vegetation growing through, partial debris in tunnel - hair found within compacted spoil | Outlier |
| B17 | TL 85053 36871 | Y | Badger entrance at base of mature oak tree trunk - hair and bark lifting found - entrance SW facing, and tunnel has NE direction to left of bark opening | Outlier |
| B18 | TL 84092 36643 | N | One potential badger entrance on side of road – no signs of activity | Outlier |
| B19 | TL 84160 36533 | Y | Main badger sett, at least 12 entrances in line of trees on bank with entrances in nearby grassland to east as well. Active signs fresh spoil and badger hairs, one latrine located nearby | Main |
| B20 | TL 84146 36472 | Y | Potential badger outlier fresh spoil outside | Outlier |
| B21 | TL 84733 37118 | N | Two holes one disused partially blocked, one with old spoil | Outlier |

### *Incidental sightings*

3.3.2 Numerous incidental sightings of live badger were recorded by surveyors carrying out bat dusk emergence and dawn re-entry surveys. The location of these can also be seen in Figure A3.5 in Annex 1.

## 3.4 Bat Survey

3.4.1 A summary of the bat surveys undertaken can be seen in Table 3.7 and full survey results of PGLRA is shown in Figure A3.6 of Annex 1. An analysis of bat call recordings is also given in Annex 4.

### *Preliminary Ground Level Bat Roost Assessment (PGLRA)*

3.4.2 Forty four trees were recorded with potential to support roosting bats, see Figure A3.6 in Annex 1. No bats, or evidence of bat such as droppings, were recorded during the PGLRA.

3.4.3 Of these trees, 30 were identified as requiring further aerial inspection through tree climbing surveys. The remaining trees were identified as requiring dusk emergence and dawn re-entry surveys either because trees were unsafe to climb, or because the tree was unlikely to benefit from further inspection.

### *Bat Active Season Tree Climbing Surveys*

3.4.4 During the tree climbing surveys, eleven trees had their level of bat roost potential either downgraded or upgraded depending on the internal characteristics of features recorded.

3.4.5 One confirmed roost was identified during the tree climbing surveys at TC27 (photo 32 – Annex 5). At least two individuals of a *Myotis* bat species were identified through use of an endoscope camera. Bat droppings were collected and sent to a laboratory for analysis. The laboratory results confirmed that the droppings were from Natter's bat (*Myotis nattereri*).

### *Bat Emergence and Re-entry Surveys*

3.4.6 One transitional roost of a soprano pipistrelle (*Pipistrellus pygmaeus*) was recorded in T16 (Photo 31 – Annex 5). Please note, this tree is now located outside of the survey area. A single bat was recorded through infrared camera dropping down from a woodpecker hole on the northern aspect, flying around the tree and perching on the opposite side near an additional woodpecker hole. This footage was recorded at approximately 20:23 on 23 September 2021. Call sound analysis confirmed the species as being soprano pipistrelle, as seen in Annex 4.

3.4.7 No other bats were recorded emerging from, or re-entering, the trees during the dusk and dawn surveys.

## Table 3.7: Bat survey results summary

| Tree ID | Potential assigned at PGLRA | Potential following tree climbing surveys | Active Season Survey Type | Hibernation Potential Y/N | Hibernation surveys carried out Y/N | Roost recorded Y/N |
|---|---|---|---|---|---|---|
| TC1 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC2 | Moderate | High | Climbing inspection | Y | Y | N |
| TC3 | Moderate | Moderate | Climbing inspection | Y | N – Unsafe to climb | N |
| TC4 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC5 | Moderate | Negligible | Climbing inspection- downgraded potential - no further survey | N | N/A | N/A |
| TC6 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC7 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC8 | Moderate | Moderate | Climbing inspection | Y | Y | N |
| TC9 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC10 | Moderate | Moderate | Climbing inspection | Y | Y | N |
| TC11 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC12 | Moderate | Low | Climbing inspection- downgraded potential - no further survey | N | N/A | N/A |
| TC13 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC14 | Moderate | Moderate | Climbing inspection | Y | Y | N |
| TC15 | Moderate | High | Climbing inspection | Y | Y | N |

| Tree ID | Potential assigned at PGLRA | Potential following tree climbing surveys | Active Season Survey Type | Hibernation Potential Y/N | Hibernation surveys carried out Y/N | Roost recorded Y/N |
|---|---|---|---|---|---|---|
| TC16 | Moderate | Moderate | Climbing inspection | Y | Y | N |
| TC17 | Moderate | Low | Climbing inspection- downgraded potential - no further survey | N | N/A | N/A |
| TC19 | Moderate | High | Climbing inspection | Y | Y | N |
| TC20 | Moderate | Negligible | Climbing inspection- downgraded potential - no further survey | N | N/A | N |
| TC21 | Moderate | Low | Climbing inspection- downgraded potential - no further survey | N | N/A | N/A |
| TC22 | Moderate | Moderate | Climbing inspection | Y | Y | N |
| TC23 | High | High | Climbing inspection | Y | Y – inspected from ground level | N |
| TC24 | Moderate | Moderate | Climbing inspection | N | N/A | N |
| TC25 | Moderate | High | Climbing inspection | Y | Y | N |
| TC26 | Moderate | Low | Climbing inspection | N | N/A | N/A |
| TC27 | Moderate | Moderate | Climbing inspection | Y | Y | **Y** |
| TC28 | Moderate | High | Climbing inspection | Y | Y | N |
| TC29 | Moderate | Moderate | Climbing inspection | Y | Y | N |
| TC32 | N/A - not recorded at PGLRA | High | Climbing inspection | Y | Y | N |
| TC33 | N/A - not recorded at PGLRA | Moderate | Climbing inspection | N | N/A | N |

| Tree ID | Potential assigned at PGLRA | Potential following tree climbing surveys | Active Season Survey Type | Hibernation Potential Y/N | Hibernation surveys carried out Y/N | Roost recorded Y/N |
|---|---|---|---|---|---|---|
| T1 | High | N/A - climb not required | Emergence/re-entry survey | Y | Y – inspected from ground level | N |
| T2 | Moderate | N/A - climb not required | Emergence/re-entry survey | Y | Y – no roost recorded | N |
| T3 | Moderate | N/A - climb not required | Emergence/re-entry survey | N | N/A | N |
| T4 | High | N/A - climb not required | Emergence/re-entry survey | Y | Y – inspected from ground level | N |
| T5 | Moderate | N/A - climb not required | Emergence/re-entry survey | N | N/A | N |
| T6 | Moderate | N/A - climb not required | Emergence/re-entry survey | Y | Y – inspected from ground level | N |
| T7 | High | N/A - climb not required | Emergence/re-entry survey | Y | N – unsafe to climb | N |
| T8 | High | N/A - climb not required | Emergence/re-entry survey | Y | N – unsafe to climb | N |
| T9 | High | N/A - climb not required | Emergence/re-entry survey | Y | Y – inspected from ground level | N |
| T10 | Moderate | N/A - climb not required | Emergence/re-entry survey | Y | N – unsafe to climb – bark checked from ground level where possible | N |
| T11 | Moderate | N/A - climb not required | Emergence/re-entry survey | N | N/A | N |
| T12 | Moderate | N/A - climb not required | Emergence/re-entry survey | N | N/A | N |

| Tree ID | Potential assigned at PGLRA | Potential following tree climbing surveys | Active Season Survey Type | Hibernation Potential Y/N | Hibernation surveys carried out Y/N | Roost recorded Y/N |
|---|---|---|---|---|---|---|
| T13 | Moderate | N/A - climb not required | Emergence/re-entry survey | N | N/A | N |
| T15 | Moderate | N/A - climb not required | Emergence/re-entry survey | N | N/A | N |

3.4.8 Bat activity within the survey area was recorded during the emergence and re-entry surveys, with the most activity being recorded within Butler's Wood (habitat parcel reference: w1f7-1) and Waldegrave Wood (habitat parcel ref: w1f7-2).

3.4.9 Species recorded foraging and commuting during the surveys included:

- Common pipistrelle (Pipistrellus pipistrellus);
- Soprano pipistrelle;
- *Myotis* species;
- European barbastelle (*Barbastella barbastellus*);
- Noctule (*Nyctalus noctula*); and
- Brown long eared bat (*Plecotus auritus*).

3.4.10 There was notable activity of barbastelle bat in Butler's Wood and Waldegrave Wood (habitat parcel references: w1f7-1 and w1f7-2 on Figure A3.4 of Annex 1). Barbastelle bat was recorded foraging and commuting in both woodlands across all three survey visits. On occasion during surveys between 3rd and 5th August surveyors were able to gain sight of three to four barbastelle bats foraging together in the canopy.

*Hibernation Surveys*

3.4.11 No bat roosts were recorded during the hibernation surveys. Some of the trees had become unsafe to climb and so could not be fully inspected for hibernating bats.

3.4.12 A summary of the bat roosts identified is given in Table 3.8. Photographs of the tree roosts are in Annex 5 (Photos 30-32).

**Table 3.8: Bat roosts recorded**

| Tree ID | Date | Roost type | Roost feature | Species | No. of bats |
|---|---|---|---|---|---|
| TC27 Photo 32 – Annex E | 20/08/2021 – summer tree climb and inspection | Summer day roost | Knot hole on main stem facing west | Natterer's bat *Myotis nattereri* | 2-3 |
| *T16 Photo 31 – Annex E | 23/09/2021 - dusk emergence | Transitional | Woodpecker hole on main stem facing west | Soprano pipistrelle *Pipistrellus pygmaeus* | 1 |

*Now outside of survey area

## 3.5 Great Crested Newt Survey

3.5.1 The results of the GCN eDNA and HSI surveys are summarised in Table 3.9 and shown in Figure A3.7 of Annex 1. Two waterbodies (P5 and P6) returned positive tests for GCN eDNA, confirming GCN presence. One waterbody (P11) returned inconclusive[1] results. Photos of waterbodies testing positive for GCN eDNA can be seen in Annex 5.

[1] An inconclusive result can be issued for numerous of reasons: DNA from the great crested newt has not been detected but the controls have indicated that the sample has been degraded; DNA from the great crested newt has not been detected but the controls have indicated that the PCR has been inhibited. Additionally an inconclusive result may be due to the water chemistry, sediment or other debris in the sample. Therefore inconclusive findings cannot be used as definitive result to cause either presence or absence.

3.5.2 One waterbody (P1) could not be surveyed due to land access restriction(see Section 2.9). Four ditches were found upon initial survey to be dry and therefore unsuitable for GCN.

### Table 3.9: GCN HSI and eDNA results

| Waterbody name | Grid reference | Description | HSI score | HSI class | eDNA result |
|---|---|---|---|---|---|
| P1 | Access denied | | | | |
| P5 | TL 84459 37332 | Large waterbody. Leaf litter dense on shallow margins, little aquatic vegetation, maybe some signs of pollution from oil on surface, steeper banks on west side, bracken and common nettle on banks, ducks observed. | 0.79 | Good | **Positive** |
| P6 | TL 84479 37254 | L shaped waterbody, some duckweed cover and small rush, some deadwood present, shallow bank, bramble bracken nettle on banks, common blue damselfly observed. | 0.78 | Good | **Positive** |
| P7 | TL 84733 37130 | Waterbody in copse of willow and oak trees, very little submerged or marginal vegetation, fallen branches and deadwood in waterbody, shallow banks not very vegetated apart from common nettle. | 0.75 | Good | Negative |
| P8 | TL 84898 37301 | Dry ditch in arable field, has two 90-degree bends, steep grassy banks and occasional trees. | N/A | N/A | N/A |
| P9 | TL 84881 37145 | Small, isolated waterbody in arable field, lots of catkins and leaf litter from surrounding willow trees, and algae in water. | 0.5 | Below average | Negative |
| P10 | TL 84520 36950 | Dry L shaped ditch, steep banks, surrounded by ferns, likely seasonally filled with water for short time. | N/A | N/A | N/A |
| P11 | TL 84331 36969 | Waterbody in woodland, shallow banks, surrounded by silver birch, algal bloom and signs of pollution, no aquatic vegetation. | 0.55 | Below average | Inconclusive |
| P12 | TL 84218 37180 | Dry ditch bordering woodland and arable field, steep grass banks. | N/A | N/A | N/A |
| P13 | TL 84076 36382 | Long dry ditch running adjacent to arable field with steep banks and line of trees on one of the banks – hazel, oak and hawthorn. | N/A | N/A | N/A |
| P23 | TL 84344 37285 | Small woodland waterbody, shallow with shallow bank, little to no vegetation. | 0.47 | Poor | Negative |

## References


Altringham J. (2003) British Bats. London, UK.

Biggs, J., Edwald, N., Valentini, A., Gaboriaud, C.,Griffiths, R.A., Foster, J. Wilkinson, J., Arnett A,. Williams, P., and Dunn, F. (2014). Analytical and Methodological Development for Improved Surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford, UK.

Butcher, B., Carey, P., Edmonds, R. Norton, L. and Treeweek, J. (2020) The UK Habitat Classification User Manual 1.1 at http://www.ukhab.org/ [accessed June 2021]

Butcher, B., Carey, P., Edmonds, R. Norton, L. and Treeweek, J. (2020) The UK Habitat Classification Field Key at http://www.ukhab.org/ [accessed June 2021]

Chartered Institute of Ecology and Environmental Management (2017) Guidelines for Preliminary Ecological Appraisal. Revised 3rd Edition. CIEEM, Winchester.

Collins, J. (ed) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines. (3rd Edition). Bat Conservation Trust, London, UK.

Clark (2007). Badgers. Whittet Books, Suffolk, UK.

Defra (2019) Biodiversity Metric 2.0 Calculation Tool (December 2019 update). Available at http://publications.naturalengland.org.uk/publication/5850908674228224 [accessed 06/06/2021]

Defra (2019) The Biodiversity Metric 2.0 – User Guide – Beta Test. Available at http://publications.naturalengland.org.uk/publication/5850908674228224 [accessed 06/06/2021]

Defra (2019) The Biodiversity Metric 2.0 – Technical Supplement – Beta Test. Available at http://publications.naturalengland.org.uk/publication/5850908674228224 [accessed 06/06/2021]

Defra (2019) Biodiversity Metric 3.0 Calculation Tool. Available at http://publications.naturalengland.org.uk/publication/6049804846366720 [accessed 15/09/2021]

Defra (2021) The Biodiversity Metric 3.0 – User Guide – Beta Test. Available at http://publications.naturalengland.org.uk/publication/6049804846366720 [accessed 15/09/2021]

Defra (2021) The Biodiversity Metric 3.0 – Technical Supplement . Available at http://publications.naturalengland.org.uk/publication/6049804846366720 [accessed 15/09/2021]

DEFRA( 2007). Hedgerow Survey Handbook: a standard procedure for local surveys in the UK. London, UK.

MAGIC (2021) MAGIC on the MAP. Online at: https://magic.defra.gov.uk/magicmap.aspx [Accessed October 2021]

National Grid (2022) Bramford to Twinstead – 2.1 Preliminary Environmental Information Report. Issue number: BT-JAC-560-0007.

Natural England (2009). Guidance on ‘Current Use’ in the definition of a Badger sett. Natural England, UK.

Natural England (2011). Badgers and Development – A Guide to Best Practice and Licensing. Natural England Interim Document Revised 12/11. Natural England, UK.

Natural England (2021) Designated Sites View. Available at: https://designatedsites.naturalengland.org.uk [Accessed 10/10/21/]

Natural England (2021). Ancient Woodland (England). [Online] Available at: https://data.gov.uk/dataset/9461f463-c363-4309-ae77-fdcd7e9df7d3/ancient-woodland-england [Accessed 05/09/21]

Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000). Evaluation of the Suitability of Habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143-155.

Rose, D., O'Reilly C., Collings, c. (2006) The Wildflower Key. London UK

Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing. Exeter, UK.

Stace, C. (2019). New Flora of the British Isles (4th Ed), Cambridge University Press. London, UK.

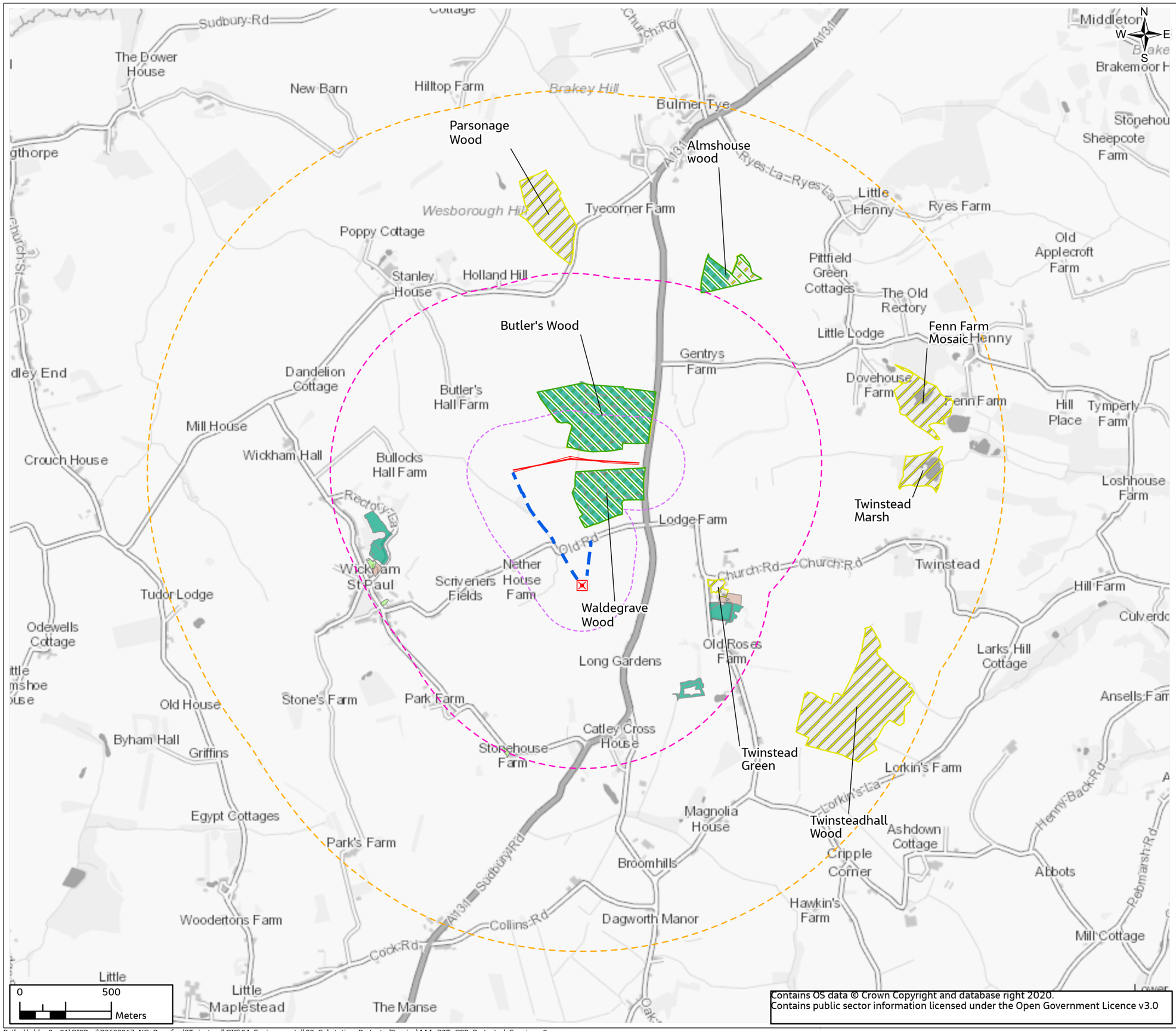
Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds (114) 723-747

Woodland Trust (2021) Ancient Tree Inventory. Available at https://ati.woodlandtrust.org.uk [Accessed 10/10/21/]

# Annex 1: Figures

Figure A3.1 – Designated Sites and Priority Habitats
Figure A3.2 – Desk Study - Birds
Figure A3.3 – Desk Study – Excluding Birds
Figure A3.4 – UK Habitat, INNS and Hedgerow Survey Results
Figure A3.5 – Badger Survey Results
Figure A3.6 – Bat Survey Results
Figure A3.7 – Great Crested Newt Survey Results

# FIGURE A3.1




## Legend

- Overhead Line Works (Section 37)
- Temporary Access
- 250m Study Area
- 1km Study Area
- 2km Study Area
- Local Wildlife Site
- Ancient Woodland

Priority Habitats

- Deciduous woodland
- Good quality semi-improved grassland
- Lowland dry acid grassland
- No main habitat but additional habitats present
- Traditional orchard


| Rev. | Date | Purpose of revision | Drawn | Check'd | Rev'd | Appr'd |
|---|---|---|---|---|---|---|
| 0 | 05/2022 | Final | JT | FM | LG | RC |


Jacobs

160 Dundee St, Edinburgh, EH11 1DQ, UK.
Tel: +44(0)131 659 1500
www.jacobs.com


Client: nationalgrid

Project: OVERHEAD LINE WORKS OFF THE A131

Drawing Title: Designated sites and Priority habitats

Page 1 of 1

Drawing Status: Final

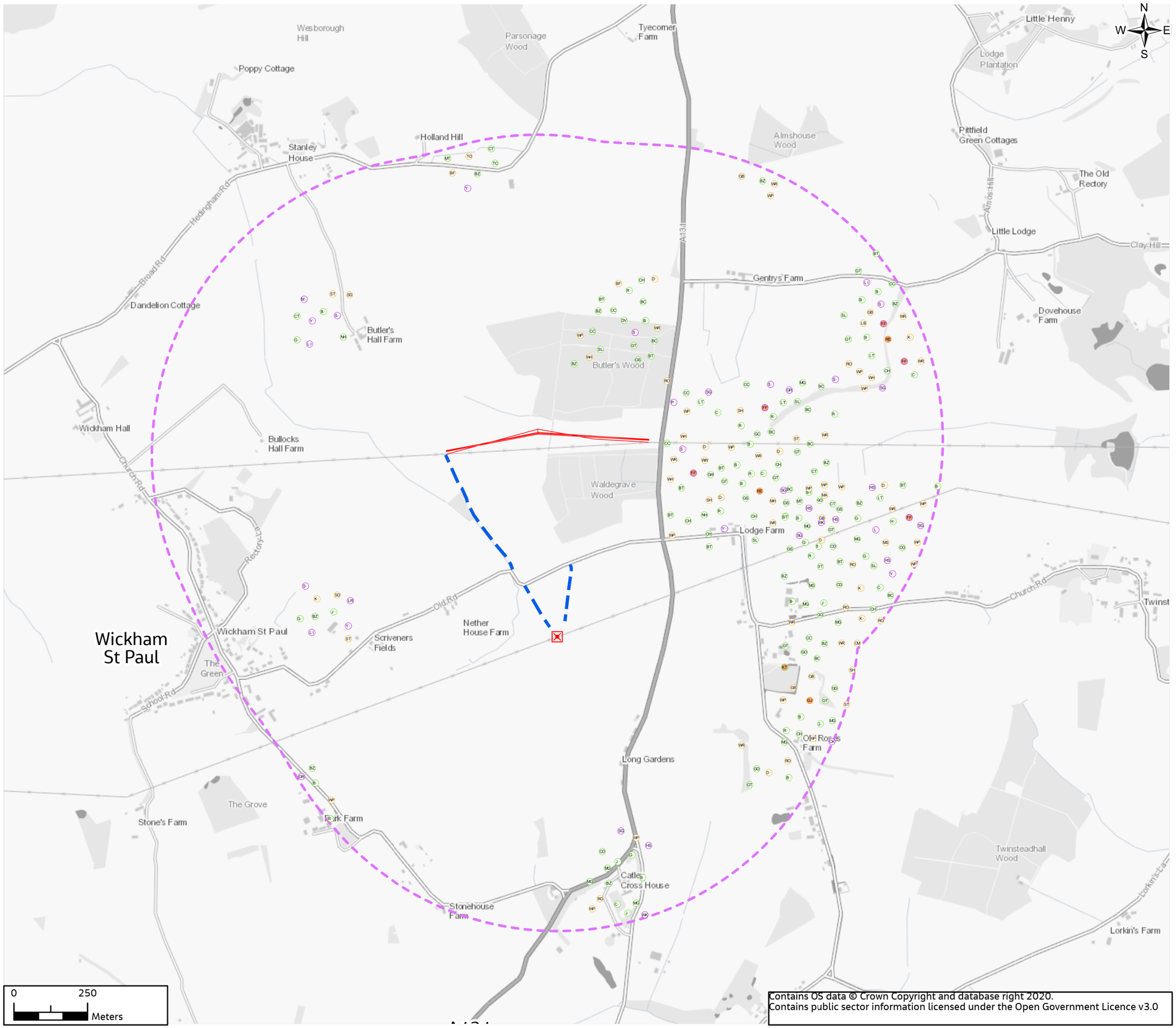
| | | |
|---|---|---|
| Scale @ A3 | 1:20,000 | DO NOT SCALE |
| Jacobs No. | B2416601 | |
| Client No. | BT-NG-020627-560-0032 | |
| Drawing No. | AAA_B2T_GSP_Protected_Species_Fig3.1_Rev0 | |





Path: \\gblon0vs01\GISProj\B2600017_NG_Bramford2Twinstead\GIS\04_Environmental\09_Substation_ProtectedSpecies\AAA_B2T_GSP_Protected_Species_v2.aprx

# FIGURE A3.2




Contains OS data © Crown Copyright and database right 2020.
Contains public sector information licensed under the Open Government Licence v3.0

Legend

- Overhead Line Works (Section 37)
- Temporary Access
- 1km Study Area

WCA- Schedule 1 Species

- FF Fieldfare (IUCN-Red)
- ML Merlin (IUCN-Red)
- GJ Greylag Goose (IUCN-Amber)
- KF Kingfisher (IUCN-Amber)
- RE Redwing (IUCN-Amber)
- KT Red Kite (IUCN-Green)

BoCC v5 - Red

- CK Cuckoo
- GR Greenfinch
- P Grey Partridge
- HF Hawfinch
- HG Herring Gull
- HS House Sparrow
- L Lapwing
- LR Lesser Redpoll
- L Linnet
- M Mistle Thrush
- N Nightingale
- S Skylark
- SF Spotted Flycatcher
- SG Starling
- WK Woodcock
- Y Yellowhammer

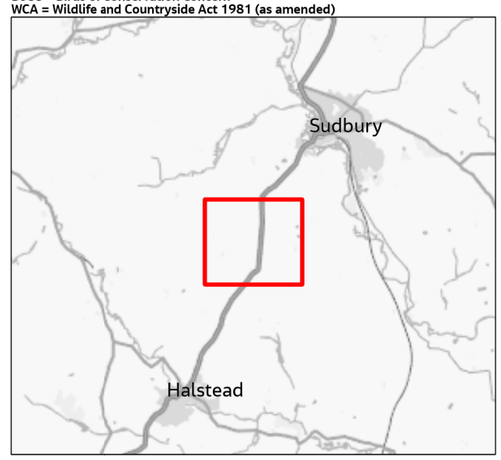
BoCC v5 - Amber

- GB Black-headed Gull
- BF Bullfinch
- CM Common Gull
- D Dunnock
- WR Wren
- HM House Martin
- K Kestrel
- LB Lesser Black-backed Gull
- MA Mallard
- MP Meadow Pipit
- MH Moorhen
- MS Mute Swan
- RB Reed Bunting
- RO Rook
- SN Snipe
- ST Song Thrush
- SH Sparrowhawk
- SD Stock Dove
- TO Tawny Owl
- WH Whitethroat
- WW Willow Warbler
- WP Woodpigeon

BoCC v5 - Green

- B Blackbird
- BC Blackcap
- BZ Buzzard
- C Carrion Crow
- CH Chaffinch
- CC Chiffchaff
- CT Coal Tit
- CD Collared Dove
- CO Coot
- CA Cormorant
- BT Blue Tit
- G Green Woodpecker
- GW Garden Warbler
- GC Goldcrest
- GO Goldfinch
- GK Great Crested Grebe
- GS Great Spotted Woodpecker
- GT Great Tit
- H Grey Heron
- J Jay
- LG Little Grebe
- LT Long-tailed Tit
- MG Magpie
- MT Marsh Tit
- NH Nuthatch
- PW Pied/White Wagtail
- R Robin
- DV Rock Dove
- SL Swallow
- TC Treecreeper
- TU Tufted Duck
- WX Waxwing

**BoCC = Birds of Conservation Concern**
**WCA = Wildlife and Countryside Act 1981 (as amended)**




| Rev. | Date | Purpose of revision | Drawn | Check'd | Rev'd | Appr'd |
|---|---|---|---|---|---|---|
| 0 | 05/2022 | Final | JT | FM | LG | RC |


Jacobs
160 Dundee St, Edinburgh, EH11 1DQ, UK.
Tel: +44(0)131 659 1500
www.jacobs.com


Client: nationalgrid

Project: OVERHEAD LINE WORKS OFF THE A131

Drawing Title: Desk Study - Birds

Page 1 of 1

Drawing Status: Final

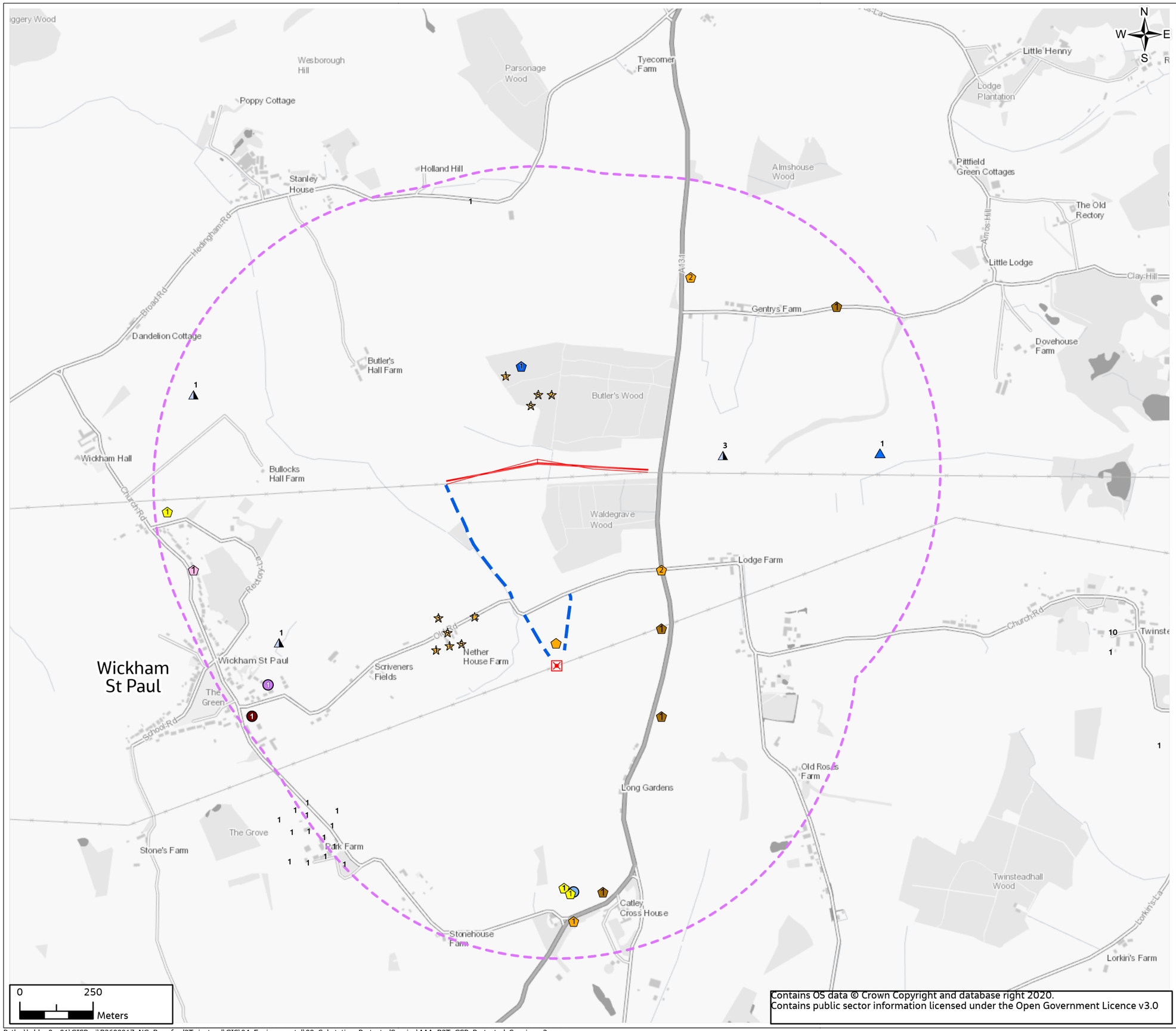
| | | |
|---|---|---|
| Scale @ A3 | 1:12,500 | DO NOT SCALE |
| Jacobs No. | B2416601 | |
| Client No. | BT-NG-020627-560-0032 | |

Drawing No. AAA_B2T_GSP_Protected_Species_Fig3.2_Rev01



Path: \\gblon0vs01\GISProj\B2600017_NG_Bramford2Twinstead\GIS\04_Environmental\09_Substation_ProtectedSpecies\AAA_B2T_GSP_Protected_Species_v2.aprx

# FIGURE A3.3






Legend

- Overhead Line Works (Section 37)
- Temporary Access
- 1km Study Area

Bat Species

- Brown Long-eared Bat
- Common Pipistrelle
- Pipistrelle species

Mammal

- Eurasian Water Shrew
- Stoat
- Harvest Mouse
- Hedgehog
- Badger
- Brown Hare

Amphibian

- Great Crested Newt

Invertebrate

- Small Heath

Plant

- Bluebell

Where recorded, abundance of species is shown within point.


| Rev. | Date | Purpose of revision | Drawn | Check'd | Rev'd | Appr'd |
|---|---|---|---|---|---|---|
| 0 | 05/2022 | Final | JT | FM | LG | RC |

Jacobs
160 Dundee St, Edinburgh, EH11 1DQ, UK.
Tel: +44(0)131 659 1500
www.jacobs.com

Client: nationalgrid

Project: OVERHEAD LINE WORKS OFF THE A131

Drawing Title: Desk Study - Excluding Birds

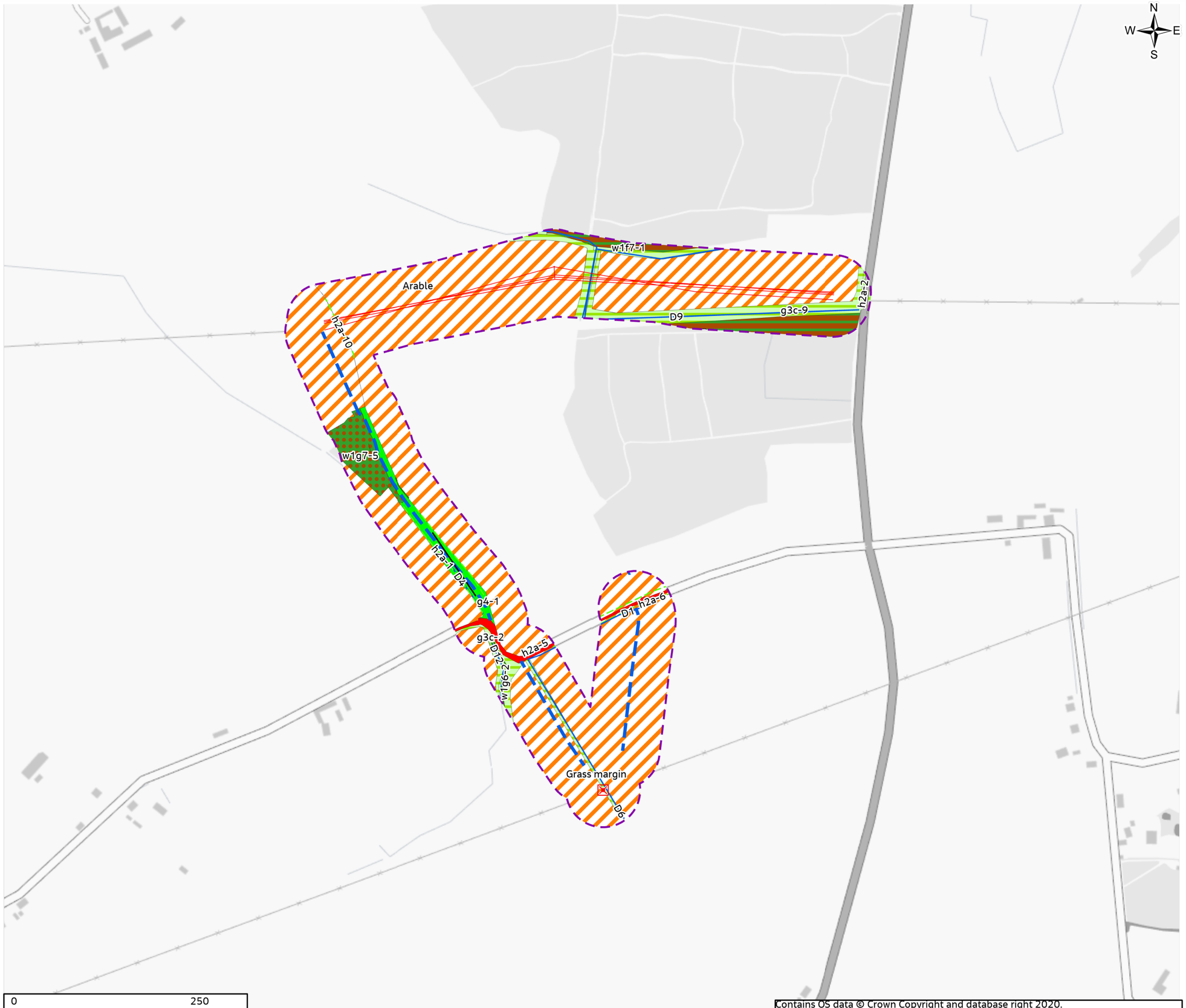
Page 1 of 1

| | | |
|---|---|---|
| Drawing Status | Final | |
| Scale @ A3 | 1:12,500 | DO NOT SCALE |
| Jacobs No. | B2416601 | |
| Client No. | BT-NG-020627-560-0032 | |
| Drawing No. | AAA_B2T_GSP_Protected_Species_Fig3.3_Rev02 | |



Path: \\gblon0vs01\GISProj\B2600017_NG_Bramford2Twinstead\GIS\04_Environmental\09_Substation_ProtectedSpecies\AAA_B2T_GSP_Protected_Species_v2.aprx

# FIGURE A3.4




Legend

- Overhead Line Works (Section 37)
- Temporary Access
- 50m Survey Area

Habitat type (UK Hab)

- w1g6 - Line of trees
- Dry Ditch
- h2a - Hedgerow (priority habitat)

primary

- c1 - arable and horticulture
- g3c - other neutral grassland
- g4 - modified grassland
- u1e - built linear features
- w1f7 - Other Lowland mixed deciduous woodland (priority habitat
- w1g - other woodland, broadleaved


| Rev. | Date | Purpose of revision | Drawn | Check'd | Rev'd | Appr'd |
|---|---|---|---|---|---|---|
| 0 | 05/2022 | Final | JT | FM | LG | RC |


Jacobs

160 Dundee St, Edinburgh, EH11 1DQ, UK.
Tel: +44(0)131 659 1500
www.jacobs.com


Client: nationalgrid

Project: OVERHEAD LINE WORKS OFF THE A131

Drawing Title: UK Habitat, Invasive Non-Native Species and Hedgerows

Page 1 of 1

Drawing Status: Final

| | | |
|---|---|---|
| Scale @ A3 | 1:5,000 | DO NOT SCALE |
| Jacobs No. | B2416601 | |
| Client No. | BT-NG-020627-560-0032 | |

Drawing No.: AAA_B2T_GSP_Protected_Species_Fig3.4_Rev01

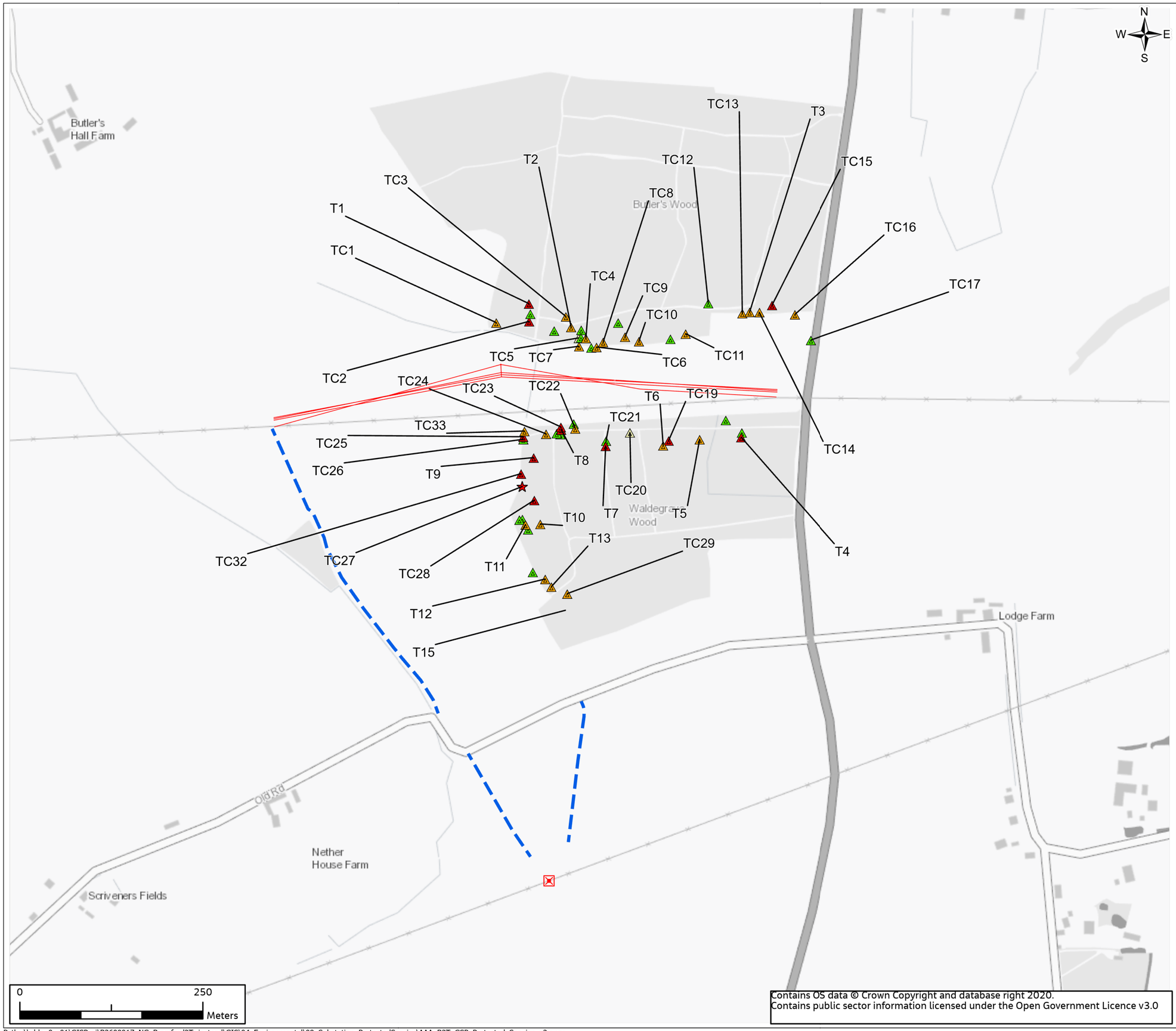




Path: \\gblon0vs01\GISProj\B2600017_NG_Bramford2Twinstead\GIS\04_Environmental\09_Substation_ProtectedSpecies\AAA_B2T_GSP_Protected_Species_v2.aprx

*Figure A3.5 (Badger Survey Results) contains confidential information and can be provided on request*

# FIGURE A3.6




Legend

- Overhead Line Works (Section 37)
- Temporary Access

Bat Potential Tree

- Confirmed Roost
- High
- Moderate
- Low
- Negligible


| Rev. | Date | Purpose of revision | Drawn | Check'd | Rev'd | Appr'd |
|---|---|---|---|---|---|---|
| 0 | 05/2022 | Final | JT | FM | LG | RC |


Jacobs

160 Dundee St, Edinburgh, EH11 1DQ, UK.
Tel: +44(0)131 659 1500
www.jacobs.com


Client: nationalgrid

Project: OVERHEAD LINE WORKS OFF THE A131

Drawing Title: Bat Survey Results

Page 1 of 1

Drawing Status: Final

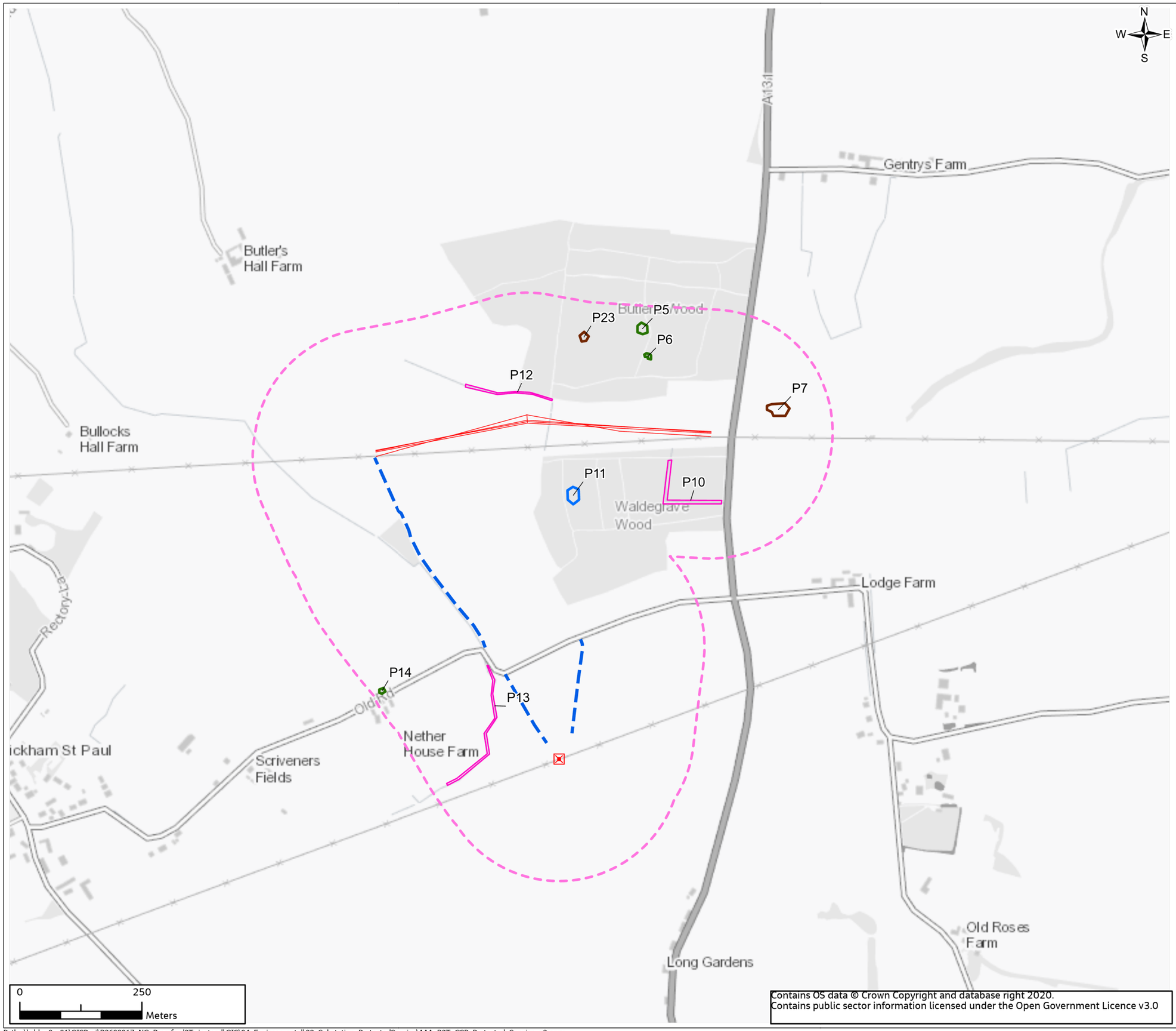
| | | |
|---|---|---|
| Scale @ A3 | 1:5,000 | DO NOT SCALE |
| Jacobs No. | B2416601 | |
| Client No. | BT-NG-020627-560-0032 | |

Drawing No.: AAA_B2T_GSP_Protected_Species_Fig3.6_Rev02



Path: \\gblon0vs01\GISProj\B2600017_NG_Bramford2Twinstead\GIS\04_Environmental\09_Substation_ProtectedSpecies\AAA_B2T_GSP_Protected_Species_v2.aprx

# FIGURE A3.7




Legend

- Overhead Line Works (Section 37)
- Temporary Access
- 250m Survey Area

GCN eDNA Survey Results selection

eDNA Result

- Positive
- Negative
- Inconclusive
- N/A
- Not Surveyed


| Rev. | Date | Purpose of revision | Drawn | Check'd | Rev'd | Appr'd |
|---|---|---|---|---|---|---|
| 0 | 05/2022 | Final | JT | FM | LG | RC |


Jacobs

160 Dundee St, Edinburgh, EH11 1DQ, UK.
Tel: +44(0)131 659 1500
www.jacobs.com


Client: nationalgrid

Project: OVERHEAD LINE WORKS OFF THE A131

Drawing Title: Great Crested Newt Survey Results

Page 1 of 1

Drawing Status: Final

| | | |
|---|---|---|
| Scale @ A3 | 1:7,500 | DO NOT SCALE |
| Jacobs No. | B2416601 | |
| Client No. | BT-NG-020627-560-0032 | |
| Drawing No. | AAA_B2T_GSP_Protected_Species_Fig3.7_Rev02 | |





Path: \\gblon0vs01\GISProj\B2600017_NG_Bramford2Twinstead\GIS\04_Environmental\09_Substation_ProtectedSpecies\AAA_B2T_GSP_Protected_Species_v2.aprx

# Annex 2: Botanical Species Lists

## Table 1: Lowland mixed deciduous woodland - HPI – Butler's Wood Ancient Woodland - w1f7-1

| Common name | Latin Name | Abundance |
|---|---|---|
| **Canopy Layer** | | |
| Oak | *Quercus robur* | D |
| Hazel | *Corylus avellana* | D |
| Ash | *Fraxinus excelsior* | A |
| Silver Birch | *Betula pendula* | F |
| Field maple | *Acer campestre* | F |
| Holly | *Ilex aquifolium* | O |
| Wild cherry* | *Prunus avium* | O |
| Hawthorn | *Crataegus monogyna* | O |
| Goat willow | *Salix caprea* | O |
| Small leaved lime* | *Tilia cordata* | R |
| Dogwood | *Cornus sanguinea* | R |
| Elder | *Sambucus nigra* | R |
| **Ground Flora** | | |
| Wood anemone* | *Anemone nemororsa* | A |
| Bluebell* | *Hyacinthoides non-scripta* | A |
| Bracken | *Pteridium* | A |
| Cleavers | *Galium aparine* | A |
| Nettles | *Urtica dioica* | A |
| Wood sorrel* | *Oxalis acetosella* | F |
| Wood sedge | *Carex sylvatica* | F |
| Garlic mustard | *Alliaria petiolata* | F |
| Doc sp. | *Rumex sp.* | F |
| Speedwell germander | Veronica chamaedrys | F |
| Bugle | *Ajuga reptans* | F |
| Bramble | *Rubus fruticosus* | F |
| Ground ivy | *Glechoma hederacea* | F |
| Tufted hair grass | *Deschampsia cespitosa* | F |
| Primrose* | *Primula vulgaris* | F |
| Red campion* | *Silene dioica* | F |
| Honeysuckle | *Lonicera periclymenum* | F |
| Creeping bent | *Agrostis stolonifera* | F |

| | | |
|---|---|---|
| Herb Robert | *Geranium robertianum* | F |
| False oat-grass | *Arrhenatherum elatius* | O |
| Yellow pimpernel* | *Lysimachia nemorum* | O |
| Thistle | *Cirsium vulgare* | O |
| Greater stitchwort | *Stellaria holostea* | O |
| Heath speedwell | *Veronica officinalis* | O |
| Fern | *Tracheophyta* | O |
| Pendulous sedge* | *Carex pendula* | O |
| Black bryony | *Dioscorea communis* | R |
| Pignut* | *Conopodium majus* | R |
| Soft brome | *Bromus hordeaceus* | R |
| Cocks foot | *Dactylis glomerata* | R |

* ancient woodland indicators as per The Wildflower Key (Rose et al., 2006) for east England

## Table 2: Lowland mixed deciduous woodland – HPI - Waldegrave Wood Ancient Woodland - w1f7-2

| Common name | Latin Name | Abundance |
|---|---|---|
| **Canopy layer** | | |
| Oak | *Quercus robur* | A |
| Hazel | *Corylus avellana* | F |
| Silver Birch | *Betula pendula* | F |
| Ash | *Fraxinus excelsior* | F |
| Aspen | *Populus tremuloides* | F |
| Blackthorn | *Prunus spinosa* | O |
| Wild cherry* | *Prunus avium* | O |
| Field maple | *Acer campestre* | R |
| **Ground flora** | | |
| Male fern* | *Dryopteris filix-mas* | A |
| Bluebell* | *Hyacinthoides non-scripta* | A |
| Foxglove* | *Digitalis purpurea* | F |
| Honeysuckle | *Lonicera periclymenum* | F |
| Bracken | *Pteridium aquilinum* | F |
| Bramble | *Rubus fruticosus* | F |
| Cleavers | *Galium aparine* | F |
| Wood sorrel* | *Oxalis acetosella* | F |
| Wood anemone* | *Anemone nemorosa* | F |

| | | |
|---|---|---|
| Speedwell germander | *Veronica chamaedrys* | F |
| Herb Robert | *Geranium robertianum* | F |
| Wood meadow grass* | *Poa nemoralis* | F |
| Rough meadow grass | *Poa trivialis* | F |
| Ground Ivy | *Glechoma hederacea* | F |
| Yellow pimpernel* | *Lysimachia nemorum* | O |
| Bugle | *Ajuga reptans* | O |
| Wood sedge* | *Carex sylvatica* | O |
| Pendulous sedge* | *Carex pendula* | O |
| Wood dock | *Rumex sanguineus* | O |
| Curled dock | *Rumex crispus* | O |
| Greater stitchwort | *Stellaria holostea* | O |
| Yorkshire fog | *Holcus lantus* | O |
| Creeping bent | *Agrostis stolonifera* | O |
| Garlic mustard | *Alliaria petiolata* | O |
| Tufted hair grass | *Deschampsia cespitosa* | R |
| Red campion* | *Silene dioica* | R |
| Black bryony | *Dioscorea communis* | R |

*Shows ancient woodland indicators as per The Wildflower Key (Rose et al., 2006) for east England

## Table 3: Other neutral grassland - parcel g3c-9 - Marginal grass between woodlands and arable

| Common name | Latin Name | Abundance |
|---|---|---|
| False oat grass | *Arrhenatherum elatius* | A |
| Cocks foot | *Dactylis glomerata* | A |
| Common bent | *Agrostis capillaris* | A |
| Dandelion | *Taraxacum officinale* | F |
| Soft brome | *Bromus hordeaceus* | F |
| Thistle | *Cirsium vulgare* | F |
| Yorkshire Fog | *Holcus lantus* | F |
| Dock sp. | *Rumex sp.* | F |
| Germander speedwell | *Veronica chamaedrys* | O |
| Ragwort | *Jacobaea vulgaris* | O |
| Heath speedwell | *Veronica officinalis* | O |
| Creeping buttercup | *Ranunculus repens* | O |

| | | |
|---|---|---|
| Perennial rye grass | *Lolium perenne* | O |
| Crested dog tail | *Cynosurus cristatus* | O |
| Birds foot trefoil | *Lotus corniculatus* | O |
| Common vetch | *Vicia sativa* | O |
| Goatsbeard | *Aruncus dioicus* | O |

## Table 4: Hedgerow (priority) - h2a-2 (H1) - Hedgerow between Butler's and Waldegrave woodlands

| Common name | Latin Name | Abundance |
|---|---|---|
| Hawthorn | *Crataegus monogyna* | F |
| Blackthorn | *Prunus spinosa* | F |
| Field maple | *Acer campestre* | F |
| Hazel | *Corylus avellana* | F |
| Dog rose | *Rosa canina* | O |
| Oak | *Quercus robur* | O |
| **Ground Flora** | | |
| False oat | *Arrhenatherum elatius* | F |
| Cocksfoot | *Dactylis Glomerata* | F |
| Ribwort plantain | *Plantago lanceolata* | O |
| Barron brome | *Bromus sterilis* | O |
| Yarrow | *Achillea millefolium* | O |
| Daisy | *Bellis perennis* | O |
| Bristly oxtongue | *Helminthotheca echioides* | R |
| Hedgerow Cranesbill | *Geranium pyrenaicum* | R |

## Table 5: Dry ditch - D9 – Dry ditch running adjacent and linking Butler's Wood and Waldegrave wood

| Common name | Latin Name | Abundance |
|---|---|---|
| False oat grass | *Arrhenatherum elatius* | F |
| Bramble | *Rubus fruticosus* | F |
| Cow parsley | *Anthriscus sylvestris* | F |
| Creeping Buttercup | *Ranunculus repens* | F |
| Cocks foot | *Dactylis glomerata* | F |

| | | |
|---|---|---|
| Broom | *Sarothamnus scoparius* | O |
| Rosebay willow herb | *Chamaenerion angustifolium* | O |
| Red campion | *Silene dioica* | O |

## Table 6: Line of trees – w1g6-2 - Along ditch D12 and part of Old Road

| Common name | Latin Name | Abundance |
|---|---|---|
| Oak | *Quercus robur* | F |
| Ash | *Fraxinus excelsior* | F |
| Field maple | *Acer campestre* | F |
| Blackthorn | *Prunus spinosa* | O |
| Grey Willow | *Salix cinerea* | O |

## Table 7: Hedgerows (priority) - h2a-5 (H2) and h2a-6 (H3) – north & south of Old Road

| Common name | Latin Name | Abundance |
|---|---|---|
| **Canopy layer** | | |
| Hawthorn | *Crataegus monogyna* | A |
| Field maple | *Acer campestre* | A |
| Hazel | *Corylus avellana* | A |
| Elder | *Sambucus nigra* | F |
| Ivy | *Hedera helix* | F |
| Dogwood | *Cornus sanguinea* | O |
| **Ground flora** | | |
| Cow parsley | *Anthriscus sylvestris* | F |
| Cocks foot | *Dactylis glomerata* | F |
| Common bent | *Agrostis capillaris* | F |
| False oat-grass | *Arrhenatherum elatius* | F |
| Creeping buttercup | *Ranunculus repens* | F |
| Nettles | *Urtica dioica* | O |
| Small flowered cranesbill | *Geranium pusillum* | O |
| Soft brome | *Bromus hordeaceus* | O |
| Germander speedwell | Veronica chamaedrys | O |
| Ragwort | *Jacobaea vulgaris* | O |
| Ribwort plantain | Plantago lanceolata | O |
| Greater stitchwort | *Stellaria holostea* | R |

## Table 8: Other broadleaved woodland - w1g7-1 – surrounding pond r1a6-2

| Common name | Latin Name | Abundance |
|---|---|---|
| **Canopy layer** | | |
| Crack willow | *Salix fragilis* | F |
| Hazel | *Corylus avellana* | F |
| Field maple | *Acer campestre* | F |
| Oak | *Quercus robur* | O |
| Hawthorn | *Crataegus monogyna* | O |
| **Ground flora** | | |
| Nettles | *Urtica dioica* | A |
| Cleavers | *Galium aparine* | F |

| | | |
|---|---|---|
| Meadow grass | *Poa annua* | O |
| Dog rose | *Rosa canina* | O |

# Annex 3: Habitat Condition Assessment

## 1. Grassland condition

| Habitat Description - Grassland |
|---|
| Includes both agricultural, recreational, amenity, road verges and semi-natural grassland types including Priority Habitat Grasslands on all soil types.<br>Will be dominated by grassland species with very little (if any) dwarf shrub, wetland or wooded species within the sward.<br>Will exist above and below the level of enclosure at all altitudes |

| | Habitat Parcel reference (see Figure A3.4) | |
|---|---|---|
| **Assessment Criteria** | **G3c-6** | **G3c-9** |
| The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward. | ✓ | ✓ |
| Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed. | x | ✓ |
| Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens. | x | ✓ |
| Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%. | ✓ | ✓ |
| There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species1 and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. | x | x |

| Habitat Quality | Assessment Criteria | Qualifying Habitat Parcels |
|---|---|---|
| Good | Passes 5 of 5 criteria | None |
| Moderate | Passes 3 or 4 of 5 criteria | G3c-9 |
| Poor | Passes 0, 1 or 2 of 5 criteria | G3c-6 |

# 2. Woodland condition

## Habitat Description - Woodland

Woodland is defined as vegetation dominated by trees more than 5 m high when mature, which forms a distinct, although sometimes open, canopy [areas of trees with a canopy greater than 20%]. This includes felled, young, or newly planted woodland.

There is no minimum size for areas of trees that have the definite characteristics and feel of a woodland and are managed as woodland.

Two broad woodland types are considered here:

- Broadleaved, mixed and yew woodland.
- Coniferous woodland.

It does not include scrub (see separate scrub condition assessment).

In England, native woodland is defined as woodland that is composed of at least 80% native tree species including 'naturalised species'. It is based on the England Woodland Biodiversity Group condition assessment for non SSSI woodlands.

Wood Pasture and Parkland

Wood pasture is a vegetation structure rather than a particular plant community. Typically, this structure consists of large, open-grown or high forest trees (often pollards) at various densities, in a matrix of grazed grassland, heathland and/or woodland floras.

This feature includes:

Wood pasture and parkland derived from medieval forests and embankments, wooded commons, parks and pastures with trees; and where the land use has been converted to arable, forestry or amenity, but where ancient trees are still present.

| | Score | | | Habitat Parcel reference (see Figure A3.4) | |
|---|---|---|---|---|---|
| **Indicator** | **Good (3 points)** | **Moderate (2 points)** | **Poor (1 point)** | **W1f7-1** | **W1f7-2** |
| **Age distribution of trees** | Three age classes present | Two age classes present | One age class present | 3 | 3 |
| **Wild, domestic and feral herbivore damage** | No significant browsing damage evident in woodland | Evidence of significant browsing pressure is present in 40% or less of whole woodland | Evidence of significant browsing pressure is present in 40% or more of whole woodland | 3 | 3 |
| **Invasive plant species** | No invasive species present in woodland | Rhododendron or laurel not present, other invasive species < 10% cover | Rhododendron or laurel present, or other invasive species > 10% cover | 3 | 2 |

| | Score | | | Habitat Parcel reference (see Figure A3.4) | |
|---|---|---|---|---|---|
| **Indicator** | **Good (3 points)** | **Moderate (2 points)** | **Poor (1 point)** | **W1f7-1** | **W1f7-2** |
| **Number of native tree species** | Five or more native tree or shrub species found across woodland parcel | Three to four native tree or shrub species found across woodland parcel | None to two native tree or shrub species across woodland parcel | 3 | 3 |
| **Cover of native tree and shrub species** | > 80% of canopy trees and >80% of understory shrubs are native | 50-80% of canopy trees and 50-80% of understory shrubs are native | < 50% of canopy trees and understory shrubs are native | 3 | 3 |
| **Open space within woodland** | 10 – 20% of woodland has areas of temporary open space, unless woodland is 10ha in which case lower threshold of <10% does not apply | 21- 40% of woodland has areas of temporary open space | More than 40% of woodland has areas of temporary open space | 3 | 3 |
| **Woodland regeneration** | All three classes present in woodland; trees 4- 7cm dbh, saplings and seedlings or advanced coppice regrowth | One or two classes only present in woodland | No classes or coppice regrowth present in woodland | 3 | 3 |
| **Tree health** | Tree mortality less than 10%, no pests or diseases and no crown dieback | 11% to 25% mortality and/or crown dieback or low risk pest or disease present | Greater than 25% tree mortality and or any high risk pest or disease present | 2 | 2 |
| **Vegetation and ground flora** | Ancient woodland flora indicators present | Recognisable NVC plant community present | No recognisable NVC community | 3 | 3 |
| **Woodland vertical structure** | Three or more storeys across all survey plots or a complex woodland | Two storeys across all survey plots | One or less storey across all survey plots | 2 | 2 |
| **Veteran trees** | Two or more veteran trees per hectare | One veteran tree per hectare | No veteran trees present in woodland | 2 | 2 |
| **Amount of deadwood** | 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps | Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps | Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps | 2 | 2 |
| **Woodland disturbance** | No nutrient enrichment or damaged ground evident | Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of | More than 1 hectare of nutrient enrichment and/or more than 20% of | 3 | 3 |

| | Score | | | Habitat Parcel reference (see Figure A3.4) | |
|---|---|---|---|---|---|
| **Indicator** | **Good (3 points)** | **Moderate (2 points)** | **Poor (1 point)** | **W1f7-1** | **W1f7-2** |
| | | woodland area has damaged ground | woodland area has damaged ground | | |
| **TOTAL SCORE** | - | - | - | 35 | 34 |

| Habitat Quality | Assessment Criteria | Qualifying Habitat Parcels |
|---|---|---|
| Good | Scores > 32 (33 to 39) | W1f7-1<br>W1f7-2 |
| Moderate | Scores 26 to 32 | None |
| Poor | Scores < 26 | None |

# 3. Line of trees condition assessment

| Habitat Description – Line of trees |
|---|
| A line of trees at least 20m in length with open habitat on each side. |

| Assessment Criteria | Habitat Parcel reference (see Figure A3.4) W1g6-2 |
|---|---|
| More than 70% of trees are native species | ✓ |
| Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5m wide | ✓ |
| Includes one or more mature or veteran tree | ✓ |
| There is an undisturbed naturally vegetated strip of at least 6 m on both sides to protect the line of trees from farming and other anthropogenic operations | x |
| At least 95% of the trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity | ✓ |

| Habitat Quality | Assessment Criteria | Qualifying Habitat Parcels |
|---|---|---|
| Good | Passes 5 of 5 criteria | None |
| Moderate | Passes 3 or 4 of 5 criteria | W1g6-2 |
| Poor | Passes 0, 1 or 2 of 5 criteria | None |

# 4. Hedgerow condition

| | | Habitat Parcel reference (see Figure A3.4) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Attributes and functional groupings** | **Criteria** | **H2a-2** | **H2a-4** | **H2a-5** | **H2a-6** | **H2a-7** | **H2a-10** | **H2a-12*** |
| A1. Height | >1.5 m average along length | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| A2. Width | >1.5 m average along length | ✓ | x | ✓ | ✓ | ✓ | ✓ | - |
| B1. Gap – hedge base | Gap between ground and base of canopy <0.5m for >90% of length (unless 'line of trees') | ✓ | x | ✓ | ✓ | x | ✓ | - |
| B2. Gap - hedge canopy continuity | Gaps make up <10% of total length<br>No canopy gaps >5 m | ✓ | ✓ | ✓ | ✓ | x | ✓ | - |
| C1. Undisturbed ground and perennial vegetation | >1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length measured from outer edge of hedgerow, and is present on one side of the hedge (at least) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| C2. Undesirable perennial vegetation | Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| D1. Invasive and neophyte species | >90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| D2. Current damage | >90% of the hedgerow or undisturbed ground is free of damage caused by human activities | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| | *Additional group - applicable to hedgerows with trees only:* | | | | | | | |
| E1. Tree age | At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is | x | N/A | ✓ | ✓ | x | ✓ | - |

| | | Habitat Parcel reference (see Figure A3.4) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Attributes and functional groupings** | **Criteria** | **H2a-2** | **H2a-4** | **H2a-5** | **H2a-6** | **H2a-7** | **H2a-10** | **H2a-12*** |
| | at least 2/3 expected fully mature height for the species | | | | | | | |
| E2. Tree health | At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity | ✓ | N/A | ✓ | ✓ | ✓ | ✓ | - |

*As per limitation section – h2a-12 has not been conditioned assessed in the field and as a precautionary measure given a condition of good based of aerial mapping, and nearby hedgerows in the area.

| Habitat Quality | Assessment Criteria | Qualifying Habitat Parcels |
|---|---|---|
| Condition categories for hedgerows without trees: | | |
| Good | No more than 2 failures in total;<br>AND No more than 1 in any functional group | H2a-4 |
| Moderate | No more than 4 failures in total;<br>AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & C2 = Moderate condition) | None |
| Poor | Fails a total of more than 4 attributes;<br>OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition) | None |
| Condition categories for hedgerows with trees: | | |
| Good | No more than 2 failures in total;<br>AND No more than 1 failure in any functional group | H2a-2<br>H2a-5<br>H2a-6<br>H2a-10<br>H2a-12 |
| Moderate | No more than 5 failures in total;<br>AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1, C2 & E1 = Moderate condition) | H2a-7 |
| Poor | Fails a total of more than 5 attributes;<br>OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition) | None |

# Annex 4: Bat Survey Results

Table 1 – PGLRA and tree climbing bat survey results

Table 2 – Bat emergence/ re-entry meta data

Table 3 – Roost analysis

## Table 1: Preliminary Ground Level Roost Assessment and tree climbing bat survey results

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| TC1 | TL 84222 37186 | Oak – 1.25 | PRF 1: Semi torn-out branch. Some cracks and rotting but nothing significant. Rotting bowl at base - low.<br>PRF 2: Same as 1) – low.<br>PRF 3: Trunk cavity at 6m, north-east facing. Entrance diameter is 8cm and feature extends diagonally upwards for 8cm. Feature also goes down 1cm. Internal diameter 10cm max., with dome-shaped apex. Woodlice inside with dirty, smooth and dry interior – moderate.<br>PRF 4: Minor lifted bark – negligible. | Moderate | No | N/A | Climbing inspection | No roost |
| TC2 | TL 84267 37188 | Ash – 0.75 (multi-stem) | PRF 1: Knothole / callus roll located 8m high on main stem. Entrance 3cm leading inwards 10 cm then narrowing to cone. Internal diameter 3cm. Interior was rough, dry and fairly clean – low.<br>PRF 2: Tear out feature - part of rotten heartwood, leaving small cavity. Feature leads 20cm inwards with the entrance measuring 2x3cm. Internal cavity was 3cm wide, dry, clean, smooth and sheltered. Good surrounding habitat – high. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC3 | TL 84317 37195 | Ash -1 | PRF 1: Entrance approx.7cm in diameter, extending 20cm inwards before tapering slightly. Rough and dirty inside with some decay forming a crevice that extends inwards by 5cm. Suitable for 1 or 2 bats - moderate.<br>PRF 2: Both have entrances 7cm in diameter. Both lead inwards 20cm without tapering without leading up or down. Both have nesting material in and are dry, smooth, and clean. Both are exposed to predation - low.<br>PRF 3: Entrance measures 7cm high and 3cm wide. Leads into gap behind rotting heartwood, leading | Moderate | Yes | Tree unsafe to climb – fungal brackets below feature | Climbing inspection | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| | | | 10cm up and 7cm inwards. Damp and rough inside with no interspecies competition – moderate. | | | | | |
| TC4 | TL 84344 37166 | Oak -0.9 | PRF 1: Small cavity in wound growth around limb tear out. Facing south-west, 10m high.<br>PRF 2: Two cavities on underside of northern aspect of tree Approx.16-18m high. | Moderate | No | N/A | Climbing inspection | No roost |
| TC5 | TL 84333 37166 | Oak – 0.75 | No suitable space/ insulation for bats following aerial inspection – negligible. | Negligible | No | N/A | Climbing inspection | No roost |
| TC6 | TL 84357 37145 | Oak – 0.9 | PRF 1: Wound growth around limb tear out potentially leading to cavity behind. Feature at 7m facing west. | Moderate | No | N/A | Climbing inspection | No roost |
| TC7 | TL 84359 37143 | Oak -1.1 | PRF 1: Crack on underside of torn branch on northern side of tree. South-west facing, approx.10m high. | Moderate | No | N/A | Climbing inspection | No roost |
| TC8 | TL 84367 37160 | Oak -0.8 | PRF 1: Wound growth around limb tear out potentially leading to cavity. Feature at 10m facing north-west. | Moderate | No | N/A | Climbing inspection | No roost |
| TC9 | TL 84398 37168 | Oak -0.9 | PRF 1: Rot hole at 7m facing north-east with dead, cracked branch 1m above. | Moderate | No | N/A | Climbing inspection | No roost |
| TC10 | TL 84414 37148 | Oak -0.8 | PRF 1: Branch cavity on fork, approx. 4m high facing south-east. | Moderate | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC11 | TL 84486 37164 | Oak -0.9 | PRF 1: Rot hole approx. 9m high facing south. Observed from south field. | Moderate | No | N/A | Climbing inspection | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| TC12 | TL 84512 37214 | Oak -1 | PRF 1: Tear out and cracks at base of dead branch at approx. 6m, facing south. Wounds are very open with no crevices. Damp and dirty inside with small amount of lifted bark – low.<br>PRF 2: Lifted bark open and exposed. Gap between bark and branch is 4cm. Extends 60cm along branch. Damp and dirty inside – low. | Low | No | N/A | Climbing inspection | No roost |
| TC13 | TL 84557 37199 | Oak -1.25 | PRF 1: Feature measures15x3cm, heartwood is desiccated with cavity inside leading in 10cm. Cavity is quite sheltered, dry and suitable for a single bat – moderate.<br>PRF 2: Tightly sealed, small cavity measuring 1x2cm. Full of woodlice and facing south – negative.<br>PRF 3: Branch cavity at approx. 8m facing south-west. Entrance measures 12x4cm with internal 2cm cavity. Interior is dirty and full of debris. Leads horizontally towards stem for 10cm – low. | Moderate | No | N/A | Climbing inspection | No roost |
| TC14 | TL 84581 37197 | Oak -1 | PRF 1: Tear out is approx.1m high and 40cm wide. Cavity at the top goes in 10cm with entrance 3x7cm. Internal is similar dimensions. Sheltered, dry, dirty – moderate.<br>PRF 2: Knot hole with peg on branch at approx. 6m extending over field to the south. Opens into crack running along top of branch. Crack is 3cm wide and 3cm deep. Open and exposed all the way along – low. | Moderate | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC15 | TL 84599 37211 | Ash -1.1 | PRF 1: Entrance faces downward and is 6cm in diameter. Internal diameter is 6cm and leads towards stem. Clean and smooth interior leading inwards 15cm No competitors – high.<br>PRF 2: Entrance measures 3x3cm in diameter leading into longer cavity. Extends 20cm into trunk. Fairly damp and dirty interior but suitable space - moderate. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| | | | PRF 3: Open and exposed with some crevices but no suitable space or insulation – low. | | | | | |
| TC16 | TL 84630 37199 | Oak -1.2 | PRF 1: Entrance 5cm diameter leading back 20cm. Internal diameter 5cm. Interior is dry with low levels of dirt, cobwebs and woodlice. Rough and bumpy interior - moderate.<br>PRF 2: Entrance measures 10x4c with internal diameter of 5cm. Leads back 15cm and is dry, dirty, full of debris and cobwebs – moderate. | Moderate | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC17 | TL 84652 37164 | Oak -1 | PRF 1: Open and exposed. Entrance 12x12cm leading back 25cm – low. | Low | No | N/A | N/A | No roost |
| TC19 | TL 84457 37025 | Oak -0.75 | PRF 1: Tear out with heartwood in wound. Cavity in heartwood with top entrance measuring 5cm in diameter. Goes diagonally upwards and interior is clean, dry, smooth with a few woodlice. Feature narrows and goes up 40cm– high.<br>PRF 2: Second entrance 50cm lower facing north. Entrance measures 5x3cm and narrows to dome apex 20cm up. Internal diameter measures 6cm, is sheltered and has few cobwebs – high. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC20 | TL 84405 37036 | Oak -0.7 | PRF 1: Superficial only – does not lead anywhere – negligible<br>PRF 2: Superficial only – does not lead anywhere – negligible | Negligible | N/A | N/A | Climbing inspection | No roost |
| TC21 | TL 84371 37026 | Oak -0.8 | PRF 1: Tear out is 2.5m long and 30cm wide. Calluses around edges do not have roosting potential. Small vertical cracks in exposed heartwood are superficial. Top of feature is open and exposed. Rough, clean and dry interior – low. | Low | No | N/A | N/A | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| TC22 | TL 84330 37042 | Oak -0.9 | PRF 1: Knot hole10x4cm is completely open. Goes inwards by 5cm and is exposed – low.<br>PRF 2: More of a bird nesting feature - no animals present. Entrance 15x10cm, secondary entrance 5cm diameter. Bowl inside - too open for bats. Goes in 30cm. straw at base with few cobwebs. Cavity goes up 10cm and is suitable for a small number of bats – moderate. | Moderate | No | N/A | Climbing inspection | No roost |
| TC23 | TL 84310 37044 | Oak -0.5 | PRF 1: Entrance measures 4x10cm at bottom of feature. Goes up 35cm inside. Very dirty and rough inside. Internal width 12cm and depth 3cm – moderate.<br>PRF 2: Second cavity at top of heartwood panel. Entrance measures 10x4cm. Goes up into main trunk of tree by 60cm. Internal diameter measures 6cm all the way up. Dry, fairly clean with no competitors – high. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC24 | TL 84289 37036 | Oak -1.1 | PRF 1: Wound is 60x15cm. No crevices behind exposed heartwood. Cavity at top left of feature which has a 3cm diameter entrance and goes in 6cm. Sheltered, dry and clean interior – moderate. | Moderate | No | N/A | Climbing inspection | No roost |
| TC25 | TL 84259 37032 | Ash -0.6 | PRF 1: Entrance 40cm high, 5cm wide. Cavity on southern side extends upwards into southern stem. Internal diameter 4cm goes up 30cm. Damp inside, secure and sheltered, smooth and mostly clean - high.<br>PRF 2: Knot hole facing south. Entrance 6cm in diameter extending 25cm inside trunk. Interior damp with some sludge but no competitors – moderate. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC26 | TL 84259 37028 | Oak -0.5 | PRF 1: Entrance measures 6cm in diameter and leads inwards 10cm before tapering slightly. Doesn't go up or down with interior rough and dry – low. | Low | No | N/A | N/A | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| TC27 | TL 84257 36963 | Oak -0.8 | PRF 1: Rim of entrance smooth possibly from mammal use. Bowl shaped cavity full of sludge and slugs. Damp, wet and dirty interior. Entrance measures 7cm in diameter extending back 20cm. Internal diameter measures 10cm – low.<br>PRF 2: Ants nest inside. Crevice at back of wound is 7x2cm leading inwards 7cm. Dry and sheltered with lots of debris and dirt – moderate.<br>PRF 3: Entrance measures 15x12cm leading inwards 20cm and diagonally downwards. Rough and dirty interior with peg of old branch sticking out – low. | Confirmed – 2-3 myotis found with endo | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | Roost identified – 2-3 Natterer's bat (Myotis nattereri) confirmed by DNA of droppings – day roost |
| TC28 | TL 84274 36944 | Oak -0.9 | PRF 1: No suitable space or insulation – negative.<br>PRF 2: Crevices and deadwood in limb with loose bark at same height as callous roll. Main part is hollowed out. Cavity entrance is 5x4cm leading inwards 10cm into a wedge leading upwards by 10cm. Clean, sheltered and dry interior with some debris - moderate.<br>PRF 3: Branch facing east with cavity on top extending along branch 5m. Entrance not visible, but measures 20x10cm. Internal diameter measures 9cm. Interior is clean and smooth with debris at entrance before tapering tapers to end (approx. 70 cm) – high. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |
| TC29 | TL 84318 36817 | Ash -0.6 | PRF 1: Woodpecker hole at top of wound feature at 9m, on eastern aspect of main stem. Entrance measures 7cm and opens out into cavern in centre of tree. Internal diameter widens to 10cm. It goes back 20cm. Bird nesting material in base. Rough, dry, clean with woodlice. Two crevices at back on top could be suitable for a bat – moderate.<br>PRF 2: Callus roll on main stem, no potential – negative. | Moderate | Yes | Squirrels present. No change to PRFs from previous inspection, no bats recorded. | Climbing inspection | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| TC32 | TL 84260 36974 | Oak -0.8 | PRF 1: Woodpecker hole at 4m, facing north on main stem. Entrance measures 8cm in diameter. Opens out into large cavity. Bird nesting material in base (old). Goes back 30cm. Internal diameter 15cm. Rough, clean, dry. Goes up 20cm, tapering to spire. Dry, sheltered – high.<br>PRF 2: Woodpecker hole at 6m, facing north-west on main stem. Entrance measures 5cm in diameter and goes in 15cm. Internal diameter measures 6cm. Dry, dusty, cobwebs. Goes up 2cm – moderate. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | | No roost |
| TC33 | TL 84259 37034 | Oak -0.5 | PRF 1: Knot hole at 4m on main stem facing north west Entrance measures 4cm wide and goes in 8cm. Feature doesn't extend down. Crevices at top and right that go up 5cm. Clean, dry, sheltered. Room for 2 or 3 bats. Uncluttered drop zone – moderate. | Moderate | No | N/A | Climbing inspection | No roost |
| T1 | TL 84267 37214 | Ash - 1.2 | PRF 1: Cavity tapers to spire at apex. Internal diameter 25cm. Damp inside with debris, fresh cobwebs and bobbly sides. Reasonably clean with some debris. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |
| T2 | TL 84322 37179 | Ash -0.7 | PRF 1: Open trunk cavity (frost crack) running from ground level up to 6m where it seems to extend into sheltered internal cavity for at least 20cm. | N/A | Yes | No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |
| T3 | TL 84566 37200 | Oak (dead tree) -0.8 | PRF 1: Multiple woodpecker holes facing south-west at 5m. | N/A | No | N/A | Emergence/re-entry | No roost |
| T4 | TL 84555 37029 | Ash -1.5 (multi-stem) | PRF1: 4 stems, eastern stem goes up extensively and so does the northern stem. Eastern and northern stem goes up at least 1 m, some debris and dirty and damp, narrows as it goes up. Internal dimensions 20 cm at base. | High | Yes | No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| T5 | TL 84498 37026 | Ash -0.8 | PRF 1: Splits and raised bark on all aspects starting from 1m. Diseased tree. | N/A | No | N/A | Emergence/re-entry | No roost |
| T6 | TL 84448 37017 | Likely oak (dead tree) -0.8 | PRF 1: Loose bark on all aspects.<br>PRF 2: Large opening on tree facing east. | N/A | Yes | Unsafe to climb – bark torched from ground level. No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |
| T7 | TL 84370 37017 | Likely oak (dead tree) – 0.8 | PRF 1: Entrance measures 30x10cm. Open cavity with some shelter behind callous rolls - low.<br>PRF 2: Cavity on west facing limb at 9m. Knot hole leads to crevice at back. Entrance measures 10x7cm and extends back 6cm and down by 2cm. Interior is rough, dry, open and with debris – low.<br>PRF 3: Central dead stem at 8m with multiple entrances on all aspects. Hollow inside but open and exposed at top - low.<br>PRF 4: Knot hole at 7.5m facing south-east. Entrance measures 8x6cm and has a chimney that extends up by10cm. Interior is sheltered and dry – moderate.<br>PRF 5: Wound in upright limb at 7m facing south-east. Feature extends 10x8cm and goes up by 40 cm. Interior is rough, clean, dry and with cobwebs. Extends down by 2cm, with some decay at base - high.<br>PRF 6: Knothole entrance measuring 9x9cm, approx. 5m high and facing south-east. Internal diameter measures 15cm and goes diagonally upwards by 80cm. Interior is smooth, clean and dry – high.<br>PRF 7: Knot hole entrance measuring 9x9cm. Walls clean, sawdust in base extending upwards. Internal | High | Yes | Unsafe to climb – bark torched from ground level. No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |

| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| | | | diameter measures 15cm before narrowing. Multiple chambers at top, clean and dry – high. | | | | | |
| T8 | TL 84309 37039 | Oak -0.6 | PRF1: Disease in trunk leading to numerous large cavities from 2m up to 7m facing west.<br>PRF2: Rot hole facing north-west at 7m. | N/A | Yes | Unsafe to climb | Emergence/re-entry | No roost |
| T9 | TL 84273 37002 | Oak -0.6 | PRF1: Large hollow base, dry inside, smooth, goes upwards 2 m. The top 50 cm is dirty and damp. The lower part is dry. Entrance and internal - 20 cm diameter. | High | Yes | Unsafe to climb –inspection from ground level. No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |
| T10 | TL 84280 36910 | Likely oak (dead tree) -1 | PRF1: Dead tree with loose bark on trunk and branches - starting from 2m facing west. | N/A | Yes | Unsafe to climb –inspected from ground level. No change to PRFs from previous inspection, no bats recorded. | Emergence/re-entry | No roost |
| T11 | TL 84260 36909 | Ash -0.5 | PRF1: Woodpecker hole at 12m on eastern side.<br>PRF2: Cavity in branch on south-western side at 12m. | N/A | No | N/A | Emergence/re-entry | No roost |
| T12 | TL 84287 36835 | Oak -1.1 | PRF1: Callus roll in dead branch facing west. | N/A | No | N/A | Emergence/re-entry | No roost |
| T13 | TL 84296 36824 | Oak -1 | PRF1: Dead, rotten tree with numerous woodpecker and rot holes facing north at 5m. Loose bark on all aspects. | N/A | Yes | Unsafe to climb –inspected from ground level. No change to PRFs from previous | Emergence/re-entry | No roost |

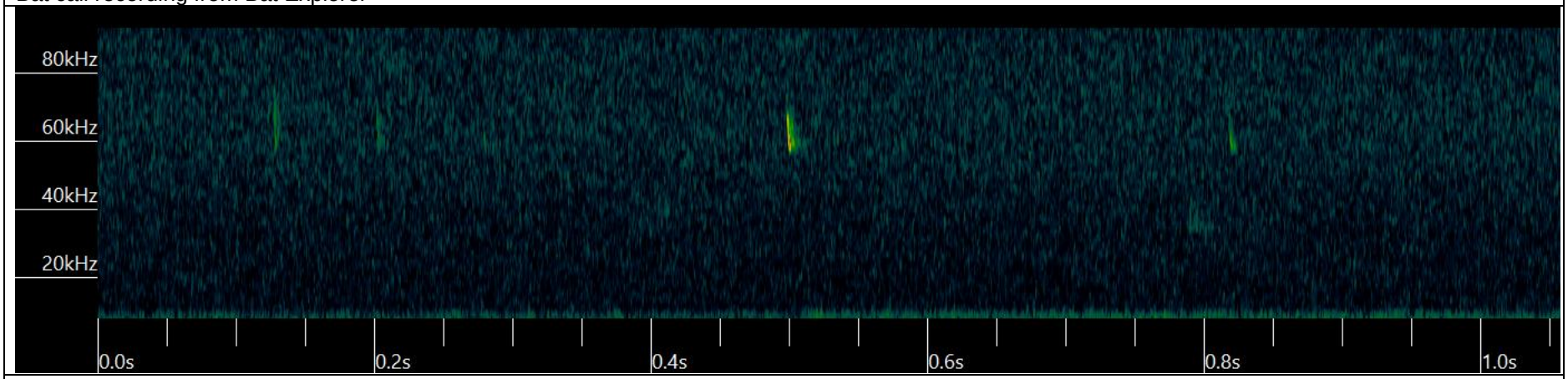
| Tree ID | OS Grid Ref | Species & DBH (m) | Potential Roost Feature | Roost Potential suitability | Hibernation potential | Hibernation survey results | Active Season survey method | Roost |
|---|---|---|---|---|---|---|---|---|
| | | | | | | inspection, no bats recorded. | | |
| T15 | TL 84315 36792 | Aspen - 0.4 | PRF1: Three woodpecker holes on western side of tree and approx. 10-12m. | N/A | No | N/A | Emergence/re-entry | No roost |

## Table 2: Emergence and re-entry survey metadata

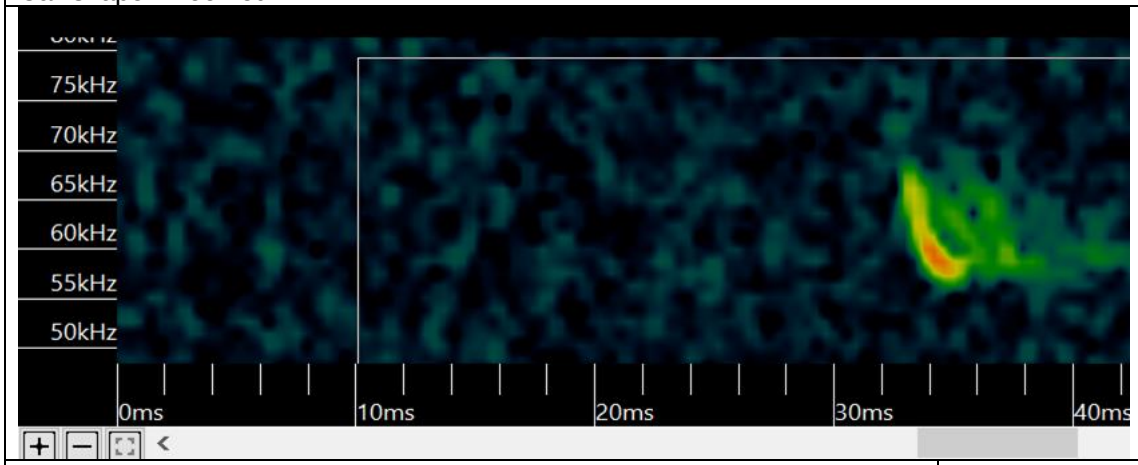
| Date | Trees Surveyed | Visit Number | Survey type | Sunset/sunrise time | Survey start time | Survey end time | Temperature (ºC) | Rain (1-4) | Wind (Beaufort) | Cloud cover (0-8) |
|---|---|---|---|---|---|---|---|---|---|---|
| 04-08-21 | T4, T7-9 | 1/3 | Dawn | 05:23 | 03:23 | 05:38 | 9-11 | 1 | 0 | 0 |
| 05-08-21 | T1-2 | T1,  T2 - 1/3 | Dawn | 05:24 | 03:23 | 05:39 | 11-12 | 1 | 0 | 5 |
| 24-08-21 | T6-9 | T6 – 1/2<br>T7 – 2/3<br>T8, T9 – 2/3 | Dawn | 05:55 | 03:55 | 06:10 | 12 | 1 | 1 | 6 |
| 25-08-21 | T1-5 | T1, T2, T4 – 2/3<br>T3, T5 – 1/2 | Dusk | 19:59 | 19:20 | 19:44 | 16 | 1 | 2 | 7 |
| 26-08-21 | T10-11 | 1/2 | Dusk | 19:57 | 19:42 | 21:57 | 14 | 1 | 3 | 8 |
| 21-09-21 | T1-3 | T1, T2 – 3/3<br>T3 – 2/2 | Dawn | 06:41 | 04:41 | 06:56 | 13-14 | 1 | 1 | 4 |
| 22-09-21 | T10-11 | 2/2 | Dawn | 06:42 | 04:42 | 06:57 | 11-14 | 1 | 1 | 0 |
| 28-09-21 | T4-5 | T4 – 3/3<br>T5 – 2/2 | Dawn | 06:53 | 04:53 | 07:08 | 10 | 1 | 1 | 2 |

## Table 3: Roost analysis of bat recorded during dusk survey on T16 – sound call

Bat call recording from Bat Explorer

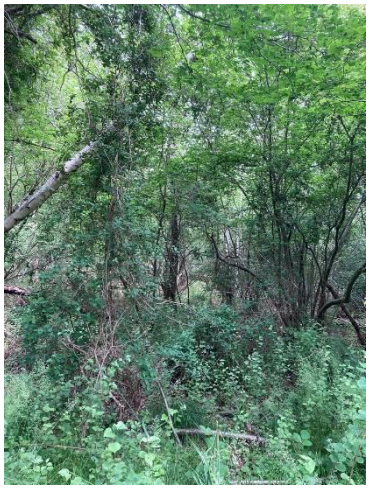



Call shape – zoomed in




| | |
|---|---|
| Species | Soprano pipistrelle |
| Time/Date | 20:23 on 23rd September 2021 |
| Peak frequency | 57.6 kHz |
| Max frequency / Min frequency | 67.8 kHz / 57 kHz |

# Annex 5 Photos of Habitats and Ecological Features

| Woodland Habitat – Ancient and Broadleaved | |
|---|---|
|  <br>*Photograph 1: Butler's Wood ancient woodland adjacent to A131 (Parcel no. w1f7-1).* |  <br>*Photograph 2: Butler's Wood ancient woodland adjacent to A131 (Parcel no. w1f7-1).* |
|  <br>*Photograph 3: Butler's Wood ancient woodland adjacent to A131 (Parcel no. w1f7-1).* |  <br>*Photograph 4: Northern edge of Waldegrave Wood ancient woodland (Parcel no. w1f7-2).* |
|  <br>*Photograph 5: Western edge of Waldegrave Wood ancient woodland (Parcel no. w1f7-2).* |  <br>*Photograph 6: Waldegrave Wood ancient woodland understory composition (Parcel no. w1f7-2).* |

*Photograph 7: Waldegrave Wood ancient woodland understory composition (Parcel no. w1f7-2).*

*Photograph 8: Broadleaved woodland around Pond 7, east of A131 (Parcel no. w1g7-1).*

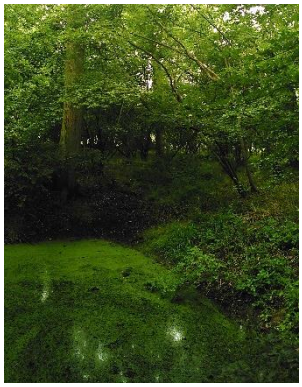
*Photograph 9: Mature multi-stem willow tree within broadleaved woodland surrounding Pond 7, east of A131 (Parcel no. w1g7-1).*

*Photograph 10: Broadleaved woodland adjacent to Pond 18 located south of the scheme (Parcel no. w1g7-2).*

| Grassland Habitat – Amenity, Neutral and Grazed | |
|---|---|
|  <br>*Photograph 11: Grazed grassland (Parcel no. g3c-1).* |  <br>*Photograph 12: Grass Margin adjacent to arable field (Parcel no. g3c-3).* |
|  <br>*Photograph 13: Grass Margin running parallel to line of trees (Parcel no. g3c-8).* |  <br>*Photograph 14: Grassland road verge (Parcel no. g3c-6).* |
|  <br>*Photograph 15: Neutral Grassland (Parcel no. g3c-4).* |  <br>*Photograph 16: Amenity Grassland (Parcel no. g4-2).* |

| Field Boundaries - Hedgerows and Lines of Trees | |
|---|---|
|  <br>*Photograph 17: Line of planted poplar trees south of Old Road and adjacent to intensive orchards (Parcel no: w1g6-6)* |  <br>*Photograph 18: Hedgerow with trees north of Old Road (Parcel no: h2a-1)* |
|  <br>*Photograph 19: Line of trees adjacent to track north of Lodge Farm. (Parcel no: w1g6-11)* |  <br>*Photograph 20: Line of trees/mature hedgerow running along the edge of the Scout Campgrounds, east of A131. (Parcel no: w1g6-11)* |
|  <br>*Photograph 21: Hedgerow along Old Road just east of A131 and south of Waldegrave Wood. (Parcel no: h2a-5 and H2)* |  <br>*Photograph 22: Line of Lime Trees in the south-western corner of the scheme leading to Stone's Farm. (Parcel no: w1g6-4 & w1g6-5)* |

*Photograph 23: Intact Hedgerow along A131 in between Butler's Wood and Waldegrave Wood.*

| Ponds – Positive GCN Presence | |
|---|---|
|  *Photograph 24: P3 situated in the north-west corner of Butler's Wood.* |  *Photograph 25: P4 situated in the north-west corner of Butler's Wood.* |
|  *Photograph 26: P5 situated on the southern side of Butler's Wood.* |  *Photograph 27: P6 situated on the southern side of Butler's Wood.* |
|  *Photograph 28: P14 situated on Old Road just north of Nether House Farm.* |  *Photograph 29: P20 situated in the south-western corner of the scheme.* |

| Ecological Constraints – Bats, Badgers and Invasive Species | |
|---|---|
|  <br>*Photograph 30: T16 Confirmed Bat Roost located in the south-western corner of Waldegrave Wood.* |  <br>*Photograph 31: Infra-Red Camera Footage of Soprano Pipistrelle perching outside bat roost feature on T16.* |
|  <br>*Photograph 32: Tree C27 Confirmed Bat Roost located in Waldegrave Wood.* |  <br>*Photograph 33: Active badger sett entrance located along southern edge of Butler's Wood.* |
|  <br>*Photograph 34: Outlier badger sett entrance located along western edge of Butler's Wood.* |  <br>*Photograph 35: Mammal path leading to outlier badger sett located along western edge of Butler's Wood.* |

*Photograph 36: Disused outlier badger sett. Two entrances located within small broadleaved woodland surrounding Pond 7.*

*Photograph 37: Two badger latrines located within Scout Campgrounds east of A131.*

*Photograph 38: Annex/Subsidiary badger sett entrance facing SE within pile of debris located on Scout Campgrounds.*

*Photograph 39: One of three entrances to outlier badger sett located along arable field margin north-east of Scout campgrounds.*

*Photograph 40: Main badger sett with 18 active entrances located along a hedgerow north-east of Lodge Farm.*

*Photograph 41: Outlier badger sett entrance at base of a mature oak tree located along a hedgerow north-east of Lodge Farm.*

*Photograph 42: Main badger sett with 10 entrances located in line of trees on bank situated east of Nether House Farm.*

*Photograph 43: Main badger sett with 10 entrances located in line of trees on bank situated east of Nether House Farm.*

*Photo 44: Variegated Yellow Archangel located within Waldegrave Wood*

*Photo 45: Variegated Yellow Archangel located within grassland surrounding Scout Campgrounds*

National Grid plc
National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152

**nationalgrid.com**